HELIX Environmental Planning

Camino Del Mar Bridge Replacement Project

Final Initial Study/ Mitigated Negative Declaration

February 2023 | 01391.00002.002

Prepared for:

City of Del Mar
Planning Department
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Del Mar, CA 92014

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Preface

This document has been prepared under the California Environmental Quality Act (CEQA) by the City of Del Mar (City) as the lead agency. This document constitutes the Camino Del Mar Bridge Replacement Project (project) Final Initial Study/Mitigated Negative Declaration (IS/MND). The document title has been updated to reflect that status.

A Notice of Intent to adopt an MND for the project was published in the Del Mar Times on May 5, 2022. The Draft MND was submitted to the State Clearinghouse (SCH) and the Governor's Office of Planning and Research (OPR) and circulated for a 30-day public review period beginning on May 5, 2022, and ending on June 3, 2022 (SCH No. 2022050089). A total of five comment letters were received during the public comment period, including three letters from public agencies and two from individuals. The City has prepared responses to the comments received and both the letters and responses are included in the Final MND as Appendix K, Public Comment Letters and Responses.

Following the public review period of the Draft MND, clarifications and corrections were incorporated into the Final MND in response to public comments received or the City's desire to clarify a matter. In addition, an engineering review of the completed technical studies and coordination with the California Department of Transportation (Caltrans) resulted in the extension of the construction duration from 27 to 36 months. A 36-month construction duration would provide additional flexibility for the contractor and would require up to 14 temporary nighttime closures of the Camino del Mar roadway (compared to the 12 temporary nighttime closures identified in the Public Review Draft MND). A summary of the change in duration for each proposed construction phase is presented in the table below:

Construction Stage	Description	Public Review Draft MND Construction Duration (months)	Final Draft MND Construction Duration (months)
Stage 1	Site preparation and mobilization	2	3
Stage 2	East side existing bridge demolition and construction of the eastern half of the new bridge	10	14
Stage 3	West side existing bridge demolition and construction of the western half of the new bridge	10	14
Stage 4	Bridge median improvements	3	3
Stage 5	Final improvements and demobilization	2	2

Key revisions are identified and summarized in the table below. Text changes in the Final MND are indicated by strikeout (deleted) and underline (inserted) markings, including a line in the margin next to the modified text. Note that some minor text changes (e.g., typographical corrections) are not reflected in this table or in underlined format of the Final MND.

No new information has been presented in the Final IS/MND that would require recirculation of the Draft IS/MND pursuant to CEQA Guidelines Section 15088.5(a). Specifically, no new significant environmental impacts would result from the project or from new mitigation measures proposed for implementation. The Draft IS/MND included adequate information for a meaningful public review and comment.

The Final IS/MND also includes the Mitigation Monitoring and Reporting Program, included as Appendix L.

Summary of Key Revisions to the Final MND

Location in the Final MND	Description of Change
Throughout Final MND	Previous references to a construction duration of 27 months have been changed to 36 months. Previous references to 12 temporary nighttime closures of the Camino del Mar roadway have been changed to up to 14 closures.
Section 1.1, Construction Methods and Phasing	In response to the California State Lands Commission letter, additional information regarding construction methodology and Best Management Practices has been added.
Section 1.10, Other public agencies whose approval is required	Clarification has been added to indicate that a new or amended Lease Agreement would be obtained by the California State Lands Commission, since there is an existing lease that was issued to the City for the bridge right-of-way in June 2000 (Lease No. PRC 8181.9).
Section 2.III, Air Quality	Introductory language added to describe the change in construction duration from 27 to 36 months and how the extended construction schedule would result in reduced emissions compared to what was evaluated in the Draft Air Quality and Greenhouse Gas Assessment Letter.
Section 2.IV(a), Special Status Plant Species and Special Status Animal Species	Information has been added based on updated biological surveys and confirmation that endangered aquatic species would not be expected to occur in the project area.
Section 2.IV(a), Mitigation Measure BIO-1	Mitigation measure has been revised to require pre-construction surveys within one year of construction to account for the time that may be needed to obtain an Incidental Take Permit prior to construction, as well as correcting the start of the breeding season for Belding's savannah sparrow from February 15 to March 15.
Section 2.IV(a), Mitigation Measure BIO-3	Mitigation measure has been revised to provide additional clarification on the provision of buffer zones for avoidance of active nests during construction.
Section 2.IV(b), Paragraph One of Page 31	Section has been modified to remove construction details that are now located in Section 1.1 as described above.

Location in the Final MND	Description of Change
Section 2.IV(b), Mitigation Measure BIO-4	In response to the California Department of Fish and Wildlife (CDFW) letter, a statement has been added to ensure the habitat restoration plan will be submitted to CDFW for review. Mitigation proposed outside of the Coastal Zone shall require approval by the City, California Coastal Commission, and other agencies such as CDFW.
Section 2.IV(b), Table 6 and associated text	Total impacts to potentially jurisdictional aquatic resources corrected based on individual habitat type impacts that were correctly identified.
Section 2.IV(d), Migratory Wildlife Corridors	Section has been updated with additional information related to aquatic species and construction methodology as described above and in Sections 2.IV(a) and 1.1, respectively.
Section 2.V, Discussion	In response to the California State Lands Commission letter, information has been added detailing their jurisdiction over all cultural resources on or within the tide and submerged lands.
Section 2.V(b), Mitigation Measure CUL-1	In response to the California State Lands Commission letter, information has been added to the mitigation measure to require approval of final disposition of resources recovered on State lands under their jurisdiction.
Section VIII, Greenhouse Gas Emissions	Introductory language added to describe the change in construction duration from 27 to 36 months and how the extended construction schedule would result in reduced emissions compared to what was evaluated in the Draft Air Quality and Greenhouse Gas Assessment Letter.
Section 2.XXI(a), Biological Resources	Total impacts to potentially jurisdictional aquatic resources corrected based on individual habitat type impacts that were correctly identified, as noted above for Section 2.IV(b), Table 6 and associated text.

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Acronyms and Abbreviations

AB	Assembly Bill
ACMs	asbestos containing materials
ADL	aerially deposited lead
APE	Area of Potential Effects
BMPs	best management practices
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California Department of Forestry and Fire Protection
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CDP	coastal development permit
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CH_4	methane
CIA	Community Impact Assessment
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
DMFD	City of Del Mar Fire Department
DMMC	Del Mar Municipal Code
DOC	California Department of Conservation
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
EA	Environmental Assessment
EO	Executive Order

Acronyms and Abbreviations (cont.)

FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Authority
FW	Floodway
GHG	greenhouse gas
HELIX	HELIX Environmental Planning, Inc.
HFC	hydrofluorocarbons
JPA	Joint Powers Authority
KV	key view
LBP	lead based paint
LCP	Local Coastal Program
L_{EQ}	Noise Equivalent Level
LOSSAN	Los Angeles–San Diego–San Luis Obispo
L-OZ	Lagoon Overlay Zone
LUP	Land Use Plan
MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendant
MRZ	mineral resource zone
MSCP	Multiple Species Conservation Program
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NAHC	Native American Heritage Commission
NCTD	North County Transit District
NEPA	National Environmental Protection Act
NESMI	Natural Environment Study (Minimal Impacts)
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSLU	noise-sensitive land use
Pb	lead
PFC	perfluorocarbons
PM	particulate matter

Acronyms and Abbreviations (cont.)

RCNM	Roadway Construction Noise Model
ROG	reactive organic gases
RTIP	Regional Transportation Improvement Program
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCIC	South Coastal Information Center
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
SDG&E	San Diego Gas & Electric
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
TACs	toxic air contaminants
T-BACT	Toxics-Best Available Control Technology
TCP	Traffic Control Plan
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMT	vehicle miles traveled
VHFHSZ	very high fire hazard severity zone
WSE	water surface elevation

1.0 Introduction

1.1 Initial Study Information Sheet

1.	Project title:	Camino Del Mar Bridge Replacement
2.	Lead agency name and address:	City of Del Mar 1050 Camino del Mar Del Mar, CA 92014
3.	Contact person and phone number:	Joe Bride, Public Works Director/City Engineer 858-755-3294
4.	Project location:	Within the City of Del Mar along Camino del Mar (see Figures 1 through 3)
5.	Project sponsor's name and address:	Same as the lead agency
6.	Community plan designation:	N/A
7.	Zoning:	N/A

8. Description of project:

Overview

The City of Del Mar (City), using Federal Highway Administration (FHWA) funds, is proposing to replace the existing Camino del Mar Bridge (Bridge No. 57C-0209; bridge) over the San Dieguito Lagoon (lagoon), in the northwestern part of the City (see Figure 1, *Regional Location*; Figure 2, *Project Location*; and Figure 3, *Project Location – USGS*). The City is the California Environmental Quality Act (CEQA) lead agency. The California Department of Transportation (Caltrans), as the National Environmental Policy Act (NEPA) lead agency, is responsible for environmental review, consultation, and other actions required in accordance with applicable federal laws under its assumption of NEPA responsibility pursuant to 23 United States Code (U.S.C.) 327.

The bridge was determined in 2010 to be eligible for rehabilitation funding under the Highway Bridge Program but was later determined to be structurally deficient upon preparation of a Final Rehabilitation Strategy Report in 2012. The Camino Del Mar Bridge Replacement Project (project) involves the replacement of the Camino del Mar Bridge to provide for continued vehicle, pedestrian, and bicycle movement along Camino del Mar as it crosses the lagoon, as well as coastal access to Del Mar Beach.

The proposed bridge design consists of a five-span cast-in-place prestressed concrete box girder bridge. The variable depth bridge has a length of 624 feet between abutments, a width of 68.5 feet, and an area of about 41,800 square feet (0.96 acre). The proposed horizontal roadway alignment for Camino del Mar closely matches the existing horizontal alignment. The replacement bridge would be slightly longer, wider, and higher than the existing bridge; and would result in a reduction in the number of piers in the lagoon. The additional bridge width of 7.5 feet would accommodate two-way pedestrian and bicycle movement across the bridge. The roadway approach zones within Camino del Mar would also require

modifications to accommodate the raised elevation of the bridge, including reconstructing the sidewalks to meet the proposed pedestrian sidewalks on both sides of the replacement bridge. The proposed bridge width better aligns with the southerly and northerly approaches; the sidewalk on the east side of the bridge would connect the missing sidewalk gap within the existing bridge design. There would be no change in vehicle capacity as the existing two-lane Camino del Mar roadway would continue to provide one vehicle traffic lane in each direction.

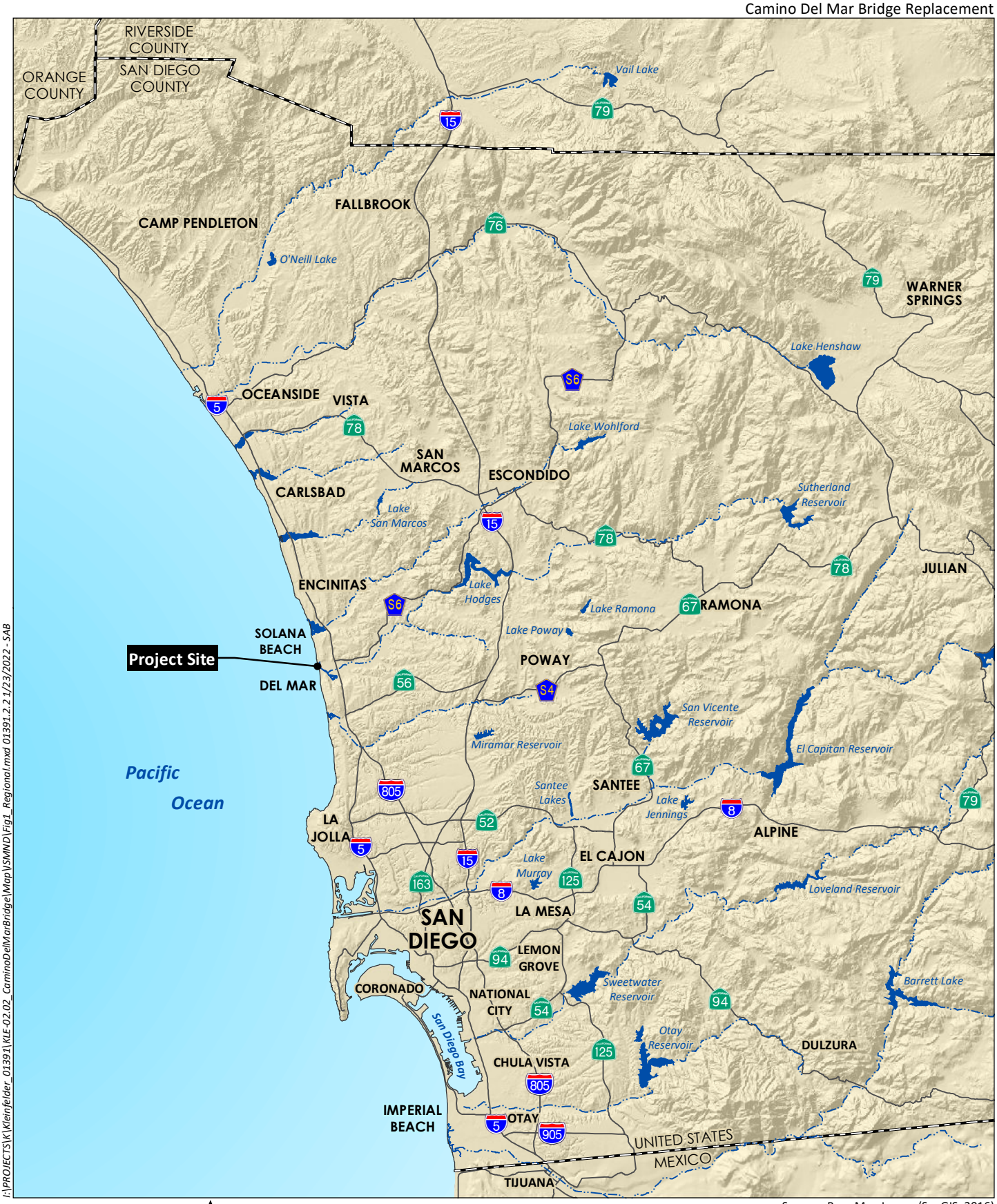
The proposed additional 28 feet, 2 inches in bridge length and additional 7.7 feet in bridge height near the center of the bridge would accommodate a mid-range sea level rise scenario of 38 inches by the year 2100 during a 100-year flood event (National Research Council 2012), while maintaining safe roadway design and avoiding roadway conflicts with driveways and coastal access points. As part of the preliminary design process, other sea level rise scenarios (e.g., Ocean Protection Council State Guidance) were evaluated to determine the appropriate bridge height. An increased water surface elevation of 38 inches, corresponding to the National Research Council mid-range sea level rise scenario for 2100, is the highest elevation where the bridge remains partially useable (in service) during a 100-year flood event. In scenarios where the projected sea level rise exceeds an increased water surface elevation of 38 inches, the bridge would cease to be connected to a functional roadway system due to flooding of the connecting roadway to the south. The proposed design would accommodate a practical amount of sea level rise, but not extreme conditions where the surrounding community would be submerged underwater and bridge use for vehicular mobility would be irrelevant.

Overall, the bridge would be incrementally both wider and higher than the existing structure. The elevation of the bridge deck of the Camino del Mar roadway at the proposed southern and northern abutments would be 19.75 and 20.96 feet, respectively. When compared to the existing abutment elevations, the southern abutment would be raised from 16.99 feet to 19.75 feet (an increase of 2.76 feet); the northern abutment would be increased from 19.80 feet to 20.96 feet (an increase of 1.16 feet); and the mid span would be raised from 17.14 feet to 24.84 feet (an increase of 7.7 feet). The proposed bridge foundation would consist of two abutments and four piers supported by columns and piles that would support the bridge superstructure as shown on Figure 4, *Proposed Bridge Typical Plan View and Elevation*. The new bridge would utilize the existing abutments, with new riprap added to the existing riprap. As shown on Figure 5, *Proposed Bridge Typical Section*, the Camino del Mar Bridge would include a striped median at the centerline, northbound and southbound traffic lanes and bike lanes separated by a buffer (striped), and pedestrian sidewalks at the outer edges of the bridge separated from the bike lanes by bridge railings. Concrete curbs and metal hand railings would line the eastern and western edges of the replacement bridge. Two pedestrian lookouts approximately 237 square feet in size may be located on the west side of the bridge only, facing towards the Pacific Ocean.

Construction Methods and Phasing

The project is estimated to be constructed over ~~27~~ 36 months between ~~June 2024~~ March 2026 and ~~August 2026~~ March 2029 using five construction stages: site preparation, east-side bridge replacement, west-side bridge replacement, closure of the center median, and final improvements.[1] Continuous vehicular and pedestrian access along the Camino del Mar Bridge would be maintained throughout construction, with the exception of up to ~~12~~ 14 temporary nighttime full bridge closures, discussed

[1] Likely construction methods are based on professional Engineer and Construction Manager previous experiences monitoring and inspecting commonly used construction techniques for similar projects with reasonably similar constraints, including both permanent and temporary impact areas. Actual methods and timing of construction sequences may vary based on the contractor.



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Source: Base Map Layers (SanGIS, 2016)

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Regional Location

Figure 1



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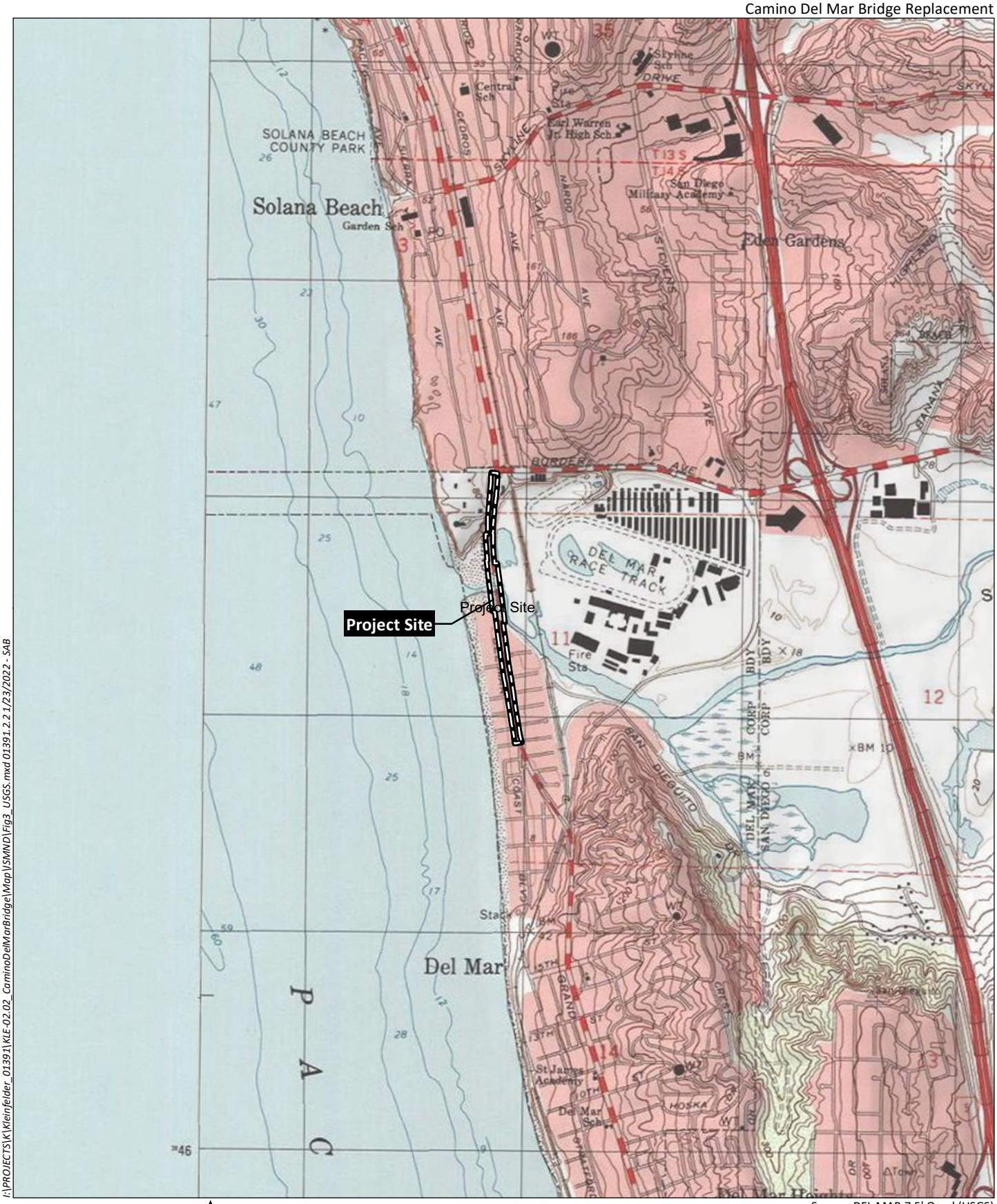
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Source: Aerial (SanGIS and Nearmap, 2019)

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Project Location

Figure 2

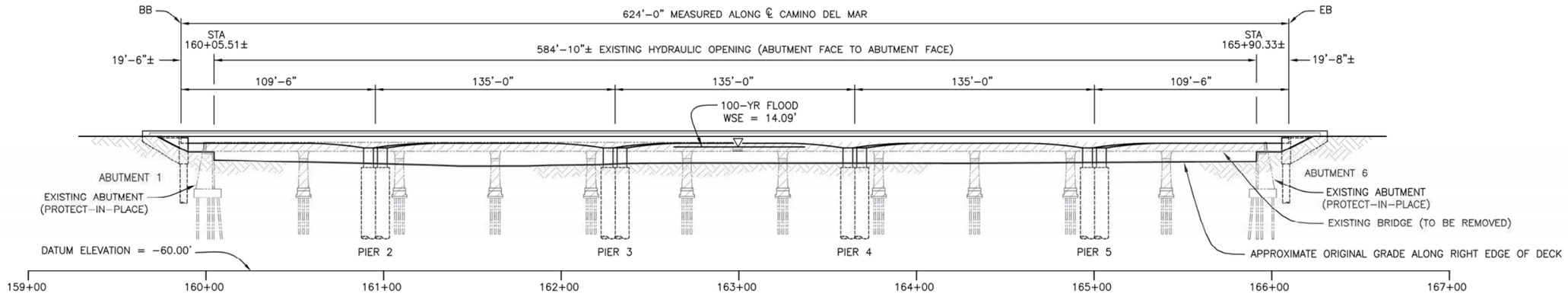


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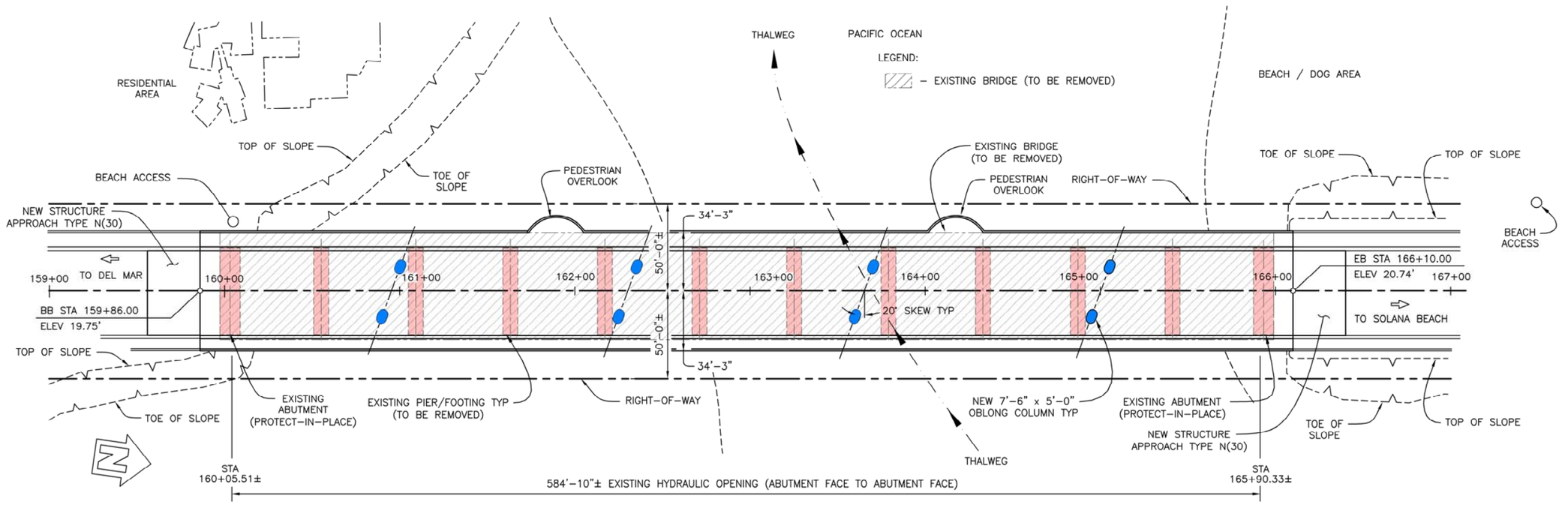
Project Location – USGS

Figure 3



ELEVATION

1" = 30'–0"



PLAN

1" = 30'–0"

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
11	2,350±

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
5	257

STAGE 5 - FINAL CONDITION

ALTERNATIVE 1.1: 5-SPAN VARIABLE DEPTH CAST-IN-PLACE PRESTRESSED CONCRETE BOX GIRDER BRIDGE WITH TWO COLUMNS PER PIER

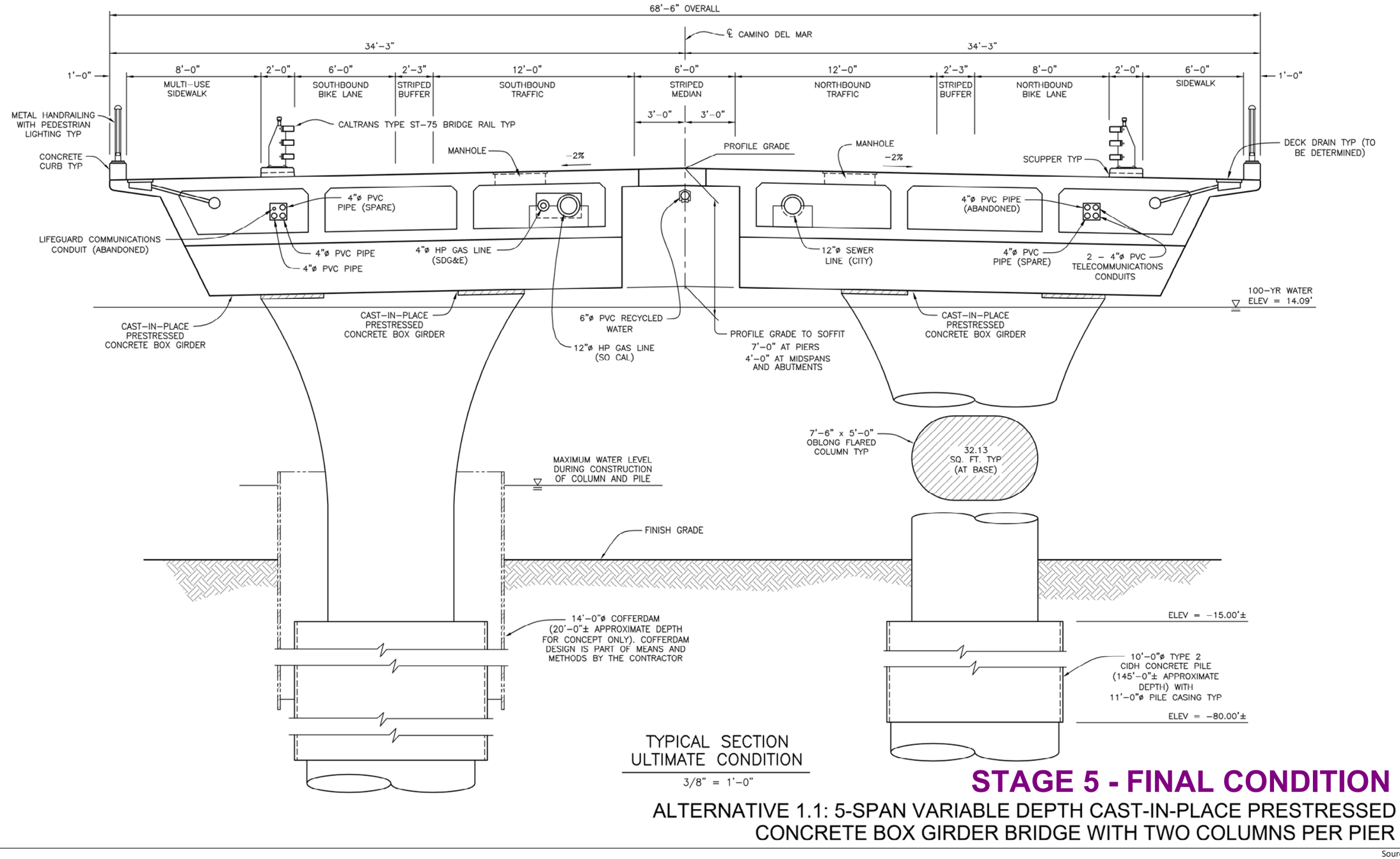
Source: Kleinfelder 2021

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Proposed Bridge Typical Plan View and Elevation

Figure 4



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Source: Kleinfelder 2021

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Proposed Bridge Typical Section

Figure 5

further below. Pedestrian coastal (beach) access at four existing coastal access points near the bridge also would be maintained throughout the construction period.

Travel lanes along Camino del Mar, including vehicle, pedestrian, and bicycle lanes, would be shifted from one side to the other as the bridge is replaced. Bridge demolition and replacement would occur at one half of the bridge at a time, beginning with the east side (lagoon side) followed by the west side (ocean side). During the demolition and replacement of each side of the bridge, the opposite side would be used to re-route both lanes of traffic. The existing travel way in each direction is approximately 22 feet wide, allowing for two temporary 11-foot-wide travel lanes during construction. Details for each of the construction stages are further described below. Work areas at the bridge that are expected to be utilized by the construction contractor are depicted on Figure 6, *Construction Work Areas*. Existing utilities within the bridge would be temporarily relocated to a utility passage within the temporary work trestle while each side of the bridge is being replaced, unless the utility provider determines they may be temporarily shut down for the duration of construction.

The temporary work trestle would consist of an approximately 50-foot-wide elevated platform that spans the entire floodway from each existing abutment, on both sides of the existing bridge. The temporary trestle may be installed and removed via crane, vibratory hammer, impact hammer, and forklifts. Common earthwork equipment such as excavators, loaders, etc. may be used at the bridge approaches where the trestle starts and ends. ~~Temporary construction easements~~ A new lease agreement or an amendment of the existing lease issued to the City for the bridge right-of-way in June 2000 (Lease No. PRC 8181.9) would be obtained from the California State Lands Commission for the temporary work trestle that would temporarily encroach into state tidelands. A temporary construction easement may also be required~~, as well as~~ to access one private property southeast of the project (Assessor's Parcel Number 299-030-1919) where a noise barrier is being considered.

Cofferdam systems (enclosures that provide a dry work environment within the river channel below the bridge) would be utilized for removal of existing piers and installation of the new bridge foundations and column. Cofferdams may be constructed of sheet piles or other shoring materials and would be installed and removed via crane and vibratory hammer. Cofferdams may be dewatered as needed using pumps to perform demolition and/or new construction activities. Dewatering is a common practice during bridge construction that is regulated by the Regional Water Quality Control Board to ensure that water removed during dewatering is properly treated prior to discharge to the receiving location. Dewatering activities would be conducted in compliance with Caltrans' Field Guide to Construction Site Dewatering and National Pollutant Discharge Elimination System (NPDES) permit requirements, including implementation of Best Management Practices (BMPs) such as filtering the water through a geotextile material filter bag prior to discharge. Other equipment such as excavators, forklifts, loaders, etc. may be used for excavation, backfill, material handling, or shoring.

Temporary falsework would be installed to form and construct the bridge foundations and bridge spans. Wood piles from the existing bridge foundation would be partially removed to below the sand level or entirely removed if they conflict with the proposed foundation of the replacement bridge. Existing pier footings may be removed via sawcutting and/or excavators with concrete breaking attachments. New piers would be constructed of CIDH piles, which may be constructed using cranes, drill rigs, oscillators and/or rotators, vibratory hammers, forklifts, and concrete boom trucks. Common earthwork equipment such as loaders, etc. may be used for handling of drilling spoils. Temporary ground-level access for construction equipment would be required at the northwest and southeast ends of the bridge for construction and removal the temporary trestle, work platform, and falsework; and for demolition

and replacement of the bridge structure. Existing public access to Del Mar Beach would be maintained throughout construction. As a condition of approval of the project, the contractor would be responsible for developing a plan to keep debris out of the lagoon. This may include suspending protective covers from the existing bridge, on the ground below, or floating on the water. The falsework would also serve to protect the lagoon from debris.

In addition to the specific equipment identified above, a variety of standard construction equipment would be used, including, but not limited to, backhoes/loaders, excavators, tractors, dozers, concrete breakers, concrete saws, pile installation equipment, and miscellaneous trucks. A list of specific equipment types provided in the Air Quality and Greenhouse Gas Emissions Assessment Letter, where it is relevant for modeling purposes (HELIX 2021; Appendix A to this IS/MND). Refer to Table 3, *Off-road Equipment*, of the Air Quality/GHG report for the assumed equipment types and quantity used.

Based on the proximity of the project to the San Dieguito River mouth, standard construction operating procedures/commitments and BMPs would be implemented for the protection of sensitive biological resources, as well as water quality, including turbidity. Measures to control sediment and erosion during construction may include, but are not limited to: (1) installing erosion and sediment control devices such as silt fences, fiber rolls, mulching or soil binders, plastic covers, and gravel bags in appropriate locations; (2) placing temporary filters at storm drain inlets (e.g., gravel bags/filter fabric); (3) designating containment areas for material storage (e.g., covering/berming of soil stockpiles); (4) providing containment areas for solid waste storage and concrete washout; (5) construction of temporary berms; (6) limiting fueling/maintenance of equipment to designated areas outside and away from waters or wetlands areas; and (7) installing material containment devices for refueling or fixing equipment that is not easily movable away from waters.

Project construction commitments and operating procedures for "in-water" work within the San Dieguito River mouth also would be employed. Such procedures may include, but are not limited to: (1) installing impermeable barriers or turbidity curtains; (2) installing exclusionary fencing to exclude grunion entry into the project work areas between September 1 and February 28; (3) using temporary cofferdams or temporary berms where practicable; (4) employing air bubble curtain technologies or cushion block devices on the pile-driving, hammering, and drilling machinery to reduce vibrations, hydroacoustic, and channel bottom disturbances; (5) limiting the use of hammer-style or pile driver machinery; (6) wrapping pile and hammer drivers with sound blankets; (7) installing vibratory dampeners on driver/hammer heads, where feasible; (8) using electrically powered equipment instead of pneumatic or internal-combustion powered equipment; and (9) scheduling construction within water and wetlands to occur during low tides. These measures would be identified on construction documents and implemented as conditions of approval of the project. Measures prescribed during the consultation review of the project by applicable agencies (e.g., CDFW, NOAA, etc.) would also be required.

As part of these construction commitments, a "worker environmental awareness training" would be conducted at the project site prior to construction for each on-site construction crew member. Additionally, a designated project biologist would conduct regular construction monitoring to monitor environmental compliance and ensure the project construction operating procedures and BMPs are implemented/maintained.

Although access along the bridge generally would be maintained throughout construction, some temporary short-term roadway closures may occur between the hours of 10:00 p.m. and 6:00 a.m. when continuous vehicle use is not compatible with specific construction activities. Short-term closures are

Camino Del Mar Bridge Replacement



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0 300 Feet

Source: Aerial (Nearmap, 2021)

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Construction Work Areas

Figure 6

anticipated for up to four nights during Stage 1 (to prepare the site and remove the roadway median); for one night each near the beginning of Stages 2, 3, and 4 (to shift traffic prior to demolition of each side of the bridge and prior to the median concrete pour); and for one night at the end of the project when the bridge is completed and the roadway is prepared for its final re-opening. Up to ~~four~~ six additional night closures may be necessary during Stages 2 and 3 for oversized and major materials deliveries. This totals up to ~~12~~ 14 temporary, short-term night closures of the bridge during the ~~27~~ 36-month construction period. In compliance with Del Mar Municipal Code (DMMC) Section 23.28.130, a Traffic Control Plan (TCP) would be prepared by a registered traffic engineer and implemented to ensure safe movement of vehicular, bicycle, and pedestrian traffic and adequate emergency access for police, fire, and medical services in the local area (City 2021a). The TCP would include public information for motorists, bicyclists, and pedestrians; lane closures and road detours associated with overnight construction activities; incident management; and construction information. Temporary signs and traffic control advanced warning devices would be placed along the roadway, within the street right-of-way. The contractor would obtain traffic control permits from the City.

Due to limited on-site construction staging areas, the contractor is anticipated to need additional off-site staging areas for materials, equipment, and office purposes (refer to Figure 7, *Off-site Potential Construction-period Staging Areas)*. Areas that have been identified for potential staging uses include the State Fairgrounds and the City's Public Works Yard; these potential staging areas are included within this evaluation. The Public Works Yard is a City-owned area that is unpaved and relatively flat. This area is typically used for overnight storage of construction equipment and is located at the intersection of San Dieguito Drive and Jimmy Durante Boulevard (2240 Jimmy Durante Boulevard), just southeast of the bridge. Temporary worker parking is anticipated to occur at the City's Public Works Yard.

Construction activities by stage are summarized below.

Stage 1 – Site Preparation

Site preparation would occur over a ~~two~~three-month period and require installation of erosion control measures, preparation of the beach level for temporary work trestle installation, relocation of pedestrian crosswalks across Camino del Mar, and removal of the raised concrete median and vegetation/trees within and along the Camino del Mar roadway near the bridge. Stage 1 would also involve preparation of the beach areas on both sides of the bridge, which would involve establishing construction contractor fencing, installing a covered pedestrian boardwalk (southwest corner) to provide residents and visitors with access to Del Mar Beach, and displaying signage that directs coastal visitors to coastal amenities in the area, including the beaches and the River Path Del Mar (River Path).

The two crosswalks closest to each abutment would be temporarily relocated during construction. The crosswalk at the southern abutment that connects to the River Path to the east and Del Mar Beach to the west would be removed and a temporary crosswalk would be established further south at Sandy Lane, about 300 feet from the southern bridge abutment. The temporary crosswalk would connect to existing sidewalks along Camino del Mar and would maintain access to the River Path and Del Mar Beach throughout the entire ~~27~~36-month construction period. The crosswalk at the northern abutment would also be removed and the existing crosswalk to the north would remain to provide pedestrian access to Del Mar Beach during construction. One parking space would be temporarily lost on the southeast side of the bridge during Stage 1. No permanent losses to parking would occur during Stage 1.

Stage 2 – East-side Bridge Replacement

During a ~~10~~ 14-month period following demolition of the east side of the bridge and preparation and construction of new supports, the eastern half of the bridge superstructure and deck would be formed and constructed prior to trestle removal. The existing pedestrian walkway located on the west side of the existing bridge would be maintained during Stage 2. Both lanes of traffic and pedestrian access would be re-routed from the west side to the newly constructed east side of the bridge in preparation for Stage 3 (west side). The temporary trestle would also be disassembled and re-assembled on the west side of the bridge to support construction of Stage 3.

Temporary parking losses along Camino del Mar during Stage 2 would total 55 spaces, including spaces to the northwest (13), northeast (19), southwest (10), and southeast (13). Four parking spaces would be permanently lost for the project, including one space located north of the bridge and three spaces located south of the bridge.

Stage 3 – West-side Bridge Replacement

During a ~~10~~ 14-month period following demolition of the existing structure, the western half of the bridge superstructure and deck would be formed and constructed prior to trestle removal. Similar parking spaces described above for Stage 2 would be temporarily lost during Stage 3. Temporary parking losses along Camino del Mar during Stage 3 would total 54 spaces, including spaces to the northwest (12), northeast (19), southwest (10), and southeast (13). Four parking spaces would be permanently lost for the project.

Stage 4 – Bridge Median Improvements

Once the two halves of the bridge are constructed in Stages 2 and 3, a four-foot-wide closure pour would occur in the center of the bridge, connecting the two sides of the bridge and creating the new median and area for utility lines. Stage 4 would occur over a ~~two~~three-month period. Four parking spaces permanently lost for the project during Stage 2 (one space located north of the bridge and three spaces located south of the bridge) would remain unavailable during Stage 4. No temporary parking space losses are associated with Stage 4.

Stage 5 – Final Improvements

Stage 5 would consist of final contour grading and street improvements in Camino del Mar, including new pavement, curb and gutter, pedestrian ramps, traffic signage, striping and marking (vehicles and bicycles), utility lines (water, sewer, gas), storm drains (curb inlets, catch basins, and outfall pipes), and installation of permanent water quality devices to treat and discharge road runoff during storm events. Two tree wells are proposed, one at the northwestern side and another at the southeastern side of the bridge approach in order to provide stormwater management/treatment and achieve Green Street compliance. A “Green Street” is a street right-of-way that uses low impact development facilities to manage stormwater runoff close to its source (County of San Diego 2019). The proposed tree wells would be constructed according to the latest County of San Diego Green Streets Design Criteria and Standard Drawings and Caltrans standard plans, and in accordance with City Council Policy 114. Each tree well would be a minimum 24 square feet in size and would include biofiltration soil and one 20-foot canopy tree species selected from the County of San Diego list of approved trees, which may include species such as Torrey pine (*Pinus torreyana*), southern magnolia (*Magnolia grandiflora*), and hybrid strawberry tree (*Arbutus ‘Marina’*), among others.



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0 500 Feet

Source: Aerial (Nearmap, 2021)

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Off-site Potential Construction-period Staging Areas

Figure 7

Finally, construction equipment, materials and debris, and temporary traffic control and erosion control devices would be removed at the end of the construction period, with this final phase lasting approximately ~~three~~ two months. No temporary parking space losses are associated with Stage 5. As noted, four parking spaces permanently lost for the project during Stage 2 (one space located north of the bridge and three spaces located south of the bridge) would remain unavailable at project completion, as depicted on Figure 8, *Permanent Loss of Four Parking Spaces*.

9. Surrounding land uses and setting:

The project site includes the existing bridge along Camino del Mar over the lagoon and areas immediately surrounding the bridge (see Figures 1 through 3). Regional access to the project site is provided from Interstate 5 (I-5), which trends parallel to the bridge approximately one mile to the east. The bridge serves as an important north-south connection for coastal residents and visitors in the vicinity and the greater San Diego region and is frequently used by motorists, bicyclists, and pedestrians. The bridge is situated between the State Fairgrounds and the Pacific Ocean near coastal destinations and provides access to local beaches, open space areas, hiking trails, the Del Mar Village (the City's central business district), and Torrey Pines State Beach. The Camino del Mar roadway becomes Highway 101 north of Via de la Valle within the City of Solana Beach, approximately 0.25 mile north of the bridge.

Camino del Mar is the major north-south route through Del Mar. North of the bridge, the two-lane divided road features parallel and diagonal street parking. Parallel parking is also located south of the bridge. Class II bicycle lanes are located along the length of the project area in both directions, with buffered bike lanes located along portions of the street off the bridge. Sidewalks are provided along both sides of Camino del Mar between Via de la Valle and Coast Boulevard except on the east side of the Camino del Mar Bridge. The sidewalks generally immediately abut the roadside parking except for over the bridge, where the pathway is located slightly west of the bridge near, and with access to, the beach. Marked crosswalks are provided on both the north and south ends of the bridge for connectivity. Based on traffic counts conducted as part of the Traffic Impact Analysis prepared for the project, average daily traffic on Camino del Mar near the project site (from Via de la Valle to Coast Boulevard) on a typical weekday is approximately 12,540 vehicles on a roadway with a capacity of 15,000 trips (STC Traffic Inc. [STC] 2018).

The bridge is located approximately 500 feet inland of the beach and extends over the lagoon, near where the mouth of the San Dieguito River outlets to the Pacific Ocean. Lower elevation areas within the project vicinity, including beach and marsh areas, are subject to tidal influence based on elevation and proximity to the Pacific Ocean. During 50- and 100-year flood events there is no space between the top of the water surface and the bottom of the bridge. The southern bridge abutment includes riprap that protrudes into the lagoon floodway and has an adjacent coastal access point at the western terminus of the River Path that continues east along the lagoon. No public access is allowed below the bridge.

Existing natural and developed conditions at the bridge and surrounding areas are shown on Figure 9, *General Project Setting*. Figure 10, *Focused Project Setting*, centers the setting on the bridge, allowing for a more detailed look at the immediately surrounding uses. As shown, surrounding areas include residential uses south of the bridge; the lagoon, the Los Angeles–San Diego–San Luis Obispo (LOSSAN) corridor railroad trestle bridge crossing the San Dieguito River that is maintained by the North County Transit District (NCTD; NCTD rail bridge), and the State Fairgrounds to the east; residential development to the south; and public beaches and the Pacific Ocean to the west. North of the bridge is a tall coastal

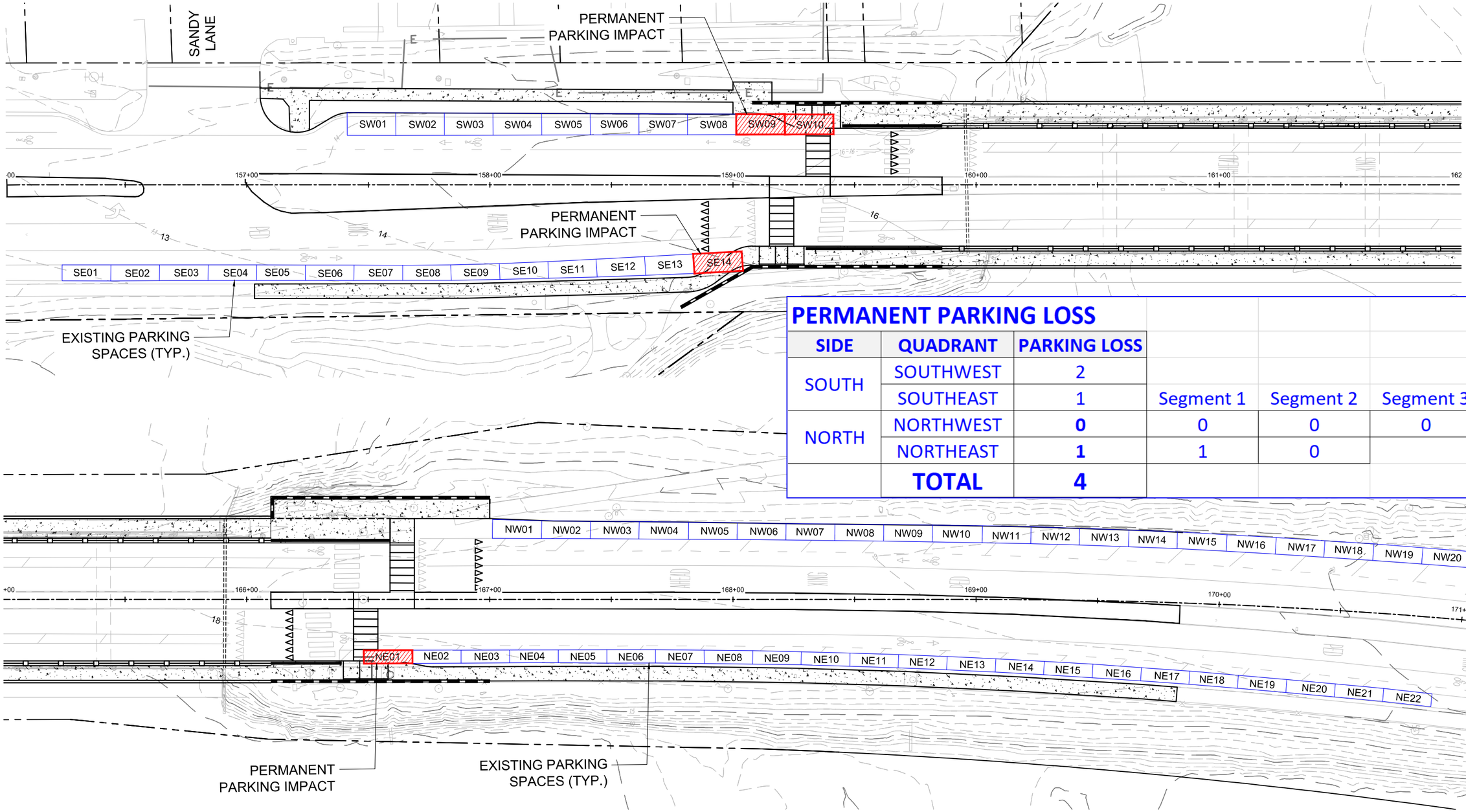
bluff along the western edge of Camino del Mar that contains passive recreational opportunities within the James G. Scripps Bluff Preserve (Scripps Bluff Preserve). The lagoon extends eastward from the bridge to beyond I-5. The NCTD rail bridge spans the lagoon parallel to and 500 feet east of the Camino del Mar Bridge. An alternative north-south roadway connection in the area occurs along Jimmy Durante Boulevard, which crosses the lagoon at a bridge (Jimmy Durante bridge) about 0.40 mile southeast of the Camino del Mar Bridge.

Parking in the area is limited as there are no public parking lots or parking structures in the immediate vicinity. Visitors to the beaches and recreational amenities near the bridge typically park at striped parking spaces north and south of the bridge along both sides of Camino del Mar and along side streets. There are approximately 140 existing parking spaces available north and south of the bridge along Camino del Mar; parking is not allowed on the bridge. Where parking is allowed, some spaces are metered, with ability to "pay as you go," or purchase an all-day pass from the "pay and display" boxes. Beyond 29th Street and to the south, parking is unmetered (free) on both sides of Camino del Mar. Bike racks are located at Del Mar Beach.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):

    - NEPA compliance (issued by Caltrans);
    - Consolidated Coastal Development Permit (issued by the California Coastal Commission [CCC]);
    - Section 404 Nationwide Permit 14 (issued by the United States Army Corps of Engineers [USACE]);
    - Section 7 Consultation (concurrent with the U.S. Fish and Wildlife Service [USFWS] and National Oceanic Atmospheric Administration [NOAA] National Marine Fisheries Service [NMFS]);
    - Section 1602 Streambed Alteration Agreement (issued by the California Department of Fish and Wildlife [CDFW]);
    - Section 401 Water Quality Certification (issued by the San Diego Regional Water Quality Control Board [RWQCB]);
    - National Pollutant Discharge Elimination System (NPDES) Permit (issued by RWQCB);
    - Habitat Mitigation and Monitoring Plan (acceptable to the USACE, USFWS, RWQCB, CDFW, and CCC); and
    - Lease Agreement (new or amended) for Public Agency Use (issued by the California State Lands Commission to allow temporary access onto state lands during construction).

As noted above, the USACE, CDFW, RWQCB, and CCC are anticipated to have some permitting authority over the project and would issue the above-listed permits for the project to be constructed. These agencies have a responsibility to regulate discharges of dredged or fill material, including impacts to riparian/wetland vegetation. The USACE, CDFW, RWQCB, and CCC would have permitting authority over



PERMANENT PARKING LOSS

SIDE	QUADRANT	PARKING LOSS	Segment 1	Segment 2	Segment 3
SOUTH	SOUTHWEST	2			
	SOUTHEAST	1	Segment 1	Segment 2	Segment 3
NORTH	NORTHWEST	**0**	0	0	0
	NORTHEAST	**1**	1	0	
	TOTAL	**4**			

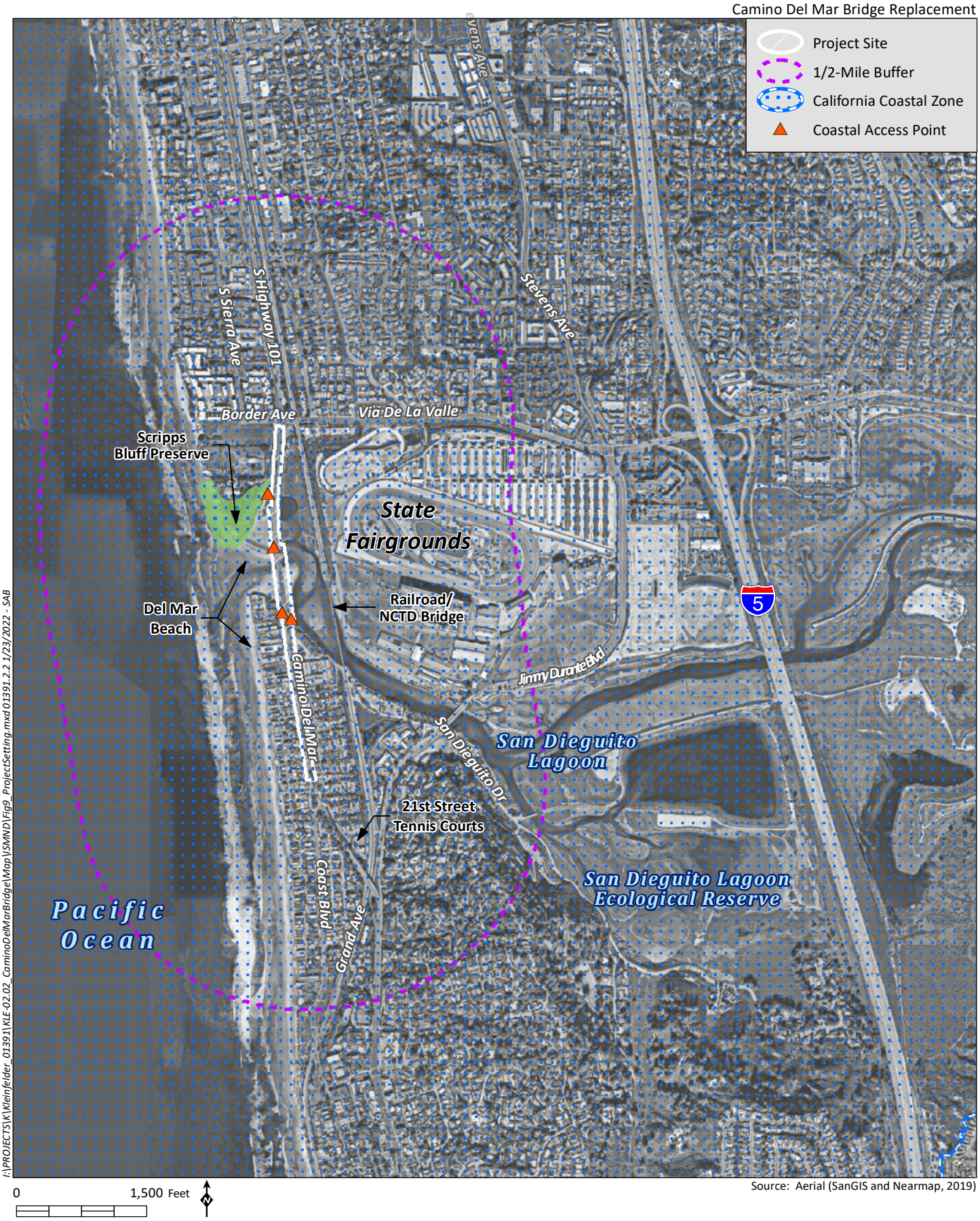
Source: Kleinfelder 2021

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Permanent Loss of Four Parking Spaces

Figure 8



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General Project Setting

Figure 9



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0 1,000 Feet

Source: Aerial (SanGIS and Nearmap, 2019)

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Focused Project Setting

Figure 10

the project because the installation of the foundations and associated decking would occur in areas associated with the San Dieguito Lagoon, which are considered potential federal wetlands, waters of the United States, waters of the State, state of California streambed or riparian habitat, and coastal wetlands. Final requirements for regulatory permits would be determined in consultation with the resource agencies.

11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

Notices in accordance with the requirements of Assembly Bill (AB) 52 were sent via certified mail on September 28, 2021 to 14 nearby tribes, giving 30 days for the tribes to reply. Two responses were received from the San Pasqual Band of Mission Indians, dated November 3, 2021, and December 15, 2021. The response letters indicated that the project is located within the boundaries of the territory that the tribe considers its Traditional Use Area, and they would like to engage in consultation with the City to be involved in the development of the measures taken to mitigate potential adverse impacts. Additional coordination with California Native American tribes has occurred as part of the project as further described in Sections V, *Cultural Resources*, and XVIII, *Tribal Cultural Resources*.

1.2 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" or "Less than Significant with Mitigation Incorporated" as indicated by the checklist on the following pages.

■ Aesthetics	☐ Agriculture and Forestry Resources	☐ Air Quality
■ Biological Resources	■ Cultural Resources	☐ Energy
■ Geology and Soils	☐ Greenhouse Gas Emissions	■ Hazards and Hazardous Materials
☐ Hydrology and Water Quality	☐ Land Use and Planning	☐ Mineral Resources
■ Noise	☐ Population and Housing	☐ Public Services
☐ Recreation	☐ Transportation	■ Tribal Cultural Resources
☐ Utilities and Service Systems	☐ Wildfire	■ Mandatory Findings of Significance

1.3 Determination

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect I) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature	Date
Printed name	For

2.0 Environmental Initial Study Checklist

The lead agency has defined the column headings in the environmental checklist as follows:

A. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

B. "Less Than Significant with Mitigation Incorporated" applies where the inclusion of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." All mitigation measures are described, including a brief explanation of how the measures reduce the effect to a less than significant level. Mitigation measures from earlier analyses may be cross-referenced.

C. "Less Than Significant Impact" applies where the project does not create an impact that exceeds a stated significance threshold.

D. "No Impact" applies where a project does not create an impact in that category. "No Impact" answers do not require an explanation if they are adequately supported by the information sources cited by the lead agency which show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project would not expose sensitive receptors to pollutants, based on a project specific screening analysis).

The explanation of each issue identifies the significance criteria or threshold used to evaluate each question; and the mitigation measure identified, if any, to reduce the impact to less than significance. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration [CEQA Guidelines Section 15063(c)(3)(D)]. Where appropriate, the discussion identifies the following:

a) Earlier Analyses Used. Identifies where earlier analyses are available for review.

b) Impacts Adequately Addressed. Identifies which effects from the checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and states whether such effects were addressed by mitigation measures based on the earlier analysis.

c) Mitigation Measures. For effects that are "Less Than Significant with Mitigation Incorporated," describes the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

I. Aesthetics

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:					
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	■	☐
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	■	☐	☐
c)	In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	■	☐
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	■	☐

Discussion

The existing visual setting of the project site and surrounding areas is depicted in Figures 11a-b, *Existing Visual Setting*, which contain views from the public trail and bluffs to the northwest (Photograph A), residential development within the bluffs to the southeast (Photograph B), the pedestrian pathway near the southwestern end of the bridge (Photograph C), and the Brigantine restaurant northeast of the project site. Visual context of the bridge location includes a mix of open space and suburban uses, where development is comprised primarily of residential, recreational, and commercial uses. The bridge crosses over the San Dieguito Lagoon and associated river outlet to the Pacific Ocean. Immediately abutting the project corridor to the west are Del Mar Beach and the mouth of the San Dieguito River west of the project site. The James G. Scripps Bluff Preserve is located northwest of the bridge (refer to Figures 9 and 10) and contains paths and seating areas with panoramic views to the west, south, and east. Access is provided via Del Mar Beach and a partially paved access path is constructed into the east-facing slope of the bluff landform. The south- and east-facing slopes of the bluff are covered with low, coastal sage scrub vegetation that displays tones of brown, gray, and green. The location provides highly valued views to each of these amenities. To the east is the LOSSAN corridor railroad trestle bridge, the State Fairgrounds, and the I-5 freeway corridor.

Topography within the project site (as well as in the immediate areas to the east and south) is relatively flat, with elevations ranging from approximately 9 feet above mean sea level (AMSL) at the northern terminus of the project corridor, to approximately 21 feet AMSL at the southern terminus of the project corridor (refer to Figure 3). The elevation of the bridge deck of the Camino del Mar roadway at the proposed southern and northern abutments would be increased by 2.76 feet and 1.16 feet, respectively, and the mid span would be raised by 7.7 feet.

As discussed in detail in the VIA, a number of key views (KVs) from public viewpoints were identified based on the number and frequency of views, the potential sensitivity of viewers, and the types of project-related features that would be visible. KV locations are shown on Figure 12, *Key View Locations*, and listed below:

- KV 1 – From Del Mar Beach looking east-southeasterly toward the bridge.
- KV 2 – From River Path Del Mar looking northwesterly toward the bridge.
- KV 3 – From the State Fairgrounds western boundary looking westerly toward the bridge.
- KV 4 – From Sandy Lane Residences south of the San Dieguito River looking northeasterly toward the bridge.
- KV 5 – From the south side of the Camino del Mar Bridge looking northerly along the bridge.

The following analysis is supported by visual simulations that have been created from the identified KVs to provide a visual comparison of the existing conditions with the proposed final condition, as shown in Figures 13a-e, *Pre- and Post-project Views*.

a) Have a substantial adverse effect on a scenic vista?

Less Than Significant Impact. Scenic vistas are defined as views or vistas generally expansive or panoramic in nature, usually from an elevated point or open area, that possess visual and aesthetic qualities of high value to the community. For purposes of this analysis, a substantial adverse effect on a scenic vista or view would occur where the majority of an existing view would be blocked or substantially interrupted. Section 30251, Scenic and Visual Qualities, of the California Coastal Act states that "the scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance" (Public Resources Code Division 20, Chapter 3, Article 6, Section 30251). Further, permitted development "shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural landforms, to be visually compatible with the character of surrounding areas and where feasible, to restore and enhance visual quality in visually degraded areas."

The project is sited within scenic view areas to both the east (lagoon) and west (ocean), which also contain commercial and residential development in addition to open space. The Community Plan (General Plan) does not designate specific scenic resources but identifies scenic protection areas throughout the City and encourages harmonious development which is in scale with the character of existing development; is sensitive to bluff, lagoon, and ocean views; and blends with the open character of the land. Specifically, the Transportation Element identifies the entire lagoonal plain and the bluffs immediately parallel and southwest of the project site as part of a scenic protection area. This area is generally west of I-5, south and east of Jimmy Durante Boulevard, and north of Racetrack View Drive. Additionally, the introductory chapters of the City's Community Plan (General Plan) identify scenic views from the bluffs south and west of the project site and refer to a diversity of views from the community's hills and winding streets as positive community assets (City 2019a). The bluff areas south of the project include residential areas along Gatun Street, Luzon Avenue, Balboa Avenue. From these bluff areas along public roadways, most of the prominent views are western facing toward the Pacific Ocean. The existing bridge is visible in these views; however, the low structure is visually minimized by the higher and darker bluff behind it in views from the south as depicted in Figure 11a (Photograph B).



View from the pathway along the southern edge of the Scripps Bluff Preserve northwest of the project site looking southeast toward the Camino del Mar Bridge, State Fairgrounds, and residentially-developed hillsides southeast of the bridge.



Representative view from residences located on Balboa Avenue, Gatun Street, and Luzon Avenue southeast of the project site looking northwest toward the bridge, ocean, and bluffs.

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View from the pedestrian pathway at the southwest end of the bridge looking northeast toward the bluffs and residentially and commercially-developed areas of Del Mar and Solana Beach.



View from south of the Brigantine Restaurant southern patio looking southwest toward the bridge and residentially-developed hillsides of Del Mar.

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Key View Locations

Figure 12





KEY VIEW 1 – From Del Mar Beach looking east-southeasterly toward the bridge.

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KEY VIEW 2 – From River Path Del Mar looking northwesterly toward the bridge.

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Pre- and Post-project Views

Figure 13b





KEY VIEW 3 – From the State Fairgrounds western boundary looking westerly toward the bridge.

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KEY VIEW 4 – From Sandy Lane Residences south of the San Dieguito River looking northeasterly toward the bridge.

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KEY VIEW 5 – From the south side of the Camino del Mar Bridge looking northerly along the bridge.

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The project would replace a bridge that has been in place since 1932. The new bridge has been carefully designed to remain within the same right-of-way and incrementally changed in terms of length (28 feet longer overall), height (less than 8 feet higher) and width (less than 7.5 feet wider). As a result, the bridge would not alter the immediately abutting bluff or lagoon/beach landforms, being located along the same alignment and right-of-way as the existing bridge. The structure would be generally visually similar to the existing bridge in extent and expanse, as well as materials, with improved bridge aesthetics as described below. The project therefore is assessed as sensitive to the adjacent bluff, ocean, and lagoon resources in this scenic coastal area, and compatible with the existing uses and open space in this developed setting that has contained a similar bridge in this location for approximately 90 years. Also similar to the existing bridge, views to the Pacific Ocean, North Beach, and San Dieguito River and lagoon would be provided to all users of the bridge, including vehicular, pedestrian, and bicyclists. Potential for pedestrian views would be improved—a protected pathway would be provided on the east side of the bridge which does not currently exist, allowing pedestrians to safely pause and admire the view. Two new viewing platforms may be sited on the west side of the bridge so that pedestrians have a protected location from which to stop and enjoy beach area views towards the Pacific Ocean. All proposed new and replacement safety barriers and bridge railings would be low profile and visually permeable similar to existing conditions. On the east side of the bridge, some immediately abutting shrubbery at road grade would be removed and replaced with a new tree. Scenic views created as a result of the landscape changes should be considered temporary until the project landscape installation is completed in accordance with the adopted landscape plans.

Where the project can be considered notably different from the existing structure is in the extent of views afforded to viewers looking under the bridge. The number of supports would be reduced to four, leaving larger upward arching spans between them that allow for more open views to prized visual features of the lagoon and coastal areas on either side of the bridge that are currently obscured by the 10 supports and low elevation of the existing bridge. This is depicted in the visual simulations in Figures 13a, 13b, and 13d, which show that the project would result in extending views to additional water and sand features valued in the area from locations such as the “North Beach” area of Del Mar Beach north of the river outlet (Figure 13a, KV 1), the River Path and adjacent residences to the southeast of the site (Figure 13b, KV 2), and the southern portion of Del Mar Beach and adjacent residences to the southwest of the site (Figure 13d, KV 4). Because those view elements are largely sand and ocean, and/or riparian and lagoonal in nature, the project would be consistent with the goal to restore and enhance visual quality in the area and to enhance public scenic views of the ocean. Therefore, the project would not have a substantial adverse effect on scenic vistas, including those identified in the City’s Community Plan (General Plan).

As described in further detail in Section XIII, *Noise*, a noise barrier is being considered at the exterior use area of the closest residence to the southeast of the bridge as a measure to minimize potential noise impacts. The proposed noise barrier would replace an existing fence in the same location and may be up to 14 inches taller than the existing fence. The proposed change from a fence to a sound reduction barrier would be subject to future design review, would not change the developed nature of the site or the built backdrop of two-story buildings, and would not block views of coastal resources. Therefore, impacts would be less than significant.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Less Than Significant with Mitigation Incorporated. There are no designated or eligible scenic highways in the area listed in the California Scenic Highway Program in the proposed project area. No rock outcroppings or historic buildings are within the right-of-way or private property where a noise barrier is being considered. The project would involve removal of low-lying vegetation and trees within the project footprint as further described below.

Low-lying vegetation would be removed from the road median. Ornamental landscaping within five feet of the existing fence where noise barrier improvements are being considered for the project would be trimmed or removed as necessary for barrier construction. The vegetation removal would not substantially damage or conflict with public scenic views or coastal resources in the vicinity. Vegetation removal would be restricted to a narrow corridor within the roadway median and potential noise barrier location in the immediate construction area—public scenic views and coastal resources (i.e., beach vegetation, sand, and water resources) would not be impacted.

Approximately seven trees would be removed between the south side of the bridge and Sandy Lane. Six are in the road median and one is on the west side of the street immediately adjacent to the southerly bridge end. Chapter 23.50 of the DMMC addresses tree removal in the City. Section 23.50 020 E.3 expressly states that in addition to the specific species of Torrey Pine and Monterey Cypress, protected trees include a "tree of any species and located on property within the Central Commercial, Open Space Overlay Zones of the City, within a public right-of-way, or on public or City-owned property" (City 2021a). This means that all seven trees are considered protected trees. The seven trees include two Torrey pines, among other species such as lemon bottlebrush (*Callistemon citrinus*). Section 23.50.080 C.10 allows removal of a protected tree if the tree obstructs proposed improvements that cannot be reasonably designed to avoid the need for tree removal. In this instance, tree removal is required in order to accommodate the necessary improvements required for bridge removal and replacement with a structure that meets applicable public health and safety standards and protection from hazards (i.e., earthquakes, flooding, and sea level rise), while remaining within the existing bridge right-of-way and not resulting in new off-site impacts. This is a Capital Improvement Program project, which means the City Council is the decision making authority at the local level for the proposed project design and tree removal.

In addition, a primary focus in this area is the beach, and the removal of these trees from the Camino del Mar public right-of-way would not adversely affect views to or from the beach sands where the bridge crosses them. Regardless, the visual loss of these trees is considered adverse due to loss of canopy, visual interest related to streetscape, and the maturity of the trees at the northern and southern extents (intervening trees are less substantial). This is supported by the City's interest in tree preservation and strict standards for approved removal. As a result, a potential significant impact has been assessed and a mitigation measure has been incorporated.

The project would include placement of two new trees in the Camino del Mar public right-of-way as part of the proposed stormwater infrastructure improvements. The new street canopy trees would be located within "Green Street" tree wells that include biofiltration soil, which would provide both aesthetic and stormwater management/treatment benefits. Mitigation for additional trees not replaced as part of project landscaping/stormwater infrastructure improvements would be covered by the City's Public Tree/Landscape Management program that is administered by the City of Del Mar Public Works

Department. The Program currently has a net excess of 78 public trees that were added via various Capital Improvement Program projects within the last five years including the Civic Center Redevelopment, Court Street Park, and Downtown Streetscape Plan. These credits can be applied towards future mitigation associated with City projects. Implementation of Mitigation measure AES-1 would reduce potential impacts to less than significant.

Mitigation Measure

AES-1 Mitigation for loss of trees within the Camino del Mar public road right-of-way shall be covered by the City's Public Tree/Landscape Management program as administered by the City of Del Mar Public Works Department. Existing credits that have been added to the Program via Capital Improvement Program projects shall be applied to the project to ensure compliance with Chapter 23.50 of the DMMC.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Less Than Significant Impact. CEQA defines the term urbanized area to mean, among other things, an incorporated city that has a population of less than 100,000 persons if the population of that city and not more than two contiguous incorporated cities combined equals at least 100,000 persons (Public Resources Code Section 21071). While Del Mar has an estimated population of approximately 4,161, the population of the adjacent cities of San Diego and Solana Beach total approximately 1,301,617 and 12,867 respectively (San Diego Association of Governments; SANDAG 2022). Although the project is not sited in a strictly urbanized area, based on the CEQA definition, potential impacts are evaluated relative to consistency with applicable zoning and other regulations governing scenic quality. The project alignment does not have a land use or zoning designation as it consists of road right-of-way. Applicable regulations governing scenic quality include the California Coastal Act and the City's Community Plan (General Plan), which are discussed above for I.a. As discussed, the project would not have a substantial adverse effect on scenic vistas, including those identified in the City's Community Plan (General Plan), nor would it substantially degrade existing visual character or quality of public views of the site and surroundings (City 2019a).

If approved, the potential noise barrier would replace an existing fence in the same location, would not change the developed nature of the site or the built backdrop of two-story buildings, and would not block coastal views. Potential barrier implementation would not degrade visual character or quality of public views in the area. Relative to loss of trees within the existing median and immediately adjacent to the southern extent of the bridge, the focused nature of their removal, the installation of two new trees, and mitigation through the City's Public Tree/Landscape Management program would result in impacts being reduced to less than significant levels. Removal of a small amount of shrubbery east of the bridge atop the existing riprap could be noticeable to west-bound users of the River Path Del Mar, but would be limited in extent and would not affect views to coastal features. Because the project would replace an existing bridge in a developed setting, and because the improved bridge would be similar to the existing structure's color and scale, it is expected to be substantially similar to the existing condition. Changes to visual resources are expected to be relatively minimal in terms of both visual character and quality, and impacts would be less than significant.

d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Less Than Significant Impact. The existing bridge does not contain street or safety lighting. During construction, up to ~~12~~ 14 temporary night closures of the bridge during the ~~27~~36-month construction period are expected during which lighting would be needed. Temporary lighting would be required to be oriented downward (toward the bridge deck) and the lighting source would be required to be shielded in order to minimize light spill. Permanent lighting has not been determined for the proposed bridge; however, if incorporated into the bridge structure/railing, lighting would be consistent with applicable lighting design standards that require lighting be oriented downward (toward the bridge deck/pedestrian path) and that the light source be shielded to minimize light spill. Lighting may be installed within the bridge curbs or railings. If installed within the railings, lighting would not be located on a stand-alone stanchion or pole exceeding the railing height and would not be notable from afar. All fixtures would be designed with lighting not to exceed 2,700 on the Kelvin light scale.

In terms of potential glare, the bridge would be restricted to the same maximum traffic volume as the current two-lane bridge (one lane in each direction). Additional traffic loading in the project area is therefore not expected to result from the proposed improvements. As a result, substantial additional vehicle lights would not be expected, and no new substantial source of glare is anticipated. Relative to the potential noise barrier, materials would either consist of non-reflective clapboard-style cladding or a transparent material for upper portions of the barrier. If transparent materials are used, it is possible that under specific circumstances they could provide additional light or glare should headlights hit them directly. This is not expected because the barrier would be peripheral rather than ahead of northbound drivers located to the west, and both peripheral and largely shielded by landscaping for southbound drivers. Based on these considerations, impacts resulting from a new source of substantial light or glare would be less than significant.

II. Agriculture and Forestry Resources

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	■
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	■
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	■

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	■
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non- forest use?	☐	☐	☐	■

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact. The project site does not contain prime farmland, unique farmland, or farmland of statewide importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency (California Department of Conservation [DOC] 2018). As such, there is no potential for the project to result in the conversion of farmland resources to a non-agricultural use. No impact would occur.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The project site is not zoned for agricultural use, nor is there a Williamson Act contract on the site. Therefore, the project would not conflict with existing zoning for agricultural use or conflict with a Williamson Act contract. No impact would occur.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

No Impact. No land zoned as forest land or timberland exists within the proposed project boundaries. The project would not conflict with existing zoning for forest land or timberland. No impact would occur.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. As discussed in II.c, no land zoned as forest land or timberland exists within the proposed project boundaries. As such, the project would not result in the loss of forest land or conversion of forest land to other uses. No impact would occur.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

No Impact. No agricultural land uses, forest land, or timberland exists in the vicinity of the proposed project. The project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use or forest land to non-forest use. No impact would occur.

III. Air Quality

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	■	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	■	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	■	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	■	☐

The following discussion is based on the Air Quality and Greenhouse Gas Emissions Assessment Letter prepared by HELIX Environmental Planning (HELIX; 2021) and included as Appendix A to this IS/MND. Following circulation of the Draft IS/MND for public review, it was determined that a 36-month construction duration would be more appropriate for the project than the 27-month construction duration identified in the Draft IS/MND. The Air Quality and Greenhouse Gas Assessment Letter modeling was based on an estimated 27-month construction duration. The quantity, duration, and the intensity of construction activity influence the amount of construction emissions and their related pollutant concentrations that occur at any one time. As such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction is occurring in a relatively intensive manner. Because of this conservative assumption, actual emissions could be less than those forecasted. If construction is delayed or occurs over a longer time period (i.e., 27 vs. 36 months), emissions could be reduced because of (1) a more modern and cleaner-burning construction equipment fleet mix than incorporated in the CalEEMod, and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval). Therefore, the Air Quality and Greenhouse Gas Assessment Letter has not been revised to reflect the 36-month construction duration, since estimated emissions are well below the CEQA significance thresholds and an extended construction schedule would result in reduced emissions compared to what was previously analyzed.

Discussion

The project site is located within the San Diego Air Basin (SDAB). The San Diego Air Pollution Control District (SDAPCD) and SANDAG are responsible for developing and implementing the regional clean air plan to attain and maintain ambient air quality standards and compliance with other requirements of federal and state laws in the SDAB. As required by the California Clean Air Act, the SDAPCD has published various air quality planning documents to address requirements to bring the SDAB into

compliance with the federal and state ambient air quality standards. The SDAPCD has prepared the San Diego County Regional Air Quality Attainment Plan (Attainment Plan), demonstrating how the region will further reduce air pollutant emissions to attain the current National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS).

Concentrations of ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter (PM_{10} and $PM_{2.5}$) are commonly used as indicators of ambient air quality conditions. These pollutants are known as criteria pollutants and are regulated by the U.S. Environmental Protection Agency (USEPA) and California Air Resources Board (CARB) through the NAAQS and CAAQS, respectively. The NAAQS and CAAQS limit criteria pollutant concentrations to protect human health and prevent environmental and property damage. Other pollutants of concern in the project area are nitrogen oxides (NO_X) and reactive organic gases (ROG), which are precursors to ozone, and diesel particulate matter (DPM), which can cause cancer and other human health ailments. These toxic air contaminants (TACs) are a diverse group of air pollutants that may cause or contribute to an increase in deaths or in serious illness, or that may pose a present or potential hazard to human health. It is estimated that about 70 percent of total known cancer risk related to air toxics in California is attributable to DPM (CARB 2021).

CARB is required to designate areas of the state as attainment, nonattainment, or unclassified for the ambient air quality standards. An “attainment” designation for an area signifies that pollutant concentrations do not violate the standard for that pollutant in that area. A “nonattainment” designation indicates that a pollutant concentration violated the standard at least once. The SDAB is currently in nonattainment for federal and/or state ozone, PM_{10}, and $PM_{2.5}$ standards. Concentrations of all other pollutants meet state and federal standards.

Criteria pollutant emissions for project construction were estimated using the California Emissions Estimator Model (CalEEMod), Version 2020.4.0. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. The methodology and assumptions used for the emissions calculations are identified in the Air Quality and Greenhouse Gas Emissions Assessment Letter (Appendix A); the CalEEMod output files are included in Attachment A to the letter.

To determine whether the project would (a) result in emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation, or (b) result in a cumulatively considerable net increase of PM_{10}, $PM_{2.5}$, or the ozone precursors NO_X and VOCs, emissions were evaluated based on the quantitative emission thresholds established by the SDAPCD. As part of its air quality permitting process, the SDAPCD has established thresholds in Rule 20.2 for the preparation of Air Quality Impact Assessments (AQIAs; SDAPCD 2020). In the absence of a significance threshold for $PM_{2.5}$ from the SDAPCD or the City, the SCAQMD’s screening threshold of 55 pounds per day or 10 tons per year was applied to this analysis (SCAQMD 2019). The screening thresholds are shown in Table 1, *Screening-level Thresholds for Air Quality Impact Analysis*.

Table 1
SCREENING-LEVEL THRESHOLDS FOR AIR QUALITY IMPACT ANALYSES

Pollutant	Total Emissions
Construction Emissions (Pounds per Day)	
Respirable Particulate Matter (PM_{10})	100
Fine Particulate Matter ($PM_{2.5}$)	55
Oxides of Nitrogen (NO_X)	250
Oxides of Sulfur (SO_X)	250
Carbon Monoxide (CO)	550
Volatile Organic Compounds (VOCs)	137
Toxic Air Contaminant Health Risk	
Excess Cancer Risk	1 in 1 million 10 in 1 million with T-BACT
Non-Cancer Hazard	1.0

Source: SDAPCD 2020; HELIX 2021
T-BACT = Toxics-Best Available Control Technology

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact. The SDAPCD is required, pursuant to the federal Clean Air Act, to reduce emissions of criteria pollutants for which the SDAB is in nonattainment. Strategies to achieve these emissions reductions are developed in the Attainment Plan and State Implementation Plan (SIP), prepared by the SDAPCD for the region. Both the Attainment Plan and SIP are based on regional population projections prepared by SANDAG, as well as land use designations and population projections included in general plans for those communities located throughout the County. Population growth is typically associated with the construction of residential units or large employment centers.

A project would be inconsistent with the Attainment Plan if it is inconsistent with the population and employment growth assumptions within the General Plan or if emissions would exceed the applicable thresholds. Construction of the project would not result in pollutant emissions in excess of applicable thresholds, as discussed under III.b, below. Because construction emissions would be below the applicable thresholds, and because the project would not result in population or employment increases with the replacement of an existing bridge, the project would not conflict with or obstruct implementation of the Attainment Plan for the SDAB and impacts would be less than significant.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Less Than Significant Impact. Air pollutant emissions generated from project construction activities would include:

- Dust (including PM_{10} and $PM_{2.5}$), primarily from fugitive sources such as soil disturbance and vehicle travel over unpaved surfaces;
- Combustion emissions of air pollutants (including VOC, NO_X, PM_{10}, $PM_{2.5}$, CO, and SO_X), primarily from operation of heavy off-road equipment; portable generators, pumps, and air compressor; on-road worker commute vehicles traveling to and from the project site; and trucks hauling equipment, material, and debris to and from the project site; and
- Emissions of VOCs from the application of asphalt and pavement marking.

The results of the air pollutant emissions calculations for project construction activities are shown in Table 2, *Maximum Daily Air Pollutant Emissions*. The data are presented as the maximum anticipated daily emissions for comparison with the SDAPCD thresholds (refer also to Table 1, above).

Table 2
MAXIMUM DAILY AIR POLLUTANT EMISSIONS
(pounds per day)

Construction Stage	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Stage 1	4.0	35.2	43.4	<0.1	3.1	1.8
Stage 2	21.6	33.5	44.6	<0.1	3.6	1.8
Stage 3	21.6	33.4	46.4	<0.1	3.6	1.8
Stage 4	2.3	16.9	24.5	<0.1	2.0	1.0
Stage 5	7.7	10.1	11.8	<0.1	1.2	0.6
Maximum Daily Emissions	**21.6**	**35.2**	**46.4**	**0.1**	**3.6**	**1.8**
SDAPCD Thresholds	*137*	*250*	*550*	*250*	*100*	*67*
Exceed Thresholds?	***No***	***No***	***No***	***No***	***No***	***No***

Source: CalEEMod (output data is provided in Attachment A to Appendix A), HELIX 2021
VOC = volatile organic compound; NO_X = nitrogen oxides; CO = carbon monoxide; SO_X = sulfur oxides;
PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter;
SDAPCD = San Diego County Air Pollution Control District

As shown in Table 2, project emissions would not exceed SDAPCD thresholds and would not result in a cumulatively considerable net increase of any criteria pollutant. Once operational, the new bridge would not result in an increase in traffic or associated changes to emissions compared to existing conditions. Therefore, impacts associated with air pollutant emissions would be less than significant.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. The closest sensitive receptors to the project site are single- and multi-family residences adjacent to Camino del Mar starting at the south end of the existing bridge near the lagoon. The closest school to the project site is the Saint James Academy, approximately 2,000 feet northeast of the intersection of Camino del Mar and Via de la Valle. There are no hospitals or day care centers within one mile of the project site.

Construction of the project would result in DPM associated with operation of construction equipment. The amount to which the receptors could be exposed, which is a function of concentration and duration of exposure, is the primary factor used to determine health risk. Current models and methodologies for conducting cancer health risk assessments are associated with longer-term exposure periods (typically 30 years for individual residents) and are best suited for evaluation of long duration TAC emissions with predictable schedules and locations. These assessment models and methodologies do not correlate well with the temporary and highly variable nature of construction activities. The total construction period would be approximately ~~27~~ 36 months. The most intense use of heavy equipment is anticipated to occur around the bridge in the lagoon and would not occur adjacent to any individual residence for extended periods of time. In addition, the prevailing ocean breezes would rapidly disperse emissions. Due to the variable and sporadic nature of construction activity, and the relatively short, anticipated construction schedule, the project's construction activity would not expose sensitive receptors to substantial concentrations of DPM. Therefore, project construction activities would not result in the exposure of sensitive receptors to substantial pollutant concentrations and impacts would be less than significant.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less Than Significant Impact. The State of California Health and Safety Code Sections 41700 and 41705, and SDAPCD Rule 51, commonly referred to as public nuisance law, prohibit emissions from any source whatsoever in such quantities of air contaminants or other material, which cause injury, detriment, nuisance, or annoyance to the public health or damage to property. It is generally accepted that the considerable number of persons requirement in Rule 51 is normally satisfied when 10 different individuals/households have made separate complaints within 90 days. Odor complaints from a "considerable" number of persons or businesses in the area would be a significant, adverse odor impact.

The project could produce odors during construction activities resulting from heavy diesel equipment exhaust and VOC released during application of paint or asphalt. Standard Best Management Practices (BMPs) to minimize equipment idling and maintain equipment would minimize the odor emissions from equipment exhaust and their associated impacts. The increase of construction odors would be minimal, as vehicle exhaust is already prevalent in the area due to vehicle traffic on Camino del Mar. Furthermore, odors emitted during construction activities would be temporary, short-term, and intermittent in nature, and would cease upon completion of construction. In addition, the prevailing ocean breezes would rapidly disperse odors. Operation of the project is not anticipated to result in emissions of objectionable odors. Therefore, odor impacts from implementation of the project would be less than significant.

IV. Biological Resources

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	■	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	■	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	■	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	■	☐	☐

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	■	☐	☐
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	■	☐	☐

The following discussion is based on the Biological Resources Letter Report (BLR) prepared by HELIX (HELIX 2022a) and included as Appendix B to this IS/MND.

Discussion

The biological study area evaluated in the technical analyses consists of a 200-foot-wide radius surrounding the proposed project work area (project site/boundary). The study area consists of developed lands in its northern and southern portions, including roadways and residential development. The western extent of the San Dieguito River occurs within the central portion of the study area, crossing underneath Camino del Mar Bridge prior to flowing into the Pacific Ocean. The bridge is located approximately 500 feet inland of the beach and extends over the mouth of the San Dieguito River. Lower elevation areas within the study area are subject to tidal influence based on elevation and proximity to the Pacific Ocean. This includes all marsh, estuarine and mudflat areas, and portions of beach adjacent to the San Dieguito River.

The following studies have been conducted within the study area: vegetation mapping; general botanical and zoological surveys; jurisdictional delineation; rare plant survey; and surveys for eelgrass (*Zostera marina*), killer algae (*Caulerpa taxifolia*), Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), California least tern (*Sternula antillarum browni*), coastal California gnatcatcher (*Polioptila californica californica*), Ridgway's rail (*Rallus obsoletus*), and western snowy plover (*Charadrius nivosus* ssp. *nivosus*). Information on the focused surveys conducted for the project to date are presented in Table 1 of the BLR (HELIX 2022). In addition to conducting biological surveys, a review of existing literature, previous reports (HELIX 2012 and 2015), and biological databases was conducted to identify the existence or potential occurrence of special-status biological resources (e.g., plants, animals, and vegetation communities) in or within the vicinity of the study area. Special-status species are those that are federally and/or state-listed, proposed for listing, or candidate species (CDFW 2021a); species listed as species of concern by the CDFW Special Animals List (CDFW 2021b) and Special Plants List (CDFW 2021c); and/or those species with a California Rare Plant Ranking (CRPR). Additionally, the USFWS' Information, Planning, and Conservation (IPaC) System website was used to generate a list of species to be considered in the effects analysis for the project (USFWS 2021).

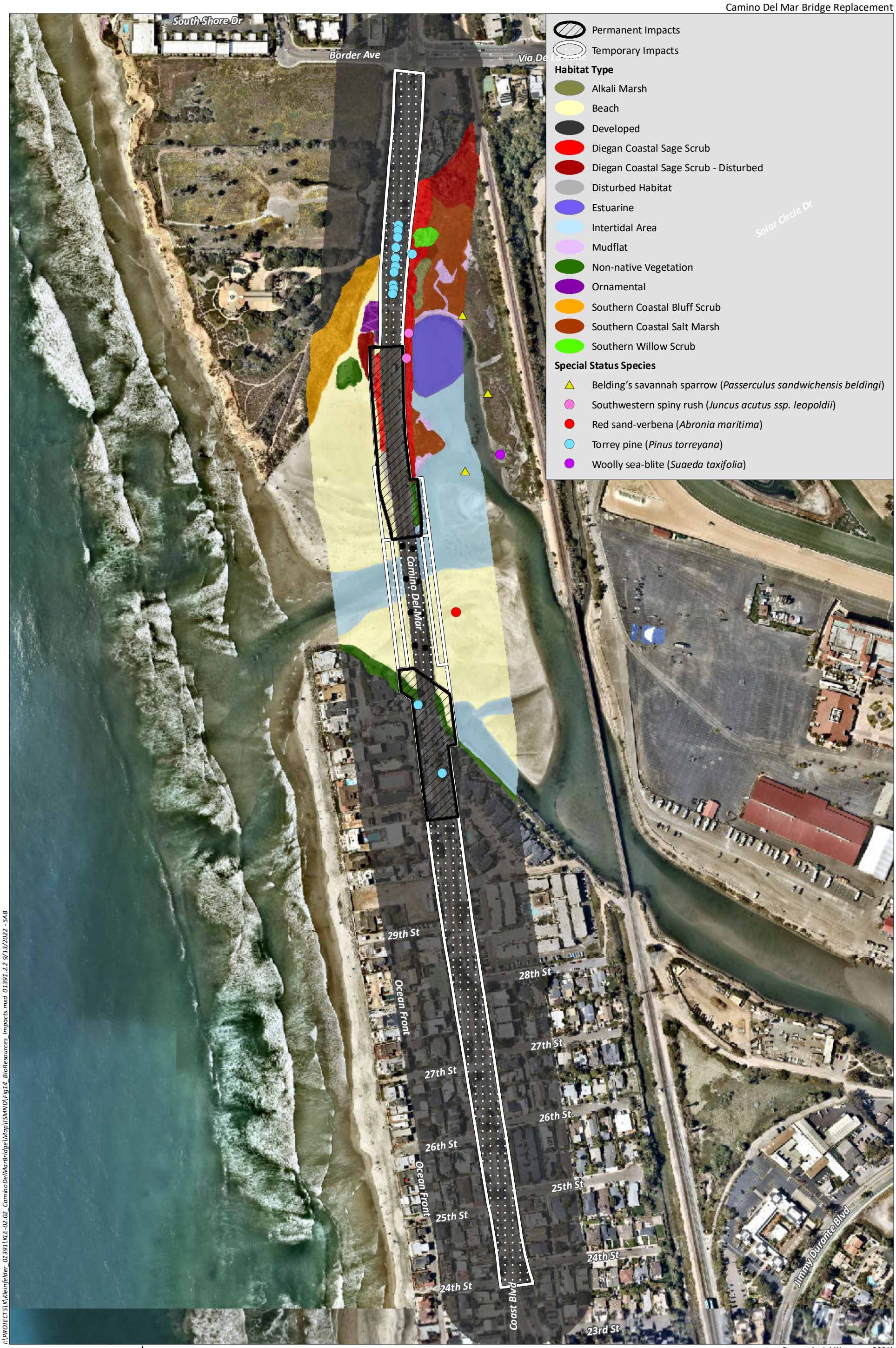
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less Than Significant with Mitigation Incorporated. The BLR investigated the potential impacts to special status plant and wildlife species in the vicinity of the project site resulting from implementation of the project. Special status species include those that have been afforded special status and/or recognition by federal or state resource agencies, as well as the California Native Plant Society (CNPS) for plant species (CNPS 2021). In general, the principal reason an individual taxon (species, subspecies, or variety) is given such recognition is the documented or perceived decline or limitations of its population size or geographical extent and/or distribution resulting in most cases from habitat loss. Comprehensive lists of sensitive plant and animal species observed or known to occur in the area is provided in the appendices to the BLR (HELIX 2022a; Appendix B to this IS/MND). A summary of the status of sensitive species within the project site and vicinity, as well as potential impacts to these species, is presented below.

Special Status Plant Species. As shown in Figure 14, *Vegetation Communities Within the Study Area*, ~~three~~ four sensitive plant species were detected within the study area: red sand-verbena (*Abronia maritima*), southwestern spiny rush (*Juncus acutus* var. *leopoldii*), ~~and~~ Torrey pine (*Pinus torreyana* ssp. *torreyana*), and woolly sea-blite (*Suaeda taxifolia*). ~~Although found present in the study area, none of these three plant species were detected within the project temporary or permanent impact footprints. No federally or state listed endangered or threatened plant species were found to be present in the study area during project-specific surveys. One Torrey pine was detected in the northern portion of the study area in Diegan coastal sage scrub habitat, just outside and to the east of the project footprint.~~ Five red sand-verbena were in beach habitat east of the bridge, outside of the impact area. Two individuals of southwestern spiny rush were detected in Diegan coastal sage scrub habitat outside of the project footprint. A total of 13 Torrey pine trees were found in the study area during surveys for the project; 1 tree located northeast of the bridge, 11 trees planted within the street center median landscaping (10 to the north and one to the south of the bridge), and 1 on the west side of Camino del Mar adjacent to the south end of the bridge. Based on a review of historical aerial imagery available online and the tree position in the landscape, these 13 trees seem to have been planted and are not naturally occurring. A single Woolly sea-blite was detected east of the bridge, outside of the impact area. No federally or state listed endangered or threatened or CRPR plant species were found to be present within the study area during project-specific surveys conducted in 2012, 2013, 2014, ~~and~~ 2018, and 2022.

Based on the species evaluations and results of focused rare plants surveys for the project, no additional sensitive plants are expected to occur on-site. Overall, special-status plant species were evaluated for potential to occur in the project study area based on the vegetation communities/habitat types present, soils and geographic location, sightings reported to the California Natural Diversity Database (CNDDB) and/or CNPS database, or documentation in nearby studies. Special-status plant species evaluated for the potential to occur at the project site are listed in the BLR (HELIX 2022a). Based on the species evaluations and results of focused rare plants surveys for the project, no additional sensitive plants are expected to occur on-site.

Two of the 13 Torrey pine trees located within the study area would be removed during project construction: one located on the west side of the roadway adjacent to the south end of the bridge and one within the Camino del Mar roadway median south of the bridge. These two trees are located within a public right-of-way and are isolated to a small area of the construction zone. Section 23.50.080 C.10 of the Del Mar Municipal Code allows the removal of a protected tree if the tree obstructs proposed improvements that cannot be reasonably designed to avoid the need for tree removal. In the context of the proposed project, tree removal is required in order to accommodate the necessary improvements



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0 300 Feet

Source: Aerial (Nearmap, 2021)

HELIX Environmental Planning

Vegetation Communities within the Study Area

Figure 14

required for the bridge removal and replacement with a structure that meets applicable public health and safety standards and protection from hazards (i.e., earthquakes, flooding, and sea level rise), while remaining within the existing bridge right-of-way, and not resulting in new off-site impacts.

With the exception of the two Torrey pine trees that would be removed, none of the other special-status plants were found to occur in areas where project impacts are proposed, and none are expected to occur. Mitigation measure AES-1 would apply excess credits from the City's Public Tree/Landscape Management program toward mitigation of the loss of the two Torrey pine trees. Therefore, ~~No temporary or permanent~~ potential impacts to special status plant species would ~~occur~~ be less than significant.

Special Status Animal Species. Five special status animal species were determined to have potential to occur within the study area, based on the habitat types present, geographic location, sightings reported to the CNDDB and/or USFWS databases, or documentation in nearby studies. Sensitive animal species with high potential to occur are those that nest and/or forage in sandy beaches, coastal marshes, and tidal areas. HELIX contacted NOAA NMFS in June 2022 to request an Endangered Species Act Species List for the project study area. Based on NOAA's review of the project, it was determined in July 2022 that no aquatic species listed for protection pursuant to the federal Endangered Species Act are expected to occur in the project area.

Focused surveys were conducted for Belding's savannah sparrow, California least tern, Ridgway's rail, and western snowy plover in 2012, ~~and~~ 2013, and 2022 by USFWS-permitted biologist John Konecny. Between March 8, 2018 and April 27, 2018, focused surveys for the Belding's savannah sparrow and Ridgway's rail were conducted at the study area (Konecny Biological Services 2018). Between March 2018 and April 2018, HELIX conducted focused surveys for the coastal California gnatcatcher. Additional focused surveys for special status animals have been conducted in 2022 and are currently in progress. One special-status animal species was detected on-site during surveys for the project; Belding's savannah sparrow. No other sensitive animal species were found to be present on site during project-specific surveys conducted in 2012, 2013, ~~and~~ 2018, and 2022. Three territories of the Belding's savannah sparrow were found east of the bridge during the 2013 surveys and two were observed east of the bridge in 2022; however, no individuals were observed during either surveys. Other than Belding's savannah sparrow, no other special-status animal species have been detected during focused surveys in 2022~~, which are currently in progress~~.

Implementation of the project is not anticipated to result in direct impacts to the State listed endangered Belding's savannah sparrow or its habitat/territory, as suitable nesting and foraging habitat for this species does not occur within the impact area. No other direct impacts to sensitive animal species are expected as a result of the project. Indirect impacts to Belding's savannah sparrow may occur if the species is present within suitable habitat adjacent to project construction activities. Specicially, construction-related noise could cause breeding birds to temporarily or permanently leave their territories to avoid disturbances from hunman activities, which could lead to reduced reproductive success and increased mortality. Noise effects would be considered potentially significant if noise levels generated during construction exceed a level of 60 A-weighted decibels (dBA) hourly average (L_{EQ}) or ambient (whichever is greater) adjacent to sensitive nesting bird species such as Belding's savannah sparrow. During construction, up to ~~12~~ 14 temporary night closures of the bridge during the ~~27~~ 36-month construction period are expected during which lighting would be needed. Night lighting that extends onto adjacent wildlife habitat can discourage use of the habitat by nocturnal wildlife and can also provide nocturnal predators with an unnatural advantage over their prey, resulting in a potentially

significant impact. Temporary lighting would be required to be oriented downward (toward the bridge deck) and the lighting source would be required to be shielded in order to minimize light spill and avoid adverse effects on adjacent wildlife habitat. With the implementation of mitigation measures BIO-1 and BIO-2 potential indirect impacts to Belding's savannah sparrow would be avoided or reduced to below a level of significance.

Given the location of the project within the San Dieguito River, there are a variety of birds that migrate seasonally through the project area on the Pacific flyway, as well as certain birds that permanently reside locally. Pursuant to the Migratory Bird Treaty Act (MBTA), development of the proposed project could disturb or destroy active migratory bird nests if vegetation clearing occurs during the general bird nesting season (February 15 through September 30) and/or raptor nesting season (January 15 through July 31). Disturbance to or destruction of migratory bird nests are in violation of the MBTA and are, therefore, considered to be a potentially significant impact. Implementation of mitigation measure BIO-3 would ensure that potential impacts to birds protected under the MBTA and California Fish and Game Code are avoided during construction.

Mitigation Measures

BIO-1 Pre-construction Protocol Surveys and Listed Species Avoidance. In preparation for construction and to confirm the presence or absence of Belding's savannah sparrow, a pre-construction survey shall be conducted one year prior to construction ~~If construction activities are scheduled to start during the breeding season for Belding's savannah sparrow (February~~ (March 15 to June 30), ~~a qualified biologist shall conduct pre-construction surveys to determine the presence or absence of this species. The final survey shall not be completed more than three days prior to the beginning of construction or grading activities. If it is determined at the completion of pre-construction surveys that active nests belonging to this species are absent within 300 feet of construction, construction shall be allowed to proceed~~. If Belding's savannah sparrow is detected within 300 feet of the project impact footprint ~~during pre-construction surveys~~, the City shall notify CDFW, and if required by CDFW, shall prepare and submit an application for a Section 2081(b) Incidental Take Permit for impacts to Belding's savannah sparrow prior to construction. If it is determined by the survey that active territories for Belding's savannah sparrow are absent within 300 feet of construction, then construction shall be allowed to proceed.

If results of the pre-construction survey discussed above conclude Belding's savannah sparrow is absent, a subsequent survey shall be conducted prior to work if construction is scheduled to commence between March 15 and June 30 (i.e., breeding season for Belding's savannah sparrow) to ensure the absence of this species. If ~~pre-construction~~ this subsequent survey~~s determine the presence of~~finds active ~~nests~~ nesting territories belonging to this species ~~within 300 feet of construction~~, then construction shall: (1) be postponed until a qualified biologist determines the nest(s) is no longer active or until after the respective breeding season; ~~or~~ (2) not occur until a temporary noise barrier or berm is constructed at the edge of the development footprint and/or around construction equipment to the satisfaction of the project biologist; and/or (3) shall be postponed until consultation with CDFW to address protection of this species has been completed by the City~~. to ensure that noise levels are reduced to below 60 dBA L_{EQ} (one hour average) or ambient. Decibel output shall be confirmed by a qualified noise specialist, and intermittent monitoring by a qualified biologist shall be required to ensure that conditions have not changed.~~

BIO-2 Construction Noise Abatement. If noise-generating construction activities are not completed prior to the breeding season for Belding's savannah sparrow (~~February~~ March 15 through June 30) and this species is found present during the pre-construction surveys completed in accordance with **BIO-1**, then appropriate noise attenuation measures shall be implemented to reduce construction noise levels at the edge of occupied habitat to below 60 dBA L_{EQ} (one hour average). Such measures shall include, but not be limited to, the following:

- Construction equipment shall be properly outfitted and maintained with manufacturer-recommended noise-reduction devices.
- Diesel equipment shall be operated with closed engine doors and equipped with factory-recommended mufflers.
- Mobile or fixed "package" equipment (e.g., arc-welders and air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
- Electrically powered equipment shall be used instead of pneumatic or internal- combustion powered equipment, where feasible.
- Unnecessary idling of internal combustion engines (e.g., in excess of 5 minutes) shall be prohibited.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.
- No project-related public address or music system shall be audible at any adjacent sensitive receptor.
- Temporary sound barriers or sound blankets shall be installed between construction operations and adjacent noise-sensitive habitat. The project Contractor shall construct a temporary noise barrier at least 6 feet in height meeting the specifications listed below (or of a Sound Transmission Class 19 rating or better) to attenuate noise.
- All barriers shall be solid and constructed of wood, plastic, fiberglass, steel, masonry, or a combination of those materials, with no cracks or gaps through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove or close butted seams and must be at least 3⁄4-inch thick or have a surface density of at least 3.5 pounds per square-foot. Sheet metal of 18-gauge (minimum) may be used if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Noise blankets, hoods, or covers also may be used, provided they are appropriately implemented to provide the required sound attenuation.

BIO-3 Nesting Bird and Raptor Avoidance. In order to avoid violation of the federal MBTA and California Fish and Game Code, site-preparation activities (removal of trees and vegetation) shall be avoided during the general avian breeding season (January 15 to July 30 for raptors; February 15 to September 30 for other avian species).

If site-preparation activities are to occur during the general avian or raptor breeding season, a pre-construction nesting survey shall be conducted within ~~30~~ three days prior to the commencement of construction. A qualified biologist shall perform the nesting survey to ascertain whether there are active raptor nests or sensitive avian species nesting within 500 feet of the project footprint and/or other bird nests within 300 feet of the project footprint. This survey shall identify the species of nesting bird and to the degree feasible, nesting stage (e.g., incubation of eggs, feeding of young, near fledging). Nests shall be mapped (not by using GPS because close encroachment may cause nest abandonment). If the surveys conclude no active nesting, the work shall resume as planned. If project activities are delayed or suspended for more than five days during the breeding season, surveys shall be repeated prior to re-initiating work. ~~A follow-up nesting survey shall be conducted no more than three days prior to clearing.~~ If an active nest is observed, the nest location shall be fenced off surrounding an adequate radius buffer zone as determined by biological monitor. Buffer distances may include, but shall not be restricted to, 100 feet around non-listed active passerine (e.g., perching birds and songbirds) nests and 300 feet around listed passerine (e.g., Belding's savannah sparrow) nests. The buffers may be reduced, if appropriate, and as directed by a qualified biologist. The reduction in no-work buffers shall be approved by the City prior to implementation. ~~This~~Each nest avoidance buffer zone shall not be disturbed until a qualified biologist has verified that the young have fledged or the nest has otherwise become inactive.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less Than Significant with Mitigation Incorporated. Sensitive vegetation communities/habitat types are defined as land that supports unique vegetation communities, or the habitats of rare or endangered species or subspecies of animals or plants as defined by CEQA Guidelines Section 15380. They are considered sensitive because they have been depleted, are naturally uncommon, or support sensitive species. Within the project study area, nine sensitive vegetation communities and habitat types were identified: alkali marsh, beach, Diegan sage scrub (including disturbed), estuarine, intertidal area, mudflat, southern coastal bluff scrub, southern coastal marsh, and southern willow scrub. Developed land, disturbed habitat, ornamental, and non-native vegetation are not considered sensitive vegetation/ habitat under CEQA. A full description of each vegetation community is provided in the BLR. Existing vegetation communities within the study area are shown in Figure 14 and Table 3, *Existing Vegetation Communities and Land Use Cover Types Within the Study Area*.

Table 3
EXISTING VEGETATION COMMUNITIES AND HABITAT TYPES WITHIN THE STUDY AREA (acre)*

Vegetation Community or Habitat Type[2]	Acreage
Sensitive	
Alkali Marsh 52300	0.12
Beach 64400	7.26
Diegan Coastal Sage Scrub (including disturbed) 32500	1.69
Estuarine 64130	0.93
Intertidal Area (Open Water) 64112	4.39
Mudflat 64300	0.26
Southern Costal Bluff Scrub 31200	1.24
Southern Coastal Salt Marsh 52120	1.02
Southern Willow Scrub 63320	0.10
Subtotal	17.01
Non-Sensitive	
Developed 12000	34.72
Disturbed Habitat 11300	0.05
Non-native Vegetation 11000	0.68
Ornamental N/A	0.15
Subtotal	35.60
TOTAL	**52.61**

Source: HELIX 2022a

*Rounded to the nearest 0.01; thus, total reflects rounding.

[1] Vegetation categories and numerical codes are from Holland (1986) and Oberbauer (2008) and are listed by Habitats and Tiers within the County Multiple Species Conservation Program (County MSCP; County 1998).

No impacts to riparian habitat would occur as a result of the project; however, temporary and permanent direct impacts to other sensitive natural communities/habitats would occur, including beach, Diegan coastal sage scrub (including disturbed), intertidal (open water), and mudflat. Permanent impacts by the project would consist of direct effects resulting from bridge replacement and associated structures that would alter the pre-construction condition permanently, whereas temporary impacts reflect areas of the project that would be directly impacted but replaced to a pre-construction condition following construction. Table 4, *Project Impacts to Sensitive Natural Communities*, provides the quantities of proposed project impacts and Figure 14 presents the spatial distribution of project impacts.

Table 4
PROJECT IMPACTS TO SENSITIVE NATURAL COMMUNITIES (acre)*

Vegetation Community or Habitat Type	Temporary Impacts	Permanent Impacts	Total Impacts
Beach	0.88	0.36	1.24
Diegan Coastal Sage Scrub (including disturbed)	0.02	0.16	0.18
Intertidal (Open water)	0.41	0.04	0.45
Mudflat	0.00	<0.01	<0.01
TOTAL	**1.31**	**0.56**	**1.87**

Source: HELIX 2022a

*Acreages are rounded to the nearest 0.01.

While the project has been designed to minimize impacts to sensitive natural communities/habitats to the greatest extent practicable, direct impacts could not be completely avoided due to the location of the bridge structures in relation to existing natural resources. Direct impacts to intertidal open water, mudflat, and beach habitats would occur during the removal of the existing bridge pilings and replacement of new piers. However, removal of the existing pilling structures, which are greater in quantity and diameter than the piers proposed for the replacement bridge, would result in a net environmental benefit due to the expected uplift and improvement on tidal circulation and related functions. Additionally, the ebb and flow of tidal current under the bridge would be enhanced due to the fewer number and smaller size of piers being installed for the replacement bridge, which would result in more natural tidal flows compared to that which currently exists. In addition, the construction activities within the intertidal open water habitat are temporally and spatially a minor undertaking and would not entail a long-term construction phase. Tidal flow beneath the bridge would be maintained during construction. Ultimately, such direct impacts to intertidal open water are considered less than significant and no mitigation is proposed. Additionally, direct impacts to less than 0.01-acre of mudflat (approximately 40 square feet) adjacent/below the bridge are considered less than significant. Because the beach habitat is primarily unvegetated, the proposed direct impacts would result in relatively minor surface disturbance, and impacted areas of the beach would be rehabilitated and recontoured to restore it to natural sand grade and pre-construction conditions. Impacts are considered less than significant and no mitigation to beach is proposed.

Direct impacts (permanent and temporary) to relatively narrow strips/patches of Diegan coastal sage scrub located alongside Camino del Mar, north of the bridge, would occur as a result of the project. Permanent impacts to Diegan coastal sage scrub would be considered significant and would require mitigation. A 2:1 mitigation ratio is proposed for permanent impacts to Diegan coastal sage scrub. Mitigation would occur through on-site or off-site restoration, enhancement, and/or establishment/re-establishment with a minimum 1:1 establishment/re-establishment component (due to Coastal Zone requirements and to ensure no-net-loss), or the purchase of credits at an approved mitigation bank.

Temporary impacts to Diegan coastal sage scrub would be replaced/restored to previous (pre-construction) condition or better (biologically equivalent or superior in function). By restoring this habitat to pre-construction condition or better, the temporary impacts would be considered less than significant; thus, no mitigation is proposed. If restoration to pre-construction condition or better is not completed, the impacts by the project would be considered significant. To ensure replacement of temporary impact areas, a conceptual habitat restoration plan would be required for the project to address/replace temporary impacts to Diegan coastal sage scrub.

Potential indirect impacts to natural communities as a result of the project are not expected. Appropriate and typical construction BMPs would be selected and installed for the project per compliance with NPDES and Storm Water Quality Management Plan (SWQMP) requirements prior to the on-set of construction activities and throughout construction to reduce potential water quality impacts, as described under the Construction Methods and Phasing discussion in Section 1.1 ~~These may include, but not limited to: (1) installing erosion and sediment control devices such as silt fences, fiber rolls, bonded fiber matrix, and gravel bags in appropriate locations; (2) placing temporary filters at storm drain inlets (e.g., gravel bags/filter fabric); (3) designating containment areas for material storage (e.g., covering/berming of soil stockpiles); and (4) providing containment areas for solid waste storage and concrete washout~~.

Mitigation for permanent impacts to 0.16 acre of Diegan coastal sage scrub may occur on- or off-site using habitat mapped as disturbed, non-native vegetation, and/or ornamental. A total of 0.37 acre of these habitat types was identified in the study area and could be available for potential Diegan coastal sage scrub establishment/re-establishment, which would meet the 1:1 establishment/re-establishment requirement. Potential Diegan coastal scrub enhancement is also available, totaling approximately 0.75 acre. This is greater than the 0.32-acre mitigation required. Implementation of mitigation measure BIO-4 would ensure that impacts to sensitive natural vegetation communities would be reduced to less than significant.

Mitigation Measures

BIO-4 **Habitat Restoration Plan.** The City shall prepare and implement a habitat restoration plan. Temporary impacts to 0.02 acre of Diegan coastal sage scrub shall be restored to a pre-construction or superior condition at a 1:1 replacement within the area impacted. Permanent impacts to 0.16 acre of Diegan coastal sage scrub shall be mitigated at a 2:1 ratio. Mitigation shall occur through on- or off-site restoration, enhancement, and/or establishment with a minimum 1:1 establishment component, or the purchase of credits at an approved mitigation bank. Mitigation may occur on- or off-site by converting habitat that has been mapped as disturbed, non-native vegetation, and/or ornamental into native habitat. The habitat restoration plan shall be submitted to CDFW for review and concurrence prior to ground disturbance that may impact Diegan coastal sage scrub. Mitigation located outside of the Coastal Zone shall require approval by the City and CCC, as well as other applicable agencies such as the CDFW.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?

Less Than Significant with Mitigation Incorporated. A field-based jurisdictional delineation was conducted by HELIX within an approximately 52.6-acre study area in order to identify and map the approximate extent of existing aquatic resources potentially subject to the regulatory jurisdiction of the USACE pursuant to Section 404 of the Clean Water Act (CWA; 33 USC 1344); waters of the state potentially subject to the regulatory jurisdiction of the RWQCB pursuant to Section 401 of the CWA and the Porter Cologne Water Quality Control Act; stream and riparian habitats potentially subject to the jurisdiction of CDFW pursuant to Section 1602 of the Fish and Game Code; and coastal wetlands potentially subject to the jurisdiction of the CCC pursuant to the California Coastal Act. The descriptions and maps provided in the project ARDR represent HELIX's recommendation based on the information available at the time of the delineation; the final determination on the extent of features subject to jurisdiction are subject to USACE, RWQCB, CDFW, and/or CCC regulation would be made by the regulatory agencies during permitting.

Approximately 12.83 acres of potentially jurisdictional waters of the U.S. were identified in the project study area (Figure 15, *Waters of the United States*), consisting of 1.71 acres of wetlands/special aquatic sites and 11.12 acres of non-wetland waters. Areas considered waters of the U.S. may be subject to USACE and RWQCB jurisdiction. These 12.83 acres as well as an additional 0.01-acre are also considered potentially jurisdictional habitats and coastal wetlands, under jurisdiction of CDFW and California Coastal Commission, respectively (Figure 16, *CDFW Jurisdiction*, and Figure 17, *California Coastal Commission Wetlands*). Specifically, these areas consist of 1.72 acres of wetlands/special aquatic sites and 11.12 acres of non-wetland waters. Potentially jurisdictional aquatic resources are presented below

in Table 5, *Potentially Jurisdictional Aquatic Resources Summary.* No isolated waters potentially subject to RWQCB jurisdiction were detected in the study area; thus, no areas of jurisdiction that are exclusively regulated by the RWQCB under the Porter-Cologne Water Quality Control Act are present. The final determination on the extent of features subject to jurisdiction are subject to USACE, RWQCB, CDFW, and/or Coastal Commission regulation would be made by these agencies during regulatory permitting for the project.

Table 5
POTENTIALLY JURISDICTIONAL AQUATIC RESOURCES SUMMARY

Vegetation Community or Habitat Type	USACE Waters of the U.S.[1,2]	CDFW Jurisdiction and Coastal Wetlands[1]
Special Aquatic Sites including Wetlands		
Alkali Marsh	0.12	0.12
Mudflat	0.26	0.26
Southern Coastal Salt Marsh	1.23	1.24
Southern Willow Scrub	0.10	0.10
Subtotal	**1.71**	**1.72**
Non-wetland Waters		
Beach	5.60	5.60
Estuarine	0.92	0.92
Intertidal	4.60	4.60
Subtotal	**11.12**	**11.12**
TOTAL	**12.83**	**12.84**

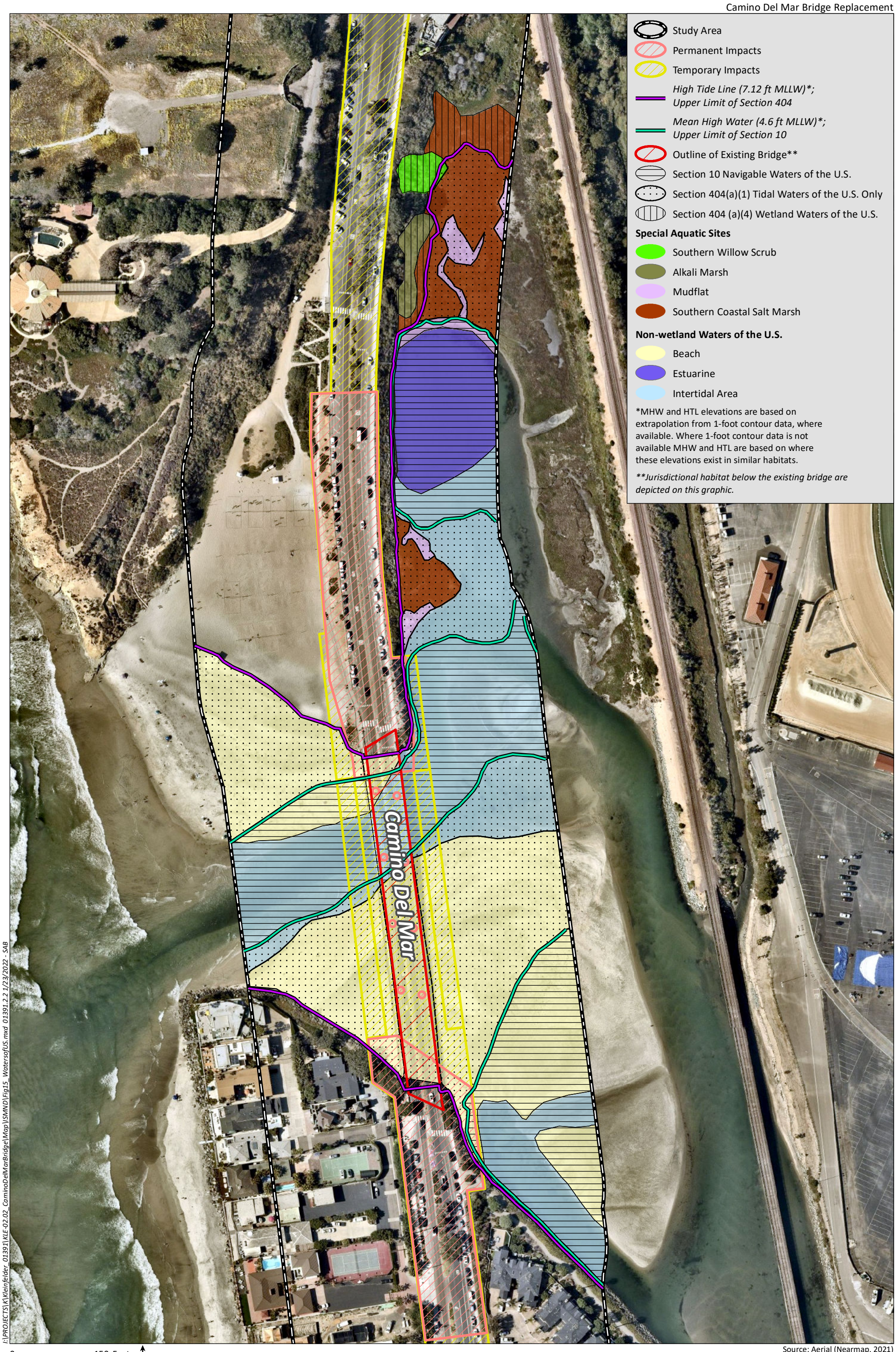
Source: HELIX 2022a

[1] Acreage rounded to the nearest 0.01.

[2] Potentially subject to RWQCB jurisdiction.

The project would result in impacts to wetlands defined by Section 404 of the CWA. Approximately 2.21 acres of direct impacts to intertidal open water, mudflat, and adjacent beach would occur as a result of the project. These direct impacts consist of approximately ~~1.90~~ 1.89 acres of temporary impacts and approximately ~~0.31~~ 0.33-acre permanent impacts during the removal of existing bridge components and replacement with a new bridge (Table 6, *Project Impacts to Potentially Jurisdictional Aquatic Resources*). Although permanent impacts would occur, ultimately the project would result in a smaller footprint within the jurisdictional area through the removal of existing bridge components and replacement with fewer piers. As a result, there would be a net gain in open intertidal water upon completion of the project and enhanced aquatic functions (e.g., improved tidal/flood processes, increased water column, expansion of benthic habitat, etc.).

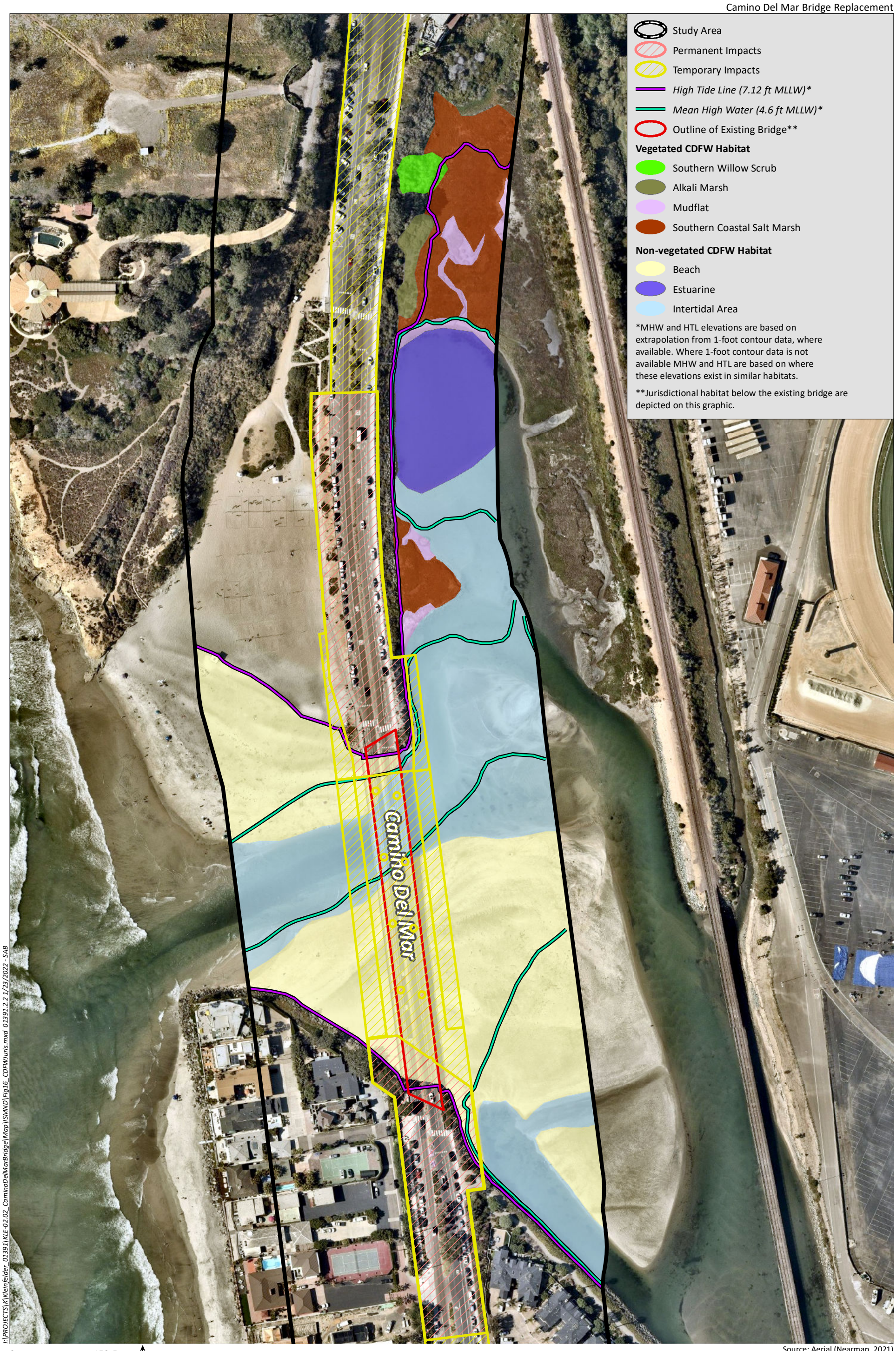
Direct temporary impacts would primarily be for construction access and would be restored to pre-project conditions; permanent impacts would be negligible to these unvegetated habitats. The localized nature of the activities means that the temporal and spatial impacts to the surrounding environment from the replacement of the pilings are negligible. In addition, as stated above, the removal of the larger diameter existing pilings and replacement with structures with lesser girth is expected to improve tidal circulation and create a better tidal circulation, thus offsetting temporary impacts. The beach environment is unvegetated and impacts from project activities are expected to be surficial. Replacement of the beach environment to pre-project condition by stabilizing it and contouring as a part of project design is expected to offset temporary impacts. Overall, because the project would result in a



HELIX Environmental Planning

Waters of the United States

Figure 15



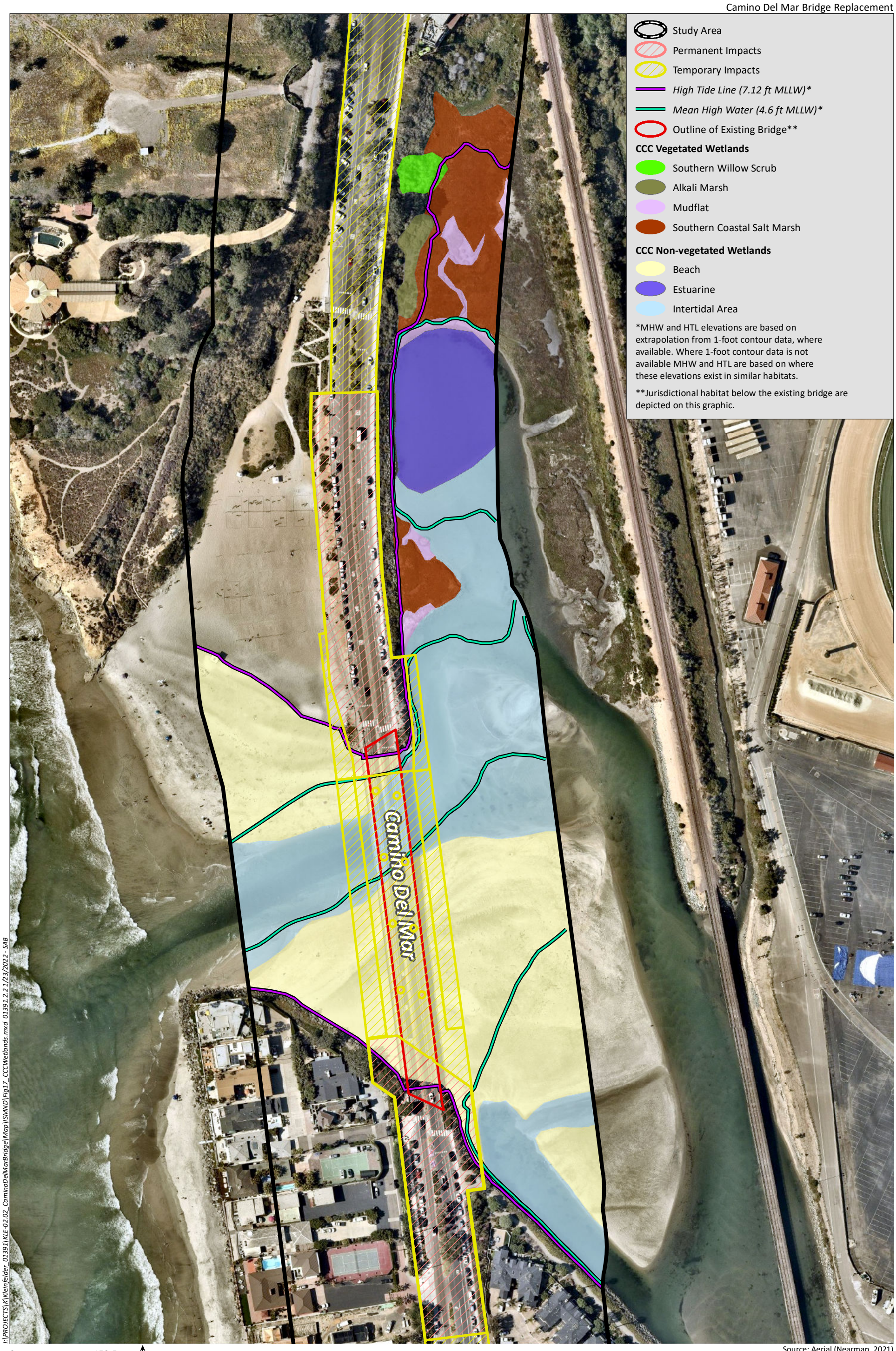
Source: Aerial (Nearmap, 2021)

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HELIX Environmental Planning

CDFW Jurisdiction

Figure 16



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HELIX Environmental Planning

California Coastal Commission Wetlands

Figure 17

smaller development footprint and provides increased function and value, project impacts are considered less than significant.

Although the project was designed and sited to avoid and minimize impacts to jurisdictional resources to the extent practicable, the project would impact potentially protected wetlands and waters under Section 404 of the CWA subject to the jurisdiction of the USACE. The project would also result in impacts to potentially jurisdictional waters of the state subject to jurisdiction by the RWQCB under Section 401 of the CWA and protected streambed and associated riparian habitat under the jurisdiction of the CDFW per Section 1602 of the California Fish and Game Code. Lastly, project construction would result in impacts to wetlands subject to the permit authority of the CCC. Table 6 depicts the potential impacts to jurisdictional waters under the purview of the USACE, RWQCB, CDFW, and CCC.

Table 6
PROJECT IMPACTS TO POTENTIALLY JURISDICTIONAL AQUATIC RESOURCES[1]

Vegetation Community or Habitat Type	USACE / RWQCB / CDFW / CCC Jurisdiction		
	Temporary Impacts	Permanent Impacts	Total Impacts
Beach	1.28	0.29	1.57
Intertidal (Open Water)	0.60	~~0.05~~0.04	~~0.65~~0.64
Mudflat	0.00	<0.01	<0.01
TOTAL	**~~1.90~~1.88**	**~~0.31~~ 0.33**	**2.21**

[1] Acreages rounded to the nearest 0.01.

Impacts to areas regulated under the CWA could require regulatory permitting by the USACE under Section 404 of the CWA and are expected to be authorized by the USACE under Nationwide Permit 14 (Linear Transportation Projects). In addition to a USACE Nationwide Permit, the RWQCB may require a Water Quality Certification pursuant to Section 401 of the CWA. Impacts to areas under the jurisdictional authority of the RWQCB would be the same as that of the USACE. Additionally, such impacts to intertidal open water, mudflat, and adjacent beach would be under jurisdictional authority of CDFW pursuant to the CFGC, and CDFW could require a Streambed Alteration Agreement.

Furthermore, these project impacts would also include CCC jurisdictional areas, and CCC would require the issuance of a CDP from the CCC and/or the City. Coordination between the City and CCC has occurred during regularly scheduled interagency meetings; topics of discussion for this project have included conducting pre-construction exploratory borings at future abutment locations and review of bridge design scenarios accounting for projected flooding and sea level rise.

Final requirements for regulatory permits for impacts to open water and jurisdictional beach habitat would be determined in consultation with the resource agencies (i.e., USACE, RWQCB, CDFW, and CCC). In addition to permits, the resource agencies may require mitigation for project impacts Implementation mitigation measure BIO-5 would verify whether regulatory permits and/or mitigation would be required by the resource agencies and ensure that potential temporary and permanent impacts to jurisdictional aquatic resources would be less than significant.

Mitigation Measures

BIO-5 Regulatory Permits. Prior to project impacts to potentially jurisdictional resources, demonstration that regulatory permits from USACE, RWQCB, CDFW, and CCC, have been issued

or that no such permits are required shall be provided to the City. Implementation of permit requirements, including additional mitigation, shall be required.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less Than Significant with Mitigation Incorporated. The San Dieguito River lagoon outlets into the Pacific Ocean approximately 400 feet west of the bridge. The San Dieguito River and the associated lagoon area is mapped as a Biological Core Area in the Final County Multiple Species Conservation Plan (MSCP), which are defined as areas generally supporting high concentrations of sensitive biological resources which, if lost or fragmented, could not be replaced or mitigated elsewhere (County 1998). The San Dieguito River and San Dieguito Lagoon provide regionally important feeding and resting areas for migratory birds along the Pacific Flyway, as well as tidal, open water, mudflat, and salt marsh habitats that support a variety of birds, fishes, and invertebrates. Eastward movement of terrestrial wildlife from the study area is constrained by the State Fairgrounds and developed areas around it. The river is highly constrained for the approximately 0.5-mile reach situated between Camino del Mar, eastward past the railroad tracks to Jimmy Durante Boulevard. More extensive areas of native habitat occur east of Jimmy Durante Boulevard on both sides of I-5.

While the project site and immediately adjacent native habitats associated with the lagoon support localized use by wildlife, particularly marine birds and some common urban mammal species (e.g., raccoon [*Procyon lotor*], opossum [*Didelphis virginiana*], coyote [*Canis latrans*], and skunk [*Mephitis mephitis*), the project site does not function as a wildlife corridor/habitat linkage for non-avian terrestrial wildlife due to its relatively small size and constrained connectivity to larger habitat areas (i.e., narrow river connection with development abutting both edges of the open water).

Relative to potential interference with the movement of native resident or migratory fish, construction of the replacement bridge would temporarily disturb benthic and aquatic habitats within the lagoon. Although no special-status fish species are expected to occur in the study area, multiple common fish species managed by the NOAA NMFS Pacific Fishery Management Council may occur in the study area. These fish species include northern anchovy (*Engraulis mordax*); California grunion (*Leuresthes tenuis*); and Pacific Coast groundfish species such as California halibut (*Paralichthys californicus*), California skate (*Raja inornate*), leopard shark (*Triakis semifasciata*), and speckled sanddab (*Citharichthys stigmaeus*). Construction impacts would occur to primarily unvegetated soft-bottom habitat, which typically recovers faster than more sensitive benthic environments. Although impacts would occur as a result of bridge replacement, the project ultimately provides a net increase of subtidal habitat via the reduction of pilings/piers from ~~twelve~~ 10 associated with the existing bridge to ~~four~~ 4 proposed for the new bridge. Construction would result in temporary and short-term impacts to tidal areas beneath and adjacent to the bridge; however, substantial impacts to tidal flow are not anticipated and tidal circulation and related functions under the bridge would be enhanced. Overall, the project is expected to result in a long-term net environmental/ecological benefit to the San Dieguito River mouth and its associated habitats. In order to further reduce potential temporary effects to aquatic and benthic habitats and passage of fish species through the project site, BMPs would be employed to address indirect effects related to water quality and hydroacoustic and vibration effects (refer to the discussion of Construction Methods and Staging discussion in Section 1.1). Construction personnel would consult the Caltrans Construction Best Management Practices Manual (Caltrans 2017) to determine the appropriate BMPs for application in a tidal environment.

Although substantial impacts would not occur, the presence of subtidal and intertidal marine vegetation within the lagoon provides habitat for fish species and fish movement, including the species noted above. To evaluate potential impacts to fish movement and habitat, waters within 150 feet of the bridge were surveyed by Merkel & Associates in September 2018 for the presence of eelgrass (*Zostera marina*). Eelgrass within the survey area consisted of narrow marginal eelgrass beds extending along the shoreline between the deeper water areas and the beach and revetted shoreline northwest and southwest of the bridge (Merkel & Associates 2018). Eelgrass identified during the surveys was located in areas that would be avoided and protected in place during construction, thus avoiding potential impacts to fish or other aquatic species. Because eelgrass is a dynamic habitat type that is continuously changing in density, biomass, and distribution and has the potential to occur within the project footprint at the time of construction, preconstruction eelgrass surveys would be conducted and applicable mitigation per the Southern California Eelgrass Mitigation Policy would be implemented should the project impact eelgrass ~~be impacted by the project~~. With implementation of mitigation measure BIO-6, the project would not interfere with wildlife movement or impede the use of nursery sites and impacts would be less than significant.

BIO-6 Eelgrass Avoidance and Mitigation. A pre-construction eelgrass survey shall be conducted in accordance with NOAA Fisheries California Eelgrass Mitigation Policy and Implementation Guidelines. If the pre-construction survey demonstrates eelgrass presence within the 100 feet of the construction footprint, then a mitigation plan to achieve no net loss in eelgrass function shall be developed and conducted in accordance with the California Eelgrass Mitigation Policy and Implementation Guidelines. The mitigation plan shall be reviewed and approved in consultation with NOAA Fisheries prior to project impacts to eelgrass. Mitigation options include (1) development of comprehensive management plans that protect eelgrass resources within the context of broader ecosystem needs and management objectives; (2) in-kind compensatory mitigation (e.g., creation, restoration, or enhancement of the same habitat type to mitigate for adverse impacts) that achieves a minimum final mitigation ratio of 1.38:1 once mitigation is complete (3) credits purchased through a mitigation bank or in-lieu fee program at a 1:1 ratio where the credits have been established for a full three-year period prior to use (or higher ratio should the bank credits have been in place for a period less than three years); (4) out-of-kind compensatory mitigation (e.g., creation, restoration, or enhancement of another habitat type to mitigate for adverse impacts) that demonstrates to the satisfaction of NOAA Fisheries such that it can be demonstrated that the proposed mitigation will compensate for the loss of eelgrass habitat function within the ecosystem; or (5) alternate mitigation recommendations provided by NOAA Fisheries that will achieve no net loss.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Less Than Significant with Mitigation Incorporated. The project is located within the City's Lagoon Overlay Zone (LO-Z), which guides development within areas identified as "wetlands" and "wetland buffer areas." To the extent practicable, the project has been sited and designed to occur within and immediately adjacent to the existing roadway/edge, outside of areas in which plant or animal life and their habitats are rare or especially valuable because of their special nature or role in an ecosystem, and in areas currently subject to disturbance or degradation by human activities and developments. The biological resources within the project site are in narrow strips of vegetation (native and non-native uplands) directly adjacent to the existing Camino del Mar Bridge and are currently subject to disturbance from vehicle traffic, noise, and pedestrian/bicycle activities. Project consistency with the

City's Municipal Code and LO-Z was considered as a guide for the proposed design and project design was modified to avoid wetland areas to the extent practicable. As described in IV.d, the project would result in temporary and permanent impacts to jurisdictional resources, which would conflict with the permitted activities within the City's LO-Z as development in wetland habitat is prohibited. Although the project would conflict with the City's LO-Z that protects biological resources in the Lagoon, physical impacts on biological resources, including wetlands, would be less than significant with implementation of mitigation measure BIO-5.

The City's Municipal Code also includes a tree preservation/protection Ordinance. This ordinance protects Torrey pines, Monterey Cypress (*Cupressus macrocarpa*), and trees of any species that are located in the public right-of-way. Permits to remove protected trees are typically granted or denied by the Director of Planning and Community Development reflecting associated mitigation requirements within an approved Tree Removal Permit. Pursuant to Section 23.050.070, the Design Review Board is responsible for administering and enforcing this DMMC chapter when a request for a Tree Removal Permit is a direct result of a concurrent development permit application reviewed by the Design Review Board, with powers to grant or deny the permit, as well as determination of mitigation requirements. For City projects, the City Council is the decision maker. The affected trees located within the project footprint are isolated to a small area of the construction zone: one Torrey pine is located southwest of the southern bridge abutment and six trees (including one Torrey pine) are within the Camino del Mar roadway median south of the bridge, adjacent to residential plantings (including trees) on either side of the road. The trees are within public right-of-way and their removal is required in order to allow bridge removal and replacement. Consistent with DMMC Section 23.50.090, the impacts/loss of these trees would be mitigated. As proposed, two new street canopy trees would be installed within Greet Streets tree wells. Additional mitigation to cover the loss of street trees would be covered by the City's Public Tree/Landscape Management program that is administered by the City of Del Mar Public Works Department. With implementation of mitigation measure AES-1 addressing removal and replacement of on-site trees, and implementation of regulatory permitting with the resource agencies (BIO-5), impacts associated with policy and ordinance compliance would be less than significant.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Less Than Significant with Mitigation Incorporated. The project does not occur within the boundaries of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan. Therefore, no impact would occur.

The City of Del Maris located within the boundaries of the County MSCP (County 1998). The MSCP is a multi-jurisdictional planning program designed to develop an ecosystem preserve within San Diego's incorporated and unincorporated areas. While the MSCP has been adopted for the County, no subarea plan has been approved or adopted for Del Mar. Therefore, the draft policies and guidelines of these plans are not applicable to the project. The project, however, considered the context of such draft plans and implementation of the proposed project would not preclude or prevent finalizing and adopting the plan. Compliance with existing regulations and implementation of measures BIO-1 through BIO-6 would ensure consistency with the general conservation goals and objectives of the County MSCP.

V. Cultural Resources

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☐	■
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	■	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	■	☐

The following discussion is based on the Archaeological Survey Report prepared by HELIX (2022b) and included as Appendix C (Confidential) to this IS/MND.

Discussion

The Archaeological Survey Report prepared for the proposed project includes the results of a records search, Sacred Lands File search, Native American outreach, a review of historic aerial photographs and maps, and pedestrian survey of the project site. A records search was obtained from the South Coastal Information Center (SCIC) on September 11, 2018, with an update obtained on July 13, 2021. The records search included a one-mile radius around the Camino del Mar Bridge project area and potential staging areas; the 2021 update included a refined quarter-mile radius around the bridge and potential staging areas. The records search revealed that 67 studies have been conducted and 25 cultural resources have been documented within the search radius, none of which has been recorded within the Camino del Mar Bridge project footprint or potential staging areas.

The Area of Potential Effect (APE), shown in Figure 18, *Cultural Resources Area of Potential Effects*, was established as all areas in which the project has the potential to impact cultural resources directly or indirectly, and includes the extent of the project footprint, consisting of both permanent and temporary construction activities associated with the project, and potential staging areas for a total of 23.1 acres. A pedestrian archaeological field survey of the archaeological survey area was conducted by HELIX staff archaeologist James Turner and Kumeyaay Native American monitor Anthony LaChappa from Red Tail Environmental on July 21, 2021.

Areas under the jurisdiction of the State Lands Commission fall within the project APE. Pursuant to Public Resources Code Section 6313, the title to all cultural resources on or within the tide and submerged lands of California is vested in the State and under jurisdiction of the State Lands Commission.

a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

No Impact. Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Significant cultural resources are defined as "historical resources," and include those resource(s) that are listed or

determined eligible by the State Historical Resources Commission for listing in the California Register of Historical Resources (CRHR) (14 CCR Section 15064.5[a][1]); listed in the National Register of Historic Places (NRHP) or in a "local register of historical resources" or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the PRC, unless "the preponderance of evidence demonstrates that it is not historically or culturally significant" (14 CCR Section 15064.5[a][2]); or determined by the Lead Agency to meet the criteria for listing on the CRHR (14 CCR Section 15064.5[a][3]). For listing in the CRHR, a historical resource must be significant at the local, state, or national level under one or more of the following four criteria: (1) it is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; (2) it is associated with the lives of persons important to local, California, or national history; (3) it embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; and/or (4) it has yielded or has the potential to yield information important to the prehistory or history of the local area, California, or the nation. All resources that are eligible for listing in the NRHP or CRHR must have integrity, which is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Resources, therefore, must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. A resource must also be judged with reference to the criteria under which it is proposed for nomination.

The project APE does not include built environment or archaeological cultural resources except for the bridge itself, Camino del Mar Bridge (Bridge No. 57C-0209), which is listed in the Caltrans historic bridge inventory as Category 5, *Not Eligible for Listing in the National Register*. No known historical resources per CEQA would be affected by the project, and no impact would occur.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Less Than Significant with Mitigation Incorporated. As discussed above, the project's Archeological Survey Report included a records search encompassing a one-mile radius around the project area and potential staging areas. Archaeological resources recorded within one mile of the project area consist of four prehistoric artifact scatters, two shell scatters, a prehistoric habitation site with an associated artifact scatter, and two isolates. Historic resources recorded within a mile of the project APE consist of seven historic structures, four historic sites consisting of building or construction remains, two historic bridges, a transmission line, and two historic isolates.

The Native American Heritage Commission (NAHC) was contacted on August 21, 2018, for a Sacred Lands File search and list of Native American contacts for the project area. The NAHC indicated in a response dated August 23, 2018, that no known sacred lands or Native American cultural resources have been identified within the project area. Outreach letters were sent by HELIX staff to tribal representatives specified by the NAHC on July 22, 2021. The Jamul Indian Village responded that there is a culturally sensitive area in close proximity to the project and would like to receive new information and field survey results for the project. The San Pasqual Band of Mission Indians responded that the project lies within the boundaries of the territory that the tribe considers its Traditional Use Area and indicated that they would like to engage in formal government-to-government consultation. The Viejas Band of Kumeyaay Indians (Viejas) responded on August 3, 2021, and indicated that they reviewed the proposed project area and determined that the project site has cultural significance or ties to Viejas and



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0 600 Feet

Source: Aerial (SanGIS, 2017)

HELIX Environmental Planning

Cultural Resources Area of Potential Effects

Figure 18

that cultural resources have been located within or adjacent to the project APE. Viejas requested that a Kumeyaay Cultural Monitor be on site for ground disturbing activities and to inform them of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains. Two other tribes, Agua Caliente Band of Cahuilla Indians and Rincon Band of Luiseño Indians, deferred to other tribes in the area. Native American consultation conducted pursuant to Public Resources Code Section 21080.3.1 is discussed in Section XVIII, *Tribal Cultural Resources*.

While no significant cultural resources have been identified within the APE, there are numerous and important cultural resources that have been identified in the project vicinity and there is potential for buried cultural resources to be present within the project footprint. If project construction activities were to encounter an unrecorded archaeological resource, potential impacts could be significant, and mitigation would be required. Mitigation measure CUL-1 would be implemented to avoid or minimize potential impacts on archaeological resources and would reduce impacts to less than significant.

CUL-1 A qualified archaeologist meeting the United States Secretary of the Interior's Professional Qualifications for prehistoric and historic archaeology and a Kumeyaay Native American monitor shall be retained to conduct a cultural resources monitoring program. The monitoring program shall include attendance by the archaeologist and Native American monitor at a pre-construction meeting with the construction contractor and the presence of an archaeological and Native American monitor during initial ground disturbance for the project. If it is determined by the archaeologist and Native American monitor that past grading and other disturbances have removed soils with a reasonable potential for containing cultural material, monitoring can be reduced and recommence when the ground-disturbing activities continue in native soil. If cultural material is encountered, the archaeologist and the Native American monitor shall have the authority to temporarily halt or redirect ground-disturbing activities while the cultural material is documented and assessed. If a cultural resource is determined to be significant, the archaeologist and Native American monitor shall coordinate with the City staff to develop and implement appropriate treatment measures. Artifacts collected (if any) shall be cataloged, analyzed, and curated with accompanying catalog to current professional repository standards and transferred to an appropriate curating facility within San Diego County. Alternatively, artifacts may be returned to the consulting tribe for reburial or for curation at a tribal facility. A report shall be completed by the qualified archaeologist describing the methods and results of the monitoring program. <u>The final disposition of archaeological, historical, and paleontological resources recovered on State land under the jurisdiction of the California State Lands Commission must be approved by the California State Lands Commission.</u>

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

Less Than Significant Impact. There are no known grave sites within the project limits. While it is unlikely due to the previous disturbance that has occurred within the project site, there is the potential for unknown human remains to be discovered during construction. If this occurs, project construction activities would be required to comply with California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. Specifically, if human remains are discovered, the San Diego County Coroner shall be immediately contacted for a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. If the remains are determined to be of Native American origin, the Coroner would notify the NAHC, which would determine and notify a Most Likely Descendant (MLD). With the permission of the City and/or its authorized representative, the MLD may inspect the site of the discovery, and shall complete the inspection within 24 hours of notification by the NAHC. The MLD

would have the opportunity to make recommendations to the NAHC on the treatment and disposition of the remains. With the required adherence to the California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98, impacts would be less than significant.

VI. Energy

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	■	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	■	☐

The following discussion utilizes the energy usage data presented in the Air Quality and Greenhouse Gas Emissions Assessment Letter prepared by HELIX (2021; Appendix A) to evaluate potential impacts associated with energy consumption and efficiency.

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less Than Significant Impact. Project construction activities would temporarily consume energy through the use of construction equipment and vehicles over an approximately ~~27~~36-month period. Energy used for construction would primarily consist of fuels in the form of diesel and gasoline for the operation of construction equipment and construction worker vehicles. While construction activities would consume petroleum-based fuels, consumption of such resources would be temporary and would cease upon the completion of construction. The petroleum consumed during project construction would be typical of similar construction projects and would not require the use of new petroleum resources beyond what are typically consumed in California. No methods of construction that would result in inefficient or unnecessary use of energy resources are proposed.

Once construction has been completed, no increase in energy resources beyond existing energy use is anticipated. While energy resources would be consumed during periodic maintenance of the bridge facilities, maintenance activities are expected to be similar or less intensive than existing conditions and would not result in the additional use of energy resources. Based on these considerations, construction of the project would not result in wasteful, inefficient, or unnecessary consumption of energy resources, and impacts would be less than significant.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less Than Significant Impact. The project is subject to a number of state plans for renewable energy and energy efficiency, including CARB's 2017 Climate Change Scoping Plan, the 2019 California Energy Efficiency Action Plan, and the California Renewables Portfolio Standard Program. These state plans do

not include regulations that would apply to a bridge replacement project; therefore, the project would not conflict with or obstruct a state plan for renewable energy or energy efficiency.

Local plans addressing energy reduction and efficiency include the City's Municipal Code Chapter 23.70, which requires solid waste diversion for construction and demolition debris (City 2021a). On August 5, 2019, the City adopted the Construction and Demolition Waste Recycling Ordinance, which created a local process to demonstrate compliance with California Green Building Standards requirements. Projects are currently required to divert 65 percent of waste generated during construction from landfills. Construction activities associated with the project would be required to comply with applicable regulations, including mandatory requirements for construction and demolition debris in the City's Municipal Code that address energy efficiency. Accordingly, the project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency, and impacts would be less than significant.

VII. Geology and Soils

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a)	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
	i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	■	☐
	ii. Strong seismic ground shaking?	☐	☐	■	☐
	iii. Seismic-related ground failure, including liquefaction?	☐	☐	■	☐
	iv. Landslides?	☐	☐	■	☐
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☐	■	☐
c)	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	■	☐
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	■	☐
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	■

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	■	☐	☐

The following discussion is based on the Preliminary Geotechnical Design Report (Geotechnical Report) and Preliminary Foundation Report (Foundation Report) prepared by Kleinfelder (Kleinfelder 2020a and 2020b), attached to this IS/MND as Appendices D and E, respectively. The geotechnical investigations summarized in the Geotechnical Report and Foundation Report included review of available geotechnical information, exploratory borings and testing within proximity to existing bridge abutments, and laboratory testing of soil samples. The project site is generally underlain by an upper layer of Recent Alluvial Deposits (Qa) overlying successive strata of Young Alluvial Deposits (Qya), Young Estuarine Deposits (Qyes), Old Alluvial Deposits (Qoa), and the Del Mar Formation (Td).

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

    i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?

Less Than Significant Impact. The City, like the rest of southern California, is located within a seismically active region as a result of being located near the active margin between the North American and Pacific tectonic plates. The major faults east of the site (from east to west) include the San Andreas, San Jacinto, and Elsinore faults. Major faults west of the site are all offshore and include the Rose Canyon-Newport-Inglewood, Palos Verdes-Coronado Bank, San Diego Trough, and San Clemente faults. The most dominant zone of active faulting within the San Diego region is the Rose Canyon Fault Zone (RCFZ). The RCFZ is composed of predominantly right-lateral strike-slip faults that extend north to northwest through the San Diego metropolitan area towards La Jolla; however, various fault strands display normal, oblique, or reverse components of displacement as well. The fault zone extends offshore at La Jolla and continues north-northwest subparallel to the coastline. To the south in the San Diego downtown area the fault zone appears to splay out into a group of generally right-normal oblique faults extending into San Diego Bay (Treiman 1993). The closest fault to the site is the off-shore portion of the Rose Canyon-Newport-Inglewood connected fault located approximately 2.2 miles west of the site.

According to the California Geologic Survey, there are no Alquist-Priolo Earthquake Fault Zones in the City and nearest zone is in the La Jolla Quadrangle approximately eight miles south of the project site. Due to the absence of active faults at or near the project site, the potential for ground rupture is very low and impacts are considered to be less than significant.

    ii. Strong seismic ground shaking?

Less Than Significant Impact. As described in VII.a.i, the project site is in a seismically active region. The most significant seismic event likely to affect the project site would be an earthquake resulting from rupture along the offshore Rose Canyon fault, which is located approximately 2.2 miles west of the site.

Ground-shaking could affect the integrity of the project's components; however, recommendations in the project Geotechnical Report would be implemented during final design and construction to provide suitable subsurface conditions to support the new bridge. Specifically, the Geotechnical Report recommends that a minimum of 12 inches of existing subgrade soils should be over excavated and replaced with new, compacted engineered fill. The new, compacted engineered fill would be placed per ASTM International soil compaction standards, as described in further detail in the Geotechnical Report. Potential impacts related to strong seismic ground shaking would be less than significant.

iii. Seismic-related ground failure, including liquefaction?

Less Than Significant Impact. Liquefaction is the phenomenon where saturated granular soils develop high-pore water pressures during seismic shaking and behave like a heavy fluid. This phenomenon generally occurs in areas of high seismicity where groundwater is shallow and loose granular soils or hydraulic fill soils subject to liquefaction are present. The factors known to influence liquefaction potential include soil type, relative density, grain size, confinement, depth to groundwater, and the intensity and duration of the seismic ground shaking. For liquefaction to occur, loose granular sediments below the groundwater table must be present and shaking of sufficient magnitude and duration must occur.

Based on the results of the subsurface investigation for the project documented in the Geotechnical Report, previous subsurface investigations by others, and preliminary engineering analyses, the potential for liquefaction within the project area is considered high. Young or very recent sediments such as the young alluvial floodplain deposits underlaying the site are highly susceptible to liquefaction during a seismic event on a nearby fault. The old alluvial deposits at the project site are considered to have a low liquification susceptibility, since they are stronger and gain liquefaction resistance through aging. Based on the proposed construction methods, seismic loading, and site conditions, the calculated post-liquefaction vertical volumetric settlements within the upper 50 feet of the soil profile generally ranged from 3 to 7 inches. A site response analysis was performed to develop a site-specific design acceleration response spectrum to be used for the seismic design of the proposed replacement bridge and other ancillary structures at the site (refer to Appendix F of the Geotechnical Report; Kleinfelder 2020a, Appendix D to this IS/MND). Incorporation of the recommended seismic design considerations into the replacement bridge design would reduce potentially significant liquefaction impacts to less than significant.

Another type of seismically induced ground failure that can occur as a result of seismic shaking is dynamic compaction, or seismic settlement. This phenomenon typically occurs in unsaturated, loose to medium dense granular material or poorly compacted fill soils. The granular fill soils encountered above the groundwater table at the site were generally found to be in a medium dense condition. Seismic settlement potential of the existing artificial fill soils using the method of Tokimatsu and Seed (Tokimatsu 1987) was evaluated in the PGDR (see Appendix D). Based on the results of the borings and CPTs and the seismic loading, seismic compression settlement was calculated to be less than approximately 1/3-inch. In order to address potential impacts associated with seismic-related ground failure attributed to liquefaction and seismic settlement, the recommendations in the project Geotechnical Report and Foundation Report would be implemented during final design and construction of the bridge. Therefore, impacts associated with seismic-related ground failure would be less than significant.

iv. Landslides?

Less Than Significant Impact. Landslide activity generally occurs in areas where slopes are steep (typically 30 percent or more) and lack vegetation. Several formations within the San Diego region are particularly prone to landslides. These formations generally have high clay content and mobilize when they become saturated. Other factors, such as steeply dipping bedding that project out of the face of the slope and/or the presence of fracture planes, will also increase the potential for a landslide.

The nearest steep slope to the site is located approximately 400 feet to the northwest. This slope is part of the coastal bluff and is comprised of the Del Mar Formation. The Del Mar Formation is known for instability in steep slopes. However, due to the distance to the project site from these slopes and the relatively flat-lying site topography outside of the bridge footprint, the hazard with respect to a landslide impact at the site is low and impacts associated with landslides would be less than significant.

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact. During construction there is potential for temporary erosion impacts associated with grading activities. Potential short-term erosion and sedimentation impacts would be addressed through compliance with applicable regulations as specified by the RWQCB, including compliance with the National Pollutant Discharge Elimination System (NPDES) and the adoption and implementation of a Stormwater Quality Management Plan (SWQMP). The SWQMP would incorporate BMPs in accordance with the California Stormwater Best Management Practices Handbook to control erosion and protect the quality of surface water runoff during project construction. Due to the proximity to nearby wetlands and the lagoon, the use of sediment controls to prevent off-site sediment transport would be employed, which may include silt fencing, fiber rolls, and gravel bags; remedial measures to prevent erosion would be required. Based upon compliance with the NPDES permit and implementation of a SWQMP, construction impacts related to soil erosion would be less than significant.

The project would not result in long-term, operational impacts associated with soil erosion or loss of topsoil, but may be subject to long-term scour effects. Scour is the loss of ground by erosion in flowing water environments caused by changes in flow volume, velocity, or direction. Scour can occur over the width of the stream or riverbed and can be concentrated at locations in which hard protrusions occur in a riverbed, such as at bridge piers. The San Dieguito River channel may scour during high flow events along the existing embankment slopes to the north of the bridge outside of the proposed bridge footprint. The existing riprap slope protection would be maintained and augmented to protect these slopes from surficial erosion from high flow events, and impacts would be less than significant.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Less Than Significant Impact. Refer to VII(a) regarding landslides, liquefaction, and collapse, which assessed a less than significant impact with implementation of design recommendations presented in the project Geotechnical Report and Foundation Report. An additional related hazard, lateral spreading, involves horizontal displacement on sloped surfaces as a result of underlying liquefaction, with this phenomenon potentially occurring on shallow slopes. Based on the described presence and thickness of potentially liquefiable soils within the study area, the potential for seismically induced lateral spreading is considered low. Potentially significant impacts related to an on-site or off-site landslide, lateral

spreading, subsidence, liquefaction, or collapse are not anticipated as a result of the project. As such, impacts would be less than significant.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Less Than Significant Impact. Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or pavements supported on grade. Visual classification of the soils near anticipated subgrade elevations indicates that these soils primarily consist of non-plastic poorly graded sand with small amounts of silt. Based on the results of field investigations and review of existing information presented in the Geotechnical Report, soils near the ground surface generally have a very low to low expansion potential. Isolated zones of more expansive soil may also be encountered near the surface but are not anticipated. The project would implement applicable recommendations for soil preparation presented in the project Geotechnical Report. Implementation of these recommendations would ensure that project impacts associated with expansive soils would be less than significant.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact. No septic tanks or alternative wastewater disposal systems are proposed; therefore, no impacts would occur.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant with Mitigation Incorporated. The project is underlain by old paralic deposits and marine beach deposits, dating to the late to mid Pleistocene and late Holocene (Kennedy and Tan 2008). The Bay Point formation, of Pleistocene age, is also present in the adjacent bluffs adjacent to the project area (Kennedy 1975). This formation is mostly marine sedimentary in origin and variously consists of siltstone, sandstone, shale, and conglomerate (Kennedy 1975). Old Paralic deposits and marine beach deposits have the potential to contain fossils and are assigned high and moderate sensitivity ratings, respectively, by the County's paleontological guidelines. Ground-disturbing activities extending deep enough to encounter these geologic units have the potential to affect scientifically significant paleontological resources.

Based on the noted geologic and topographic information, there is a potential that unique paleontological resources may be discovered during ground disturbing activities, including pile installation. Implementation of mitigation measures GEO-1 and GEO-2 would reduce potentially significant impacts to paleontological resources to less than significant.

Mitigation Measures

GEO-1 Paleontological Resources Monitoring and Treatment Plan. Prior to the start of any ground-disturbing activity, a Paleontological Resources Monitoring and Treatment Plan (PRMTP) shall be prepared by a qualified paleontologist, subject to review and approval by the City of Del Mar. The PRMTP shall address construction monitoring procedures and provide treatment measures for paleontological resources discoveries, including the development of protocols for handling

fossils discovered during construction, likely including temporary diversion of construction equipment so that the fossils could be recovered, identified, and prepared for dating, interpreting, and preserving at an established, permanent, accredited research facility.

GEO-2 Paleontological Monitoring Program. Prior to the start of any ground-disturbing activity, a qualified paleontologist shall attend the pre-construction meeting to consult with the grading and excavation contractors concerning excavation schedules, paleontological field techniques, and safety issues. A paleontological monitor shall be on site on a full-time basis during the original cutting of previously undisturbed deposits of high paleontological resource potential (Bay Point Formation and Delmar Formation) to inspect exposures for contained fossils. Grading activities in previously undisturbed deposits of moderate paleontological resource potential (Torrey Sandstone) shall be monitored on a part-time basis.

In the event that paleontological resources are discovered or unearthed during project subsurface activities, all earthmoving activities within radius of not less than 50 feet from the discovery shall be temporarily suspended or redirected until a certified paleontologist has recovered, identified, and/or evaluated the nature and significance of the find, in compliance with CEQA Guidelines 15064.5(f). After the find has been appropriately mitigated, work in the area may resume.

Any fossil remains collected during monitoring and salvage shall be cleaned, repaired, sorted, and cataloged as part of the monitoring program. Prepared fossils, along with copies of all pertinent field notes, photos, and maps, shall be deposited in a scientific institution with permanent paleontological collections such as the San Diego Natural History Museum. Donation of the fossils shall be accompanied by financial support for preparation, curation, and initial specimen storage, if this work has not already been completed. A final summary report shall be completed that outlines the results of the paleontological monitoring program. This report shall include discussions of the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils.

VIII. Greenhouse Gas Emissions

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	■	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	■	☐

The following discussion is based on the Air Quality and Greenhouse Gas Emissions Assessment Letter prepared by HELIX (2021; Appendix A). As noted in the introduction to Section 2.III, *Air Quality*, following circulation of the Draft IS/MND for public review, it was determined that a 36-month construction duration would be more appropriate for the project than the 27-month construction duration identified

in the Draft IS/MND. The Air Quality and Greenhouse Gas Assessment Letter modeling was based on an estimated 27-month construction duration. The quantity, duration, and the intensity of construction activity influence the amount of construction emissions that occur at any one time. As such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction is occurring in a relatively intensive manner. Because of this conservative assumption, actual emissions could be less than those forecasted. The Air Quality and Greenhouse Gas Assessment Letter has not been revised to reflect the 36-month construction duration, since estimated emissions are well below the CEQA significance thresholds and an extended construction schedule would result in reduced emissions compared to what was previously analyzed.

Discussion

Climate change is a complex phenomenon that has the potential to alter local climatic patterns and meteorology. Increases in anthropogenic GHG emissions have been unequivocally linked to recent warming and climate shifts (Intergovernmental Panel on Climate Change 2007). Although modeling indicates that climate change would result globally and regionally, there remains uncertainty about characterizing the precise local climate characteristics and predicting precisely how various ecological and social systems would react to changes in the existing climate at the local level. Regardless of this uncertainty in precise predictions, it is widely understood that some degree of climate change is expected as a result of past and future GHG emissions. Greenhouse gases, as defined under California's Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6). Emissions of GHGs besides CO_2 are converted to their carbon dioxide equivalent (CO_2e), which is a consistent methodology for comparing GHG emissions achieved by normalizing various GHG emissions to a consistent measure. CO_2 has a global warming potential (GWP) of one. By comparison, the GWP of CH_4 is 25 and the GWP of N_2O is 298.

AB 32 recognizes that California is a source of substantial amounts of GHG emissions, which pose a serious threat to the economic wellbeing, public health, natural resources, and the environment of California. In order to help avert these potential consequences, AB 32 established a state goal of reducing GHG emissions to 1990 levels by the year 2020, which is a reduction of approximately 16 percent from forecasted emission levels, with further reductions to follow. In addition, AB 32 required CARB to develop a Scoping Plan to help the State achieve the targeted GHG emission reductions. In 2015, Executive Order (EO) B-30-15 established a California GHG emission reduction target of 40 percent below 1990 levels by 2030. As a follow-up to AB 32 and in response to EO-B-30-15, Senate Bill (SB) 32 was passed by the California legislature in 2016 to codify the EO's California GHG emission reduction target of 40 percent below 1990 levels by 2030.

The City adopted a Climate Action Plan (CAP) in June 2016, which sets targets for reducing GHG emissions by 2020 and 2035; identifies strategies to meet the targets; and formulates a plan for implementation. The CAP aims to reduce GHG emissions from baseline year (2015) levels 15 percent by 2020, and 50 percent by 2035. The CAP also includes a renewable energy goal of 50 percent by 2020 and 100 percent by 2035 for total energy consumption within the City. Additional CAP strategies include reducing water consumption and waste generation, promoting energy efficiency, and encouraging sustainable transportation alternatives (City 2016).

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant Impact. Construction of the project would result in GHG emissions generated by vehicle engine exhaust from construction equipment, haul trucks, and worker commuting trips. The City's CAP has established that GHG emissions impacts for projects which are consistent with the CAP would be less than significant; however, the GHG reduction strategies and actions contained in the CAP are not applicable to construction activities, nor are construction emissions included in the City GHG emissions inventory. An appropriate bright line threshold would be a more conservative approach to determining the significance of the project's GHG emissions. For the purpose of this report and as described in further detail in the Air Quality and Greenhouse Gas Assessment Letter, 540 metric tons (MT) of CO_2e is utilized as the screening level threshold for the project. The screening level threshold is intended to evaluate a project's long-term annual contribution to GHG emission inventories. To determine the project's contribution to future annual City GHG emissions inventories, the construction emissions are amortized (e.g., averaged) over the anticipated lifespan of the project.

Construction GHG emissions were calculated in the Air Quality/Greenhouse Gas Assessment Letter using CalEEMod, Version 2020.4.0 using the modeling assumptions presented the Methodology and Assumptions section, including Table 2, Construction Stage Activities, and Table 3, Off-road Equipment, and Table 4, Construction Trips, from the Letter (HELIX 2021; Appendix A). The estimated construction GHG emissions for the project are shown below in Table 7, *Construction Greenhouse Gas Emissions*.

Table 8
CONSTRUCTION GREENHOUSE GAS EMISSIONS

Stage/Year	MT CO_2e per year
Stage 1 2024	122.3
Stage 2 2024	432.7
Stage 2 2025	310.6
Stage 3 2025	545.4
Stage 3 2026	166.4
Stage 4 2026	87.8
Stage 5 2026	78.9
Total Construction Emissions[1]	1744.1
Amortized Emissions (30 years)	**58.1**
2030 Screening Threshold	540
Exceed Threshold?	**No**

Source: HELIX 2021, CalEEMod output data provided in Attachment A to Appendix A.
[1] Total may not sum due to rounding.
MT = metric tons; CO_2e = carbon dioxide equivalent; GHG= greenhouse gases

As shown in Table 8, construction of the project has been conservatively estimated to result in approximately 58 MT CO_2e annually, amortized over an estimated 30-year lifespan of the bridge.[2] Once operational, the new bridge would not result in changes to emissions from traffic on public roadways or from bridge maintenance activities, compared to existing conditions. Emissions resulting from implementation of the Program would not exceed the screening threshold of 540 MT CO_2e. Therefore,

[2] Although prestressed concrete bridges may last 100 or more years, for the purposes of evaluating GHG emissions, the lifespan of the bridge is the shortest anticipated period before major repair or retrofit would be required.

the implementation of the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less Than Significant Impact. The project would replace an existing bridge on a public roadway for public health and safety. The project would not generate growth in population or employment or require the alteration of an existing land use designation through amendment(s) to the City's Community/General Plan or changes to zoning. Long-term operation of the bridge would not result in changes to GHG emissions from traffic or maintenance activities, compared to the existing condition. Furthermore, as shown in Table 8, project construction would not result in a significant increase in GHG emissions. Therefore, the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, including the City's CAP. The impact would be less than significant.

IX. Hazards and Hazardous Materials

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	■	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	■	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	■
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	■
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	■
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	■	☐

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	■	☐

The following discussion is based on the Initial Site Assessment prepared by Kleinfelder (Kleinfelder 2021b), attached to this Initial Study as Appendix F.

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant with Mitigation Incorporated. During the ~~27~~36-month construction period, there is the possibility of accidental release of hazardous substances such as spilling of hydraulic fluid or diesel fuel associated with construction equipment maintenance. According to the ISA, there is potential for polychlorinated biphenyl (PCB)-containing oils to be present in pole-mounted transformers. Mitigation measure HAZ-1 would be implemented to address potential impacts associated with disposal of on-site transformers.

The level of risk associated with the accidental release of other hazardous substances is not considered significant, due to the small volume and low concentration of these hazardous materials anticipated to be present on site. The construction contractor would be required to use standard construction controls and safety procedures to avoid or minimize the potential for accidental release of such substances into the environment.

Mitigation Measures

HAZ-1 Should removal of pole-mounted transformers be required as part of the project, the local utility company shall be notified for proper testing and removal. If such removal is required, a survey shall be conducted prior to demolition to determine the presence or absence of PCBs in applicable power pole transformers. These surveys shall be conducted by qualified/certified personnel, such as federal- and/or state-certified inspectors/assessors. Evidence of survey completion shall consist of a signed and stamped statement submitted to the City from the person certified to complete the facility survey, indicating that the survey has been completed and that either regulated PCBs are present or absent. If regulated PCBs are present, all related handling and disposal shall be conducted pursuant to applicable federal (e.g., 40 CFR Part 761) and state (e.g., Title 22). Verification that the specified procedures were followed shall be provided to the City.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less Than Significant with Mitigation Incorporated. As discussed above, the proposed project would not result in the introduction of new hazardous materials at the project site as project construction would involve typical construction equipment. Operations would entail the same usage as currently. Elevated concentrations of lead (from use of leaded gasoline) and other metals are sometimes

associated with older roadways. Based on a review of historical documentation for the site and surrounding area, aerially deposited lead (ADL) has the potential to be encountered during construction activities. Potential impacts associated with upset and/or accident conditions involving the release of ADL into the environment would be minimized through compliance with the July 1, 2016 Aerially Deposited Lead Agreement between Caltrans and the California Department of Toxic Substances Control. The Aerially Deposited Lead Agreement allows ADL-contaminated soils to be safely reused within the project limits assuming that all requirements of the Aerially Deposited Lead Agreement are met.

Additionally, due to the age of the bridge, the potential exists for asbestos containing materials (ACMs) and lead based paint (LBP) to be present. Demolition activities could result in the disturbance of ACMs and LPB. In accordance with SDAPCD Rule 1206, Asbestos Removal, Renovation, and Demolition, prior to commencement of renovation or demolition operations and prior to submitting the notifications required by Section I of Rule 1206, a facility survey should be performed to determine the presence or absence of ACM, regardless of the age of the facility (SDAPCD 2017). The ACM survey should be performed in conformance with the U.S. Environmental Protection Agency (USEPA) National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 Code of Federal Regulation (CFR) Part 61, Subpart M, and SDCAPCD Rule 1206. An LBP survey shall be performed in accordance with California Department of Public Health (CDPH) guidelines (Kleinfelder 2021). In addition, airborne asbestos is regulated in accordance with the NESHAP. These regulations specify precautions and safe work practices that must be followed to minimize the potential for release of asbestos fibers. Completion of ACM and LPB surveys, and adherence to SDAPCD and OSHA regulations for the identification, removal, and transport of ACMs and LBP would ensure the project's construction activity would not expose sensitive receptors to substantial pollutant concentrations of airborne asbestos and LBP (see mitigation measures HAZ-2 and HAZ-3).

The potential exists for treated wood waste to be present associated with guard rail posts or pedestrian walkway decking within the project area. Sampling of the sign, guard rail posts, or decking for the presence of wood-preserving chemicals would be conducted prior to demolition and treated wood waste would be handled consistent with Caltrans' Standard Special Provisions 14-11.14 (Kleinfelder 2021). Completion of sampling and adherence to Caltrans' Standard Special Provisions would ensure that construction activities would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of these hazardous materials into the environment. Implementation of mitigation measures HAZ-2 and HAZ-3 would reduce impacts to less than significant.

Mitigation Measures

HAZ-2 An ACM survey shall be conducted by a qualified individual in conformance with NESHAP 40 Code of Federal Regulation (CFR) Part 61, Subpart M, and San Diego County Air Pollution Control District (SDCAPCD) Rule 1206, prior to the start of construction. Evidence of survey completion shall consist of a signed and stamped statement submitted to the City from the person certified to complete the facility survey, indicating that the survey has been completed and that either regulated asbestos is present or absent. If regulated ACMs are present, the statement shall describe the procedures that will be taken to remediate the hazard, including applicable regulations for demolition methods and dust suppression SDAPCD Rule 1206, and proper handling and disposal under CCR Title 22, Division 4.5. Verification that the specified procedures were followed shall be provided to the City.

HAZ-3 An LBP survey shall be conducted by a qualified individual in accordance with CDPH guidelines, prior to the start of construction. Evidence of survey completion shall consist of a signed and stamped statement submitted to the City from the person certified to complete the facility survey, indicating that the survey has been completed and that either regulated LBP is present or absent. Lead containing materials shall be managed in accordance with applicable regulations including, at a minimum, the hazardous waste disposal requirements (CCR Title 22, Division 4.5); and the State Lead Accreditation, Certification and Work Practice Requirements (CCR Title 17, Division 1, Chapter 8). Verification that the specified procedures were followed shall be provided to the City.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact. There are no schools within one-quarter mile of the proposed project, and the closest school is St. James Academy, located approximately 0.4-mile northeast of the northernmost extent of the project boundary. Impacts related to the handling of acutely hazardous materials are not anticipated, and no impact would occur.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact. Pursuant to Government Code Section 65962.5 (Cortese List) requirements, the State Water Resource Control Board (SWRCB) GeoTracker database (SWRCB 2021) and the California Department of Toxic Substances Control (DTSC) EnviroStor database (DTSC 2021) were searched for hazardous materials sites within ¼ mile of the project area. Based on a review of these databases, there were no open sites identified within the project area and a ¼ mile buffer. As a result, the project site is not a listed hazardous materials site and would not create a significant hazard to the public or environment. No impact would occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

No Impact. The project site is not located within an airport influence area or within two miles of a public or public use airport and is not subject to the requirements of any airport land use compatibility plan, which means there are no locations with the City of Del Mar that have been identified as subject to aircraft-related safety or noise hazards. The closest public airport is McClellan-Palomar Airport, which is located approximately 13 miles northeast of the project site. The closest military use airport is Marine Corps Air Station (MCAS) Miramar, which is located approximately 7 miles south of the City. Accordingly, the mapped noise and safety hazard locations associated with these respective airports are not located within the City of Del Mar. Therefore, the proposed project would not result in a noise or safety hazard for people residing or working in the project area. No impact would occur.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. Emergency response and evacuation is the responsibility of the law enforcement and fire service providers detailed in Section XV, *Public Services*. The proposed project

would not impair or physically interfere with emergency response or evacuation. During the ~~27~~ 36-month construction period, up to ~~12~~ 14 temporary nighttime full bridge closures would occur. Traffic would be detoured around the bridge along Via de la Valle and Jimmy Durante Boulevard to allow continuous vehicle access within the project area. Potential impacts would be avoided or minimized through implementation of a TCP, as well as advanced noticing and coordination with emergency response services. Impacts related to impairment of an emergency response or evacuation plan would be less than significant.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Less Than Significant Impact. The proposed bridge replacement project is located in the northern part of the City, perpendicular to the San Dieguito River. Areas to the south and east of the project site are identified as within a "Very High Fire Hazard Severity Zone" as designed by the California Department of Forestry and Fire Protection (CAL FIRE). The proposed project would not involve the placement of new structures, nor would it be inconsistent with the City of Del Mar Urban Forest Management and Fire Safety Strategic Plan (City 1999). As such, the proposed bridge replacement would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. Impacts would be less than significant.

X. Hydrology and Water Quality

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a)	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	■	☐
b)	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	■	☐
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
	i. Result in substantial erosion or siltation on- or off-site?	☐	☐	■	☐
	ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off- site?	☐	☐	■	☐
	iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional resources of polluted runoff?	☐	☐	■	☐

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	iv. Impede or redirect flood flows?	☐	☐	■	☐
d)	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	■	☐
e)	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	■	☐

The following discussion is based on the Hydraulics and Sediment Transport Report prepared by Chang Consultants (Chang 2020) and Preliminary Drainage Study prepared by San Dieguito Engineers (2022), included as Appendices G and H to this IS/MND, respectively. A Draft SWPMP has been prepared pursuant to the County of San Diego Green Streets Priority Development Project Exempt SWQMP form, to be implemented as a condition of project approval.

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Less Than Significant Impact. The project site is located at the downstream end of the 345-square-mile San Dieguito Watershed, within the Solana Beach Hydrologic Area (905.1). The project area accounts for approximately 0.156 percent of the local San Dieguito watershed area. The project site is located within the RWQCB San Diego Region Basin Plan (Basin Plan). Under Section 402 of the CWA, the RWQCB issues NPDES permits to regulate discharges to "waters of the nation," which include rivers, lakes, and their tributary waters. Waste discharges include discharges of stormwater and construction-related discharges. Potential impacts related to water quality could occur during construction, when the potential for erosion, siltation, sedimentation, and accidental release of hazardous materials would be the greatest. The project would implement standard temporary water pollution control, permanent design pollution prevention, and post-construction treatment BMPs to avoid substantial degradation to surface and groundwater quality. Implementation of a SWQMP would be required under the NPDES Construction General Permit (NPDES No. CAS000002, Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100), administered by the RWQCB. The SWQMP would include specific BMPs to avoid or reduce potential impacts related to the use and potential discharge of construction-related hazardous materials, including, but not limited to, the following:

- No demolition or construction materials, equipment, debris, or waste would be placed or stored where it may enter receiving waters or a storm drain or be subject to river, wind, rain, or tidal erosion and dispersion.

- All stockpiles and construction materials would be covered and enclosed on all sides, be located as far away as possible from drain inlets and waterways, and may not be stored in contact with soil.

- Machinery and equipment would be maintained and washed in confined areas specifically designed to control runoff. If thinners, petroleum products or solvents must be used on site, they would be properly recycled or disposed after use and may not be discharged into storm drains, sewers, receiving waters, or onto the unpaved ground.

- Spill prevention and control measures would be implemented to ensure the proper handling and storage of petroleum products and other construction materials. Measures would include a designated fueling and vehicle maintenance area with appropriate berms and protection to prevent spillage of gasoline or related petroleum products or contact with runoff. The designated area would be equipped with spill control materials and located to minimize the risk of spills reaching receiving waters, storm drains, sewers, or unpaved ground.

- Reasonable and prudent measures would be taken to prevent discharge of fuel or oily waste from heavy machinery or construction equipment into coastal waters. Adequate equipment would be available to contain such spills immediately.

The construction contractor would be required to comply with the NPDES and SWQMP requirements regarding the implementation of BMPs during construction. BMPs designed to prevent spillage and runoff of demolition or construction-related materials, and to contain sediment or contaminants associated with demolition or construction activity, would be implemented prior to the on-set of such activity and all BMPs would be maintained in a functional condition throughout the duration of construction activity. Compliance with these requirements would result in less than significant project impacts relative to compliance with applicable water quality standards and waste discharge requirements.

Groundwater was encountered at depths ranging from 11 to 17 feet below ground surface during site investigations conducted for the Geotechnical Report (Kleinfelder 2020a). Due to the proximity of the site to the coast, groundwater levels are expected to fluctuate due to tidal and seasonal influences. Dewatering and/or shoring designed to resist hydrostatic pressures would be necessary to work 15 to 20 feet below the water surface level of the San Dieguito River for the removal/installation of bridge footings. With implementation of the applicable BMPs in compliance with NPDES requirements, construction of the project would not degrade groundwater quality. Therefore, impacts would be less than significant.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Less Than Significant Impact. Implementation of the project would not require the use of groundwater. The new bridge would only incrementally increase the surface area compared to the existing bridge, and drainage infrastructure would be provided within the bridge and approach roadway such that project would not result in a reduced capacity for groundwater recharge or generate significant runoff. Deck drains are required along the bridge to remove water from the surface of the bridge during rainstorm events. Drains would be placed along the edge of the walkway adjacent to the pedestrian railing.

As noted in I.a, excavations extending below the groundwater table would require dewatering and or shoring designed to resist hydrostatic pressures; however, the project would not result in the substantial depletion of groundwater supplies or substantially interfere with groundwater recharge as part of these construction activities. Impacts would be less than significant.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i. Result in substantial erosion or siltation on- or off-site?

Less Than Significant Impact. During construction of the project, there is potential for increased erosion or siltation resulting from construction activities. Implementation of erosion and sediment control BMPs prescribed in the SWQMP would minimize on- and off-site erosion, including from stormwater and non-stormwater discharges. BMPs may include, but not be limited to, temporary soil stabilization and sediment control (e.g., silt fencing, gravel bags, hay bales, fiber rolls, etc.) and non-stormwater management (refer to I.a, above). Conformance with required BMPs would reduce potential impacts related to erosion and siltation during construction to less than significant.

The Hydraulics and Sediment Transport Report evaluates stream hydraulics, sediment transport, and channel changes that may be attributed to the project (Chang 2020). The report concluded that with implementation of the recommended hydraulic bridge design measures, the abutment scour would not be altered by the project and the current abutment protection would be maintained. The abutments may be augmented with additional riprap to reduce hydraulic effects, in accordance with the recommendations of the technical report. Accordingly, the project has incorporated measures into the bridge design to address potential long-term erosion or siltation, particularly relative to changes in the sedimentation pattern in the lagoon and scour effects associated with changes in flow volume, velocity, or direction from project implementation. The proposed abutments would be constructed behind the existing abutments and portions of the existing abutments would be retained in place as additional scour and erosion protection. Riprap slope protection would be placed at the abutment slopes to protect the abutment from surficial erosion and scour, as is the existing condition at the site. Rounded piers are recommended as they are more hydrodynamic, thus causing less scour. Implementation of these design measures would reduce operational erosion and siltation impacts within the river channel to less than significant.

As documented in the Preliminary Drainage Study, runoff from the project site would be over non-erodible surfaces from the roadway and sidewalks or would discharge at points with outlet protection such as riprap energy dissipation that would reduce stormwater flow velocities to non-erosive levels (San Dieguito Engineers, Inc. 2022). Therefore, operational impacts associated with erosion and sedimentation from the bridge would be less than significant.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off- site?

Less Than Significant Impact. The proposed project would involve the replacement of an existing bridge, which would not substantially alter the existing drainage pattern or increase the rate or amount of surface runoff in a manner that would cause on- or off-site flooding. In the existing condition, stormwater within the Camino del Mar roadway drains toward each side of the road and is channeled along the curb. Runoff north of the bridge is collected prior to draining onto the bridge. Flows on the eastern side of the road are collected by inlet and emptied into the San Dieguito Lagoon. Flows from the western side of the road drain overland to the west and are collected by a grated inlet then conveyed west and discharged over riprap into the Pacific Ocean. Runoff from the bridge flows south along the

roadway before collecting within existing inlets in the vicinity of 28th Street and 29th Street. In the existing condition, areas south of the bridge experience flooding conditions during storm events.

While drainage patterns would temporarily be affected during construction due to changes in on-site impervious surfaces as the bridge is being replaced, construction activities occurring within the river channel would be conducted in a manner that would not impede the flow of the existing channel or increase effects associated with flooding.

As proposed, the replacement and widening of the bridge structure and construction of the associated roadway transition would increase the amount of impervious surfaces by approximately 6,700 square feet. The project proposes to remove or replace existing drainage improvements and storm drain infrastructure with new facilities that would be designed to convey 100-year storm event peak flows without causing flooding of the proposed bridge structure. The proposed project would slightly alter the existing drainage pattern due to the high point of the bridge creating a ridge line and reversing runoff toward the north side of the bridge. Drainage flow to the southern end of the bridge would be shortened in length due to the revised bridge profile. Peak stormwater flows were calculated to compare existing and proposed site conditions, as documented in the Preliminary Drainage Study (San Dieguito Engineering, Inc.). An overall increase in peak runoff flow rates of 5.31 cubic feet per second (cfs) was calculated for the project site compared to existing conditions. To reduce peak flow draining south of the bridge and help reduce existing flooding conditions, two new inlets are proposed to collect runoff from the east and west sides of the street immediately south of the southern bridge abutment. These inlets would collect bridge runoff and discharge at the San Dieguito River rather than flowing toward the existing southern downstream inlets along Camino del Mar. Relative to the change in flow rates of runoff into the San Dieguito River, the project was calculated to increase the peak flow by 7.56 cfs; this represents an increase of less than 0.018 percent of the peak flows within the river during a 100-year storm event. Therefore, the increase in runoff would not substantively add to the overall peak flows within the San Dieguito River and would have a negligible effect on the water surface elevations. and impacts would be less than significant.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional resources of polluted runoff?

Less Than Significant Impact. The proposed would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff (refer to X.c.iii, above). During construction, the contractor would comply with NPDES and SWQPM requirements and implement water quality/pollution control BMPs (refer to I.a). As described in I.c(i), they would not substantially alter the existing drainage pattern or increase the rate or amount of surface runoff in a manner that would exceed the capacity of storm drain infrastructure. The bridge design incorporates deck drains to remove water from the surface of the bridge during rainstorm events. A continuous 12-inch-wide curb/pedestal at the base of the pedestrian railing would be provided to support the railing and contain stormwater. Impacts would be less than significant.

iv. Impede or redirect flood flows?

Less Than Significant Impact. The hydraulics of the lagoon, tidal flow from the ocean, and scour patterns around the Camino del Mar Bridge are highly complex. The project is located within Federal Emergency Management Agency (FEMA) mapped 100-year Special Flood Hazard Area Zones AE and X, which means

that the project location generally has an annual one percent chance of flooding on any given year, as well as an annual 0.02 percent chance of flooding every year (FEMA 2020). Since the proposed bridge would encroach into the FEMA floodplain and floodway, the project has been evaluated relative to FEMA's no-rise criteria (Chang 2020). FEMA standards allow encroachments within the floodplain; however, the FEMA standards discourage, and in most cases prohibit, encroachment in the floodway zone portion of the floodplain that would increase the 100-year flood event water surface elevation (WSE). Additionally, Caltrans requires that the bridge has sufficient height to clear the "Design Flood", which is a reference to a FEMA 50-year flood event with two feet of freeboard, and the "Base Flood", which is a reference to a FEMA 100-year flood event with zero freeboard elevation added. One of the primary design considerations for the project is that the proposed bridge must be high enough so that the bottom soffit (low chord) clears the controlling flood elevation, including future sea level rise elevations.

Three main WSE scenarios were considered to inform the bridge design. This includes 1) the 50-year flood event plus two feet of freeboard, 2) the 100-year flood event, and 3) the 100-year flood event plus 38 inches of sea level rise. Based on bridge design analysis, the 50-year flood event plus two feet of freeboard is the controlling elevation, or the highest of the three WSE scenarios (Kleinfelder 2022). It should be noted that the required vertical clearance for a 100-year flood event plus 38 inches of sea level rise scenario does not accommodate transportation access below the bridge (i.e., access for vehicular, pedestrian, or marine vessels), as none is currently provided.

During construction, temporary structures (e.g., trestles, falsework, cofferdams) would be placed within the San Dieguito River channel adjacent to and beneath the existing bridge to enable access to the work areas for constructing the new bridge and dismantling the existing bridge. All work done in the channel would be constructed in a manner that would minimize temporary effects and allow hydraulic activities to continue as close to existing conditions as possible. Restrictive temporary obstructions within the floodplain, such as earthen berms, would not be permitted during construction of the project. Temporary obstructions within the floodplain would be minimized by using flow-through temporary (driven or screwed) piles and temporary trestle bridge to support construction equipment. While placement of the temporary trestle piles may lead to a short-term increase in water elevation upstream during major storm events, openings in the temporary trestle structure would be designed to convey river and tidal waters through the temporary structure. The structure openings would minimize temporary hydraulic impacts and would not negatively impact hydraulic conditions.

Through hydraulic modeling of the San Dieguito River floodplain, it was determined that the proposed project would have no permanent adverse effects to the floodplain or its ability to pass the design-year flood event. The proposed bridge has been designed with a vertical profile that clears the WSE for the 100-year flood event (plus capacity for clearance at 38-inches of sea level rise). The existing abutments would remain, so the overall opening width of the bridge would not change. The existing bridge contains 10 piers whose widths vary from 4 feet along the lower portion to 6 feet near the deck. Therefore, the reduction of piers with the proposed project would provide greater flow conveyance than the existing condition and a no-rise in WSE would be achieved. The project would not cause flood water to reach higher than existing conditions, including a 100-year flood event, and impacts would be less than significant.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Less Than Significant Impact. The proposed project is located within mapped potential tsunami and seiche inundation areas; however, as described in IX(a), pollutants associated with construction equipment would not pose a substantial threat to the environment. Also, the project would not involve the introduction of pollutants or contribute to the release of pollutants. Therefore, while the project site is subject to inundation, construction and operation of the project would not result in the release of pollutants due to project inundation. Impacts would be less than significant.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less Than Significant Impact. The project site is located within the San Dieguito Creek groundwater basin in the South Coast Hydrologic region. In accordance with the Sustainable Groundwater Management Act (SGMA), the San Dieguito Creek groundwater basin is a very low priority basin. The RWQCB is responsible for the adoption and implementation of water quality control plans, issuance of discharge permits, and performance of other functions in relation to regulating the region's water quality. The Water Quality Control Plan for the San Diego Basin (RWQCB 2016) identifies the project site as within the Rancho Santa Fe hydrologic subarea (HSA) of the Solana Beach hydrologic area of the San Dieguito hydrologic unit (905.11). The San Dieguito River is listed as impaired on the Section 303(d) List and includes the lower basin of the San Dieguito Lagoon (for toxicity) and the San Dieguito Lagoon Mouth at Del Mar Dog Beach (for bacteria, high coliform count) (USEPA 2018). However, the project would not increase levels of pollutants outside of potential effects associated with temporary construction activities. Conformance with the Basin Plan water quality objectives would be demonstrated through compliance with applicable regulations and implementation of construction BMPs. Thus, the project would be consistent with the Basin Plan. In addition, the project would not adversely impact a groundwater management plan because the project would not impede groundwater replenishment and there are no sustainable groundwater management plans within the project vicinity (the nearest is located in San Pasqual Valley, approximately 14 miles east of the project). Therefore, as noted above, project implementation would not have the potential to result in significant adverse impacts to surface water and groundwater quality or otherwise conflict with the Basin Plan.

XI. Land Use and Planning

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a)	Physically divide an established community?	☐	☐	☐	■
b)	Cause significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	■	☐

a) Physically divide an established community?

No Impact. The project would replace an existing bridge that serves as an important north-south connection for residents and visitors of the coastal communities of Del Mar and Solana Beach, as well as the greater San Diego region. The project would not physically divide an established community. No impact would occur.

b) Cause significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Less Than Significant Impact. Federal, state, and local plans, policies, and ordinances that pertain to land use and transportation planning within the project area are contained in elements and policies of the following:

- Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966
- Section 6(f) of the Land and Water Conservation Fund Act of 1965
- Coastal Zone Management Act of 1972
- Complete Streets Act of 2008 (AB 1358)
- Caltrans' Deputy Directive DD-64-R1 (Complete Streets – Integrating the Transportation System)
- SANDAG Regional Complete Streets Policy
- City of Del Mar Complete Streets Policy
- San Diego Forward: The Regional Plan
- Regional Transportation Improvement Program (RTIP)
- Riding to 2050: The San Diego Regional Bike Plan
- City of Del Mar Community Plan (General Plan)
- Multiple Species Conservation Program
- San Dieguito River Park Concept Plan
- California Coastal Act
- City of Del Mar Local Coastal Program Land Use Plan and Implementing Ordinances
- City of Del Mar Municipal Code

These policies and regulations address a variety of issues, including development of a comprehensive regional transportation plan, efficient growth patterns, development at appropriate densities in accordance with existing community character, provision of open space and recreational opportunities, meeting the region's transportation needs, and protection against incompatible land uses. A detailed evaluation of the project's consistency with relevant adopted land use plans, policies, and ordinances is summarized below.

Consistency with Federal Plans and Policies

Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S.C. 303) protects public parklands and recreation lands; wildlife refuges; and historic sites of national, state, or local significance. Compliance with Section 4(f) is required for transportation projects that are undertaken by an operating administration of the USDOT or that may receive federal funding and/or discretionary approvals from USDOT. Section 4(f) properties located within 0.5 mile of the project site, including Del Mar Beach, Scripps Bluff Preserve and path, 21st Street Tennis Courts (Court Park), River Path Del Mar, and wildlife areas (San Dieguito Lagoon), are evaluated in XV.d of this IS/MND. Section 6(f) of the Land and Water Conservation Fund Act of 1965 (36 CFR 59.3) prohibits the conversion of designated recreational properties to a non-recreational purpose without the approval of Department of Interior's National Park Service. No properties subject to the Section 6(f) of the Land and Water Conservation Fund Act are located within the project study area.

Project implementation would not result in a temporary, permanent, or constructive use of any 4(f) or 6(f) properties located within the project area. No direct or indirect impacts to wildlife refuges or historic properties would occur, as none is located within the project study area. As described in further detail in XV.d of this IS/MND, the project would result in a *de minimis* impact to identified parks and recreational facilities, including Del Mar Beach, Scripps Bluff Preserve and path, and River Path Del Mar, relative to potential parking loss impacts for recreational users accessing these facilities. The temporary loss of a maximum of 60 spaces for a total of ~~20~~ 28 months (with lesser temporary losses during the overall construction period), as well as a permanent loss of 4 spaces, would not adversely affect the existing public coastal access to these resources. The project would not substantially impair activities, features, and attributes that qualify these resources for protection under Section 4(f) during construction or operation of the replacement bridge.

Consistency with Complete Streets Policies of the U.S., California, Caltrans, and the City

Complete Streets are designed to provide convenient routes and a variety of transportation options while enabling safe access for motorists, transit users, pedestrians, and bicyclists of all ages and abilities. The federal Complete Streets Act of 2009 defines Complete Streets policies and directs state departments of transportation and metropolitan planning organizations to adopt such policies and apply them to federally funded transportation projects. State, regional, and local governments and organizations have also adopted related policies, including California's Complete Streets Act of 2008 (AB 1358), Caltrans' Deputy Directive DD-64-R1 (Complete Streets – Integrating the Transportation System), SANDAG's Regional Complete Streets Policy, and the City's Complete Streets Policy.

Pedestrian travel currently is limited to the westerly pedestrian walkway. The project proposes to provide two-way pedestrian and bicycle movement across the bridge. Safety would be enhanced through the separation of northbound and southbound traffic lanes and bike lanes by a buffer (striped), and separation of pedestrian sidewalks at the outer edges of the bridge from the bike lanes by bridge railings. Concrete curbs and metal hand railings are proposed to line the eastern and western edges of the replacement bridge. These design features would be consistent with the applicable complete streets policies and directives in addressing the safety and mobility needs of bicyclists, pedestrians, transit users, and motorists.

Consistency with Regional Transportation Plans

San Diego Forward: The Regional Plan (SANDAG 2015) is a comprehensive plan adopted by SANDAG in October 2015 that integrates the Regional Transportation Plan, Sustainable Communities Strategy, and Regional Comprehensive Plan. The Regional Plan is built on an integrated set of public policies, strategies, and investments to maintain, manage, and improve the transportation system so that it meets the needs of the San Diego region through 2050. The 2021 RTIP is the program of proposed projects for major transportation improvements in the San Diego Region. It is consistent with San Diego Forward: The Regional Plan and incrementally implements the vision presented in the plan. The project is identified in the 2021 RTIP as part of a larger project identifying bridge retrofit projects receiving local match funds titled Camino Del Mar Bridge over San Dieguito River, Jimmy Durante Boulevard Bridge, Via de la Valley Bridge, Camino del Mar Overpass (Metropolitan Planning Organization [MPO] Identification number [ID] DM02). Riding to 2050: The San Diego Regional Bicycle Plan, adopted by SANDAG in 2010, encourages the development of a unified bicycle system throughout the San Diego region to serve the needs of all bicycle riders by implementing efficient and feasible connections to local and regional activity centers, transit facilities, and regional trail systems.

The project is consistent with the overall intent of the San Diego Forward: The Regional Plan, as well as the applicable goals and policies identified in Riding to 2050: The San Diego Regional Bike Plan, because it proposes to implement transportation improvements that would enhance regional pedestrian and bicycle access connections to neighboring jurisdictions including the City of San Diego and City of Solana Beach. Because the project would improve multi-modal functionality of existing Camino del Mar roadway and connectivity within the project area, the project would be compatible with existing local land use plans and land use designations. As noted above, the project is identified for funding in the 2021 RTIP and would be consistent with this plan.

Consistency with General Plan

City of Del Mar Community Plan (General Plan). The City of Del Mar Community Plan (City of Del Mar 1976, and as subsequently amended) is the City's General Plan that sets forth the comprehensive long-term plan for the physical development of the City of Del Mar, and provides a foundation for land use decisions within the City. In addition to the two General Plan elements that are published separately (i.e., Housing Element and Recreation Element), the Del Mar Community Plan (General Plan) is organized into three main sections that identify policies and components for each of the required General Plan elements. The three main sections include Environmental Management (containing Conservation, Seismic Safety, Open Space, and Safety), Transportation (containing Circulation, Scenic Highways, and Noise), and Community Development (containing Land Use and Housing). Applicable overarching goals and policy objectives of the City of Del Mar Community Plan (General Plan) that are most relevant to the project are located within the Transportation section, and include a redesign of Camino del Mar to improve its appearance as a scenic coastal route and accommodate low-speed vehicular traffic; improvements to the safety of Camino del Mar pedestrian crossings, particularly in the north and south ends of the community; provision of a continuous north-south bicycle network through the City; and preservation and improvements to pedestrian access to and along beaches and the bluffs above the beach by use of all public rights-of-way and prescriptive public easements.

The project would be consistent with the relevant goals and objectives of the Community Plan (General Plan). The project would encourage pedestrian-oriented non-motorized modes of transportation through the provision of safe two-way pedestrian access and continued accommodation of bicycle

movement across the bridge, which also would minimize air pollution. Pedestrian access to recreational areas, including beaches and cliffs, would be preserved throughout project construction and improved as part of project design. Accordingly, the project would be consistent with the relevant objectives of the Community Plan (General Plan).

Sea Level Rise Adaptation Plan. The City of Del Mar adopted a Sea Level Rise Adaptation Plan (Adaptation Plan) in May 2018 (Environmental Science Associates 2018) that is incorporated by reference with the City's General Plan Safety Element per City Council action taken on March 4, 2019 (City Council Resolution 2019-13). The Adaptation Plan addresses coastal risks related to projected sea level rise that were identified in the Del Mar Coastal Hazards, Vulnerability, and Risk Assessment (Environmental Science Associates 2016) and Addendum (Environmental Science Associates 2018), as accepted by the City Council in October 2018 (City Council Resolution 2018-67). The Adaptation Plan addresses potential coastal hazards including erosion, flooding, projected increases in frequency and intensity of storms, and projected sea level rise. Roads and bridges, including Camino del Mar roadway and bridge, are projected to be highly vulnerable to coastal flooding, and a range of adaptation options/recommendations are identified to provide mechanisms to protect Del Mar's low-lying areas from increased flood risk due to projected sea-level rise. The proposed additional approximately 29 feet in bridge length and 7.5 feet in bridge height near the center of the bridge would accommodate a mid-range sea level rise scenario of 38 inches by the year 2100 during a 100-year flood while maintaining safe roadway design and avoiding roadway conflicts with driveways and coastal access points. As discussed in the Project Description, other sea level rise scenarios were evaluated to determine the appropriate bridge height during the preliminary design process. The noted mid-range sea level rise scenario is the highest elevation where the bridge remains partially useable (in service) during a 100-year flood event. The proposed design would accommodate a practical amount of sea level rise, but not extreme conditions where the surrounding community would be submerged underwater and bridge use for vehicular mobility would be irrelevant. The project would be consistent with the recommendations in the Adaptation Plan.

Multiple Species Conservation Program. Project consistency with the MSCP is detailed in Section IV.f of this IS/MND. The project would not impact land identified in the MSCP for conservation, conflict with the goals of the MSCP, or prevent or hinder implementation of the MSCP.

San Dieguito River Park Concept Plan. The San Dieguito River Park Concept Plan (San Dieguito River Park Joint Powers Authority [JPA] 1994) was prepared to establish the vision and goals for the future use of the San Dieguito River Valley. Although the project would result in temporary and permanent impacts to the San Dieguito River (lagoon), such impacts to be reduced to the extent feasible through implementation of avoidance, minimization, and mitigation measures. The project would not preclude the JPA from implementing the vision and major goals of the San Dieguito River Park Concept Plan.

Consistency with Coastal Zone Management Regulations and Plans

The CCA specifies California's coastal zone management program for purposes of complying with the Federal CZMA. The policies within Chapter 3 of the CCA include the protection and expansion of public access and recreation; the protection, enhancement, and restoration of environmentally sensitive areas; the protection of agricultural lands; the protection of scenic beauty; and the protection of property and life from coastal hazards. The CCC is responsible for implementation and oversight under the CCA. The California Coastal Act delegates power to each local jurisdiction along California's coastline to enact its

own Local Coastal Program for the portion of its area within a specified Coastal Zone. LCPs determine the short- and long-term use of coastal resources in their jurisdiction consistent with the CCA goals.

The City's LCP is composed of the certified Land Use Plan (LUP) and Implementing Ordinances, including associated maps and exhibits, which have been certified by the CCC as being consistent with and meeting the requirements of the CCA. The LCP LUP was certified by the CCC in March 1993 and the Implementing Ordinances were certified in September 2001. This provided the City of Del Mar permit authority over coastal development within the City (City 1993a and 1993b). The LCP LUP is a compilation of the goals, policies, and recommendations adopted by the Del Mar City Council to guide future development as identified in the Community Plan (General Plan); various policy reports; and the San Dieguito Lagoon Enhancement Program; as well as the implementing code regulations. The LUP addresses shoreline resources, hazards, and development policies and regulations, including the beach, coastal bluffs, runoff and erosion control, flood hazard areas, and coastal access.

Compliance with the federal CZMA and CCA is determined through the City's LCP process. To ensure development activity within the coastal zone complies with the CCA, projects are required to demonstrate compliance with the LCP policies and regulations. The project would be consistent with the CCA's development policies to maximize opportunities for all segments of the population to gain access to and enjoy the coastline, protect scenic views and coastal resources, and ensure that new development does not create or significantly contribute to erosion. Implementation of the project would result in an increase of public access to and within the project area. The project would be consistent with applicable LUP goals and policies relative to protecting access to coastal recreation areas, including minimizing disturbance of natural topography and vegetation (Goal IV-A); prioritizing pedestrian and bicycle traffic over vehicular traffic (Goal IV-B); preserving existing views and view corridors (Goal IV-C); and maximizing beach access (Goal IV-D).

The LCP Implementing Ordinances identify zoning and regulatory controls to protect coastal resources and public access including specific overlay zone regulations (i.e., beach, bluff, lagoon, open space, and floodplain resource protection), seawall and shoreline protection permits, public access, coastal development permits, and parking regulations. Portions of the project site and surrounding properties are located within the Lagoon and Floodplain overlay zones; the specific zoning regulations/LCP regulations associated with these overlays are evaluated below.

Lagoon Overlay Zone (Chapter 30.53). Project impacts to wetlands, including CCC jurisdictional waters, have been evaluated in the BLR prepared for the project (HELIX 2022a). Temporary impacts to 1.90 acres and permanent impacts to 0.31 acre of potential CCC wetlands were identified. The project has been designed to minimize impacts to open water and beach jurisdictional areas to the greatest extent practicable. Impacts, however, cannot be completely avoided due to the location of the existing facility and abutting roadway, which requires new bridge supports in proximity to the habitat. Portions of the temporary and permanent impacts are to areas that are below the current bridge span. The larger diameter existing pilings would be removed and replaced with fewer structures with lesser girth, which is expected to improve tidal circulation and create a better tidal circulation, thus offsetting temporary impacts. The localized nature of the activities means that the temporal and spatial impacts to the surrounding environment from the replacement of the pilings are minimal. As described in IV.d, mitigation for impacts to open water and jurisdictional beach habitat is not proposed, since these areas would return to pre-project conditions or better following construction of the bridge. To ensure that residual impacts remain negligible, final mitigation requirements for impacts to open water and

jurisdictional beach habitat would be determined during the permit process, in consultation with the resource agencies.

Water quality could be adversely affected during construction by potential surface runoff, including sedimentation from disturbance areas. If it were to occur, decreased water quality could adversely affect vegetation, aquatic animals, and terrestrial wildlife that depend upon these resources. Appropriate BMPs would be implemented during construction to address potential water quality impacts. These may include, but are not limited to: (1) installing erosion and sediment control devices such as silt fences, fiber rolls, bonded fiber matrix, and gravel bags in appropriate locations; (2) placing temporary filters at storm drain inlets (e.g., gravel bags/filter fabric); (3) designating containment areas for material storage (e.g., covering/berming of soil stockpiles); and (4) providing containment areas for solid waste storage and concrete washout.

Based on the above considerations, the project would be consistent with the Lagoon Overlay Zone related to wetland habitat protection, retention of native habitats, and drainage and erosion control.

Floodplain Overlay Zone (Chapter 30.56). The project has been designed and would be constructed in compliance with applicable City requirements for development within the floodplain. The proposed additional bridge height near the center of the bridge would accommodate a mid-range sea level rise scenario of 38 inches by the year 2100 during a 100-year flood (National Research Council 2012), while maintaining safe roadway design and avoiding roadway conflicts with driveways and coastal access points. In scenarios where the projected sea level rise exceeds an increased water surface elevation of 38 feet, the bridge would cease to be connected to a functional roadway system due to flooding of the connecting roadway to the south. Therefore, the proposed design would accommodate a practical amount of sea level rise, consistent with the City's sea level rise adaptation recommendations and requirements for development within a floodplain overlay zone.

Public Access (Chapter 30.61). As discussed above, the project would be consistent with regulations related to public access that are contained in this chapter of the Implementing Ordinances. The intent of the public access provisions is to "ensure that physical access is provided to coastal recreation areas for the general public without creating a public safety concern, overburdening the City's public improvements, degrading the City's natural resources, or causing substantial adverse impacts to adjacent private properties."

Coastal Development Permits (Chapter 30.75). The project would be required to obtain a CDP issued by the City and the CCC. The permit process requires evaluation of project consistency with the City's certified LCP, including the Public Access and Overlay Zone provisions of the Implementing Ordinances, as well as the Public View protection policies IV-22 through IV-27 of the LCP LUP.

Parking (Chapter 30.80). As evaluated in the Parking Study prepared for the project, the temporary loss of parking during construction would comprise 43 percent of identified available parking along Camino del Mar within the project impact footprint (Kleinfelder 2021). A maximum of 60 out of 140 spaces would be temporarily impacted for a total of ~~20~~ 28 months during stages 2 and 3, with fewer impacts for the remaining ~~7~~ 8 months of construction. This temporary loss of parking is unavoidable but would not affect the public's ability to continue to access coastal resources, including parks and recreational facilities, in the project study area.

While the project has the potential to result in temporary and/or permanent impacts to visual resources, biological resources including wetlands, and parking, it has been designed to avoid impacts to

the maximum extent feasible while maintaining safe roadway design and avoiding conflicts with coastal access points. As noted above, measures are identified to address potential inconsistencies, and the project would be consistent with other policies because it provides critical public access to the coast (for residents, workers, and visitors), accommodates pedestrian and bicycle modes of transportation, maintains public coastal access and recreation opportunities, and would not adversely affect scenic vistas or substantially degrade the existing visual character or quality of public views of the site and surroundings post construction. Moreover, evaluation of project consistency with, and implementation of, the applicable provisions of the LCP Implementing Ordinances is required for the project to obtain a CDP. Based on the above considerations, potential environmental impacts due to a conflict with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect would be less than significant.

XII. Mineral Resources

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	■
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	■

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. The Surface Mining and Reclamation Act of 1975 required the classification of land into mineral resource zones (MRZ), according to known or inferred mineral resource potential. The process was based solely on geology, without regard to existing land use or land ownership. The proposed project is located in an area designated as MRZ-1 and MRZ-3, which includes areas where there are no significant mineral deposits present or likely to be present, as well as areas where mineral resource significance is undetermined, respectively (DOC 2015). No existing or planned future mining operations occur within the project site or surrounding area, nor is it zoned or planned for such uses. Therefore, implementation of the project would not result in the loss of availability of a known mineral resource that would be of value to the region or the residents of the state. No impact would occur.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

No Impact. There are no known mineral resources on site as designated by a local general plan, specific plan, or other land use plan. As described in XII.a, no existing or planned mining operations occur on site or in the immediate project vicinity. Therefore, implementation of the project would not result in the loss of availability of a locally important mineral resource recovery site. No impact would occur.

XIII. Noise

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:					
a)	Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	■	☐	☐
b)	Generation of excessive groundborne vibration or groundborne noise levels?	☐	■	☐	☐
c)	For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	■

The discussion below is based on Noise Study Report prepared by HELIX (2022c) and included as Appendix I to this IS/MND.

Discussion

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, such as sensitive habitat, residential dwellings, schools, transient lodging (hotels), hospitals, educational facilities, exterior recreational facilities, and libraries. Receptors are individual locations that may be affected by noise.

Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations (Caltrans 2013) are considered “vibration-sensitive.” The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools. The nearest land uses in the project area that are subject to annoyance from vibration include the single-family residences located directly south of the bridge. The closest residence is located approximately 30 feet west of the project site.

Noise-sensitive land uses that have the potential to be affected by changes in traffic noise levels from the proposed bridge replacement consist of single- and multi-family residential uses on both sides of Camino del Mar along the southern portion of the proposed bridge alignment (see Figure 10). Multi-family residential uses are located on the eastern side of the roadway; the closest residential structure is approximately 30 feet from the edge of the roadway. Two outdoor use areas associated with these multi-family residences, a patio and a pool area, are also located approximately 30 feet from the edge of

the roadway. The multi-family residential building and outdoor use areas are at a slightly higher elevation than the roadway (approximately five feet).

Single-family residential uses are located on the western side of the roadway along the southern portion of the proposed bridge alignment. While the residential property boundaries are located approximately 50 feet from the edge of the roadway, most of the residences themselves are set back from the roadway at a distance of approximately 175 feet, with the exception of two residences slightly to the north that are located approximately 60 feet from the edge of the roadway. These residences on the western side of the roadway are generally at the same elevation as the roadway. A six-foot-tall concrete wall is located between the residential properties and the roadway, which currently provides attenuation from traffic noise based on the existing roadway elevation.

Heading north along Camino del Mar, the residential properties end at the start of the existing bridge. Beach and lagoon are present on either side of the existing bridge, which has an existing midpoint height of approximately 17 feet. North of the bridge and along the northern portion of the proposed bridge alignment, beach area is located to the west at a slightly lower elevation than the roadway. Specific topography for the roadways and the surrounding residential development was incorporated into noise modeling conducted for the project.

The Noise Study Report prepared for the proposed project includes the results of a site visit and ambient noise survey conducted on August 24, 2021 by HELIX. The short-term measurements were at two locations (ST-1 and ST-2) and the long-term measurements were taken at one location (ST-1; see Figure 19, *Noise Measurement Locations*). The primary ambient noise source in the project vicinity was documented to include traffic along nearby roadways, including I-5, San Dieguito Drive, and Racetrack View Drive. Noise levels observed ranged between 46.7 to 61.9 dBA L_{EQ} for the long-term measurement taken over a 24-hour period. Short-term noise measurements were 63.2 and 63.7 dBA L_{EQ} at ST-1 and ST-2, respectively.

Both Caltrans and the City have established standards for construction noise. Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects (Protocol) specifies the policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction of federal or federal-aid highway projects. The City's goals for transportation noise sources are published in the Community Plan (General Plan) Transportation Element, Noise Section. This section of the Community Plan (General Plan) identifies 65 Community Noise Equivalent Level (CNEL) as the maximum noise level compatible with residential land uses. The DMMC regulates noise produced by construction activities on any property that may affect occupants of nearby properties. Construction noise for the project is regulated by Section 9.20.050 of the DMMC, which identifies construction noise level limits and states:

> Any person who operates powered construction or landscape equipment and/or who erects, constructs, demolishes, excavates for, alters or repairs any building or structure within the City of Del Mar in such a manner as to cause noise to be received beyond the boundaries of the property on which the construction work is occurring shall comply with the following:
>
> A. No construction work shall be performed on Sundays or City holidays.
>
> B. No construction work shall be performed before 9:00 a.m. or after 7:00 p.m. on Saturday.



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Source: Aerial (NearMap, 2019)

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Noise Measurement Locations

Figure 19

C. No construction work shall be performed before 7:00 a.m. or after 7:00 p.m. on Monday through Friday.

D. Construction activity shall not cause an hourly average sound level greater than 75 decibels on property zoned or used for residential purposes. Exception: A person may perform construction work on the person's own property, provided such construction activity is not carried on for profit or livelihood, between the hours of 10:00 a.m. and 5:00 p.m. on Sundays and City holidays."

Section 14-8.02 (Noise Control) of Caltrans standard specifications provides information that can be considered in determining whether construction would result in adverse noise impacts (Caltrans 2020b). The specification states that construction must not exceed maximum noise levels (L_{MAX}) of 86 dBA at 50 feet from the construction site from 9:00 p.m. to 6:00 a.m.; and must equip an internal combustion engine with the manufacturer-recommended muffler.

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less Than Significant with Mitigation Incorporated. The project has the potential to result in temporary and permanent increases in ambient noise levels during construction and operation of the replacement bridge.

Construction Noise

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Construction activities could temporarily produce elevated short-term noise levels at NSLUs. The project is estimated to be constructed over ~~27~~ 36 months with five distinct construction stages: site preparation, demolition and replacement of east side of the bridge, demolition and replacement of west side of the bridge, bridge median improvements, and final improvements. A variety of standard construction equipment would be used, including, but not limited to, backhoes/loaders, excavators, tractors, dozers, concrete breakers, concrete saws, pile installation equipment, and miscellaneous trucks. Hourly average noise levels from construction at the project site were determined using the Roadway Construction Noise Model (RCNM) (FHWA 2008). Individually, these pieces of construction equipment generate noise levels ranging from approximately 77 to 100 dBA L_{MAX} and from approximately 73 to 94 dBA L_{EQ} at a distance of 50 feet. Noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance. It is likely that multiple pieces of equipment would be operating simultaneously near each other, thus having the potential to combine to generate hourly average noise levels exceeding the Caltrans construction noise standard of 86 dBA L_{MAX} at 50 feet during nighttime or early morning hours (before 6:00 a.m. or after 9:00 p.m.).

Noise levels would also potentially exceed the City's construction noise standard of 75 dBA L_{EQ} (1-hour) at nearby residences located within 50 feet of the construction work areas. The existing concrete walls between Camino del Mar and the residences on the western side of the roadway would partially reduce construction noise levels experienced at these residences; however, because the equipment that would be used would generally be taller than the wall, noise levels would still likely exceed the 75 dBA L_{EQ} (1-hour) standard. Further, there is no noise wall to provide attenuation for the residences on the eastern side of the roadway. In order to reduce noise levels at the nearby residences, project

construction would be required to comply with standard construction noise BMPs. Implementation of mitigation measure NOI-1 would reduce construction noise levels to less than significant under standards established by both the City and Caltrans.

Operational Noise

Predicted traffic noise levels for conditions with and without the project were evaluated based on Caltrans and City criteria. The project would not result in increased traffic levels; rather, the potential for increased traffic noise levels at nearby receptors were evaluated due to the raised elevation of the bridge. Six receptors were evaluated, including four at single-family residential properties to the west of Camino del Mar (R1 to R4) and two at exterior use areas associated with multi-family residences to the east of Camino del Mar (R5 and R6). The receptor locations are shown on Figure 20, *Modeled Receptor Locations*.

To assess project impacts using Caltrans criteria, traffic noise levels with and without the project were calculated using traffic volumes that would be expected under LOS C conditions (which are considered to be the highest volume of traffic that a roadway can support under free-flowing conditions). As shown in Table 9, *LOS C Peak Hour Noise Levels*, the traffic noise modeling indicates that traffic noise levels at outdoor use areas of NSLUs southeast of the bridge (receptors R5 and R6) are predicted to be 66 dBA $L_{EQ(h)}$. Because the predicted noise level approaches Caltrans' 67-dBA $L_{EQ(h)}$ exterior noise abatement criteria (NAC) for residential uses, traffic noise impacts are predicted at these areas, and noise abatement must be considered.

Table 9
LOS C PEAK HOUR NOISE LEVELS

Receiver Number	Without Project Noise Level (dBA L_{EQ})	With Project Noise Level (dBA L_{EQ})	Increase due to Project	Approach 67 dBA L_{EQ} NAC?[1]
R-1	60	61	1	No
R-2	61	61	0	No
R-3	64	64	0	No
R-4	58	58	0	No
R-5	66	66	0	Yes
R-6	66	66	0	Yes

[1] Caltrans NAC for exterior noise levels in residential areas.

To assess project impacts using City criteria, traffic noise levels both without and with the project were estimated using existing and future (year 2040) traffic volumes. As shown in Table 10, *Existing and Existing Plus Project Noise Levels*, and Table 11, *Future and Future Plus Project Noise Levels*, noise levels in adjacent residential areas would range from 59 to 67 CNEL and would exceed the City's exterior noise standard of 65 CNEL at receivers R-5 and R-6. Noise abatement would be required for the project to be in compliance with City standards.



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Source: Aerial (NearMap, 2019)

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Modeled Receptor Locations

Figure 20

Table 10
EXISTING AND EXISTING PLUS PROJECT NOISE LEVELS

Receiver Number	Existing No Project (CNEL)	Existing Plus Project (CNEL)	Increase due to Project	Exceed 65 CNEL Limit?[1]
R-1	61	62	1	No
R-2	62	63	1	No
R-3	65	65	0	No
R-4	59	59	0	No
R-5	67	67	0	Yes
R-6	67	67	0	Yes

[1] City threshold for exterior noise levels in residential areas.

Table 11
FUTURE AND FUTURE PLUS PROJECT NOISE LEVELS

Receiver Number	Future No Project (CNEL)	Future Plus Project (CNEL)	Increase due to Project	Exceed 65 CNEL Limit?[1]
R-1	61	62	1	No
R-2	63	63	0	No
R-3	66	65	-1	No
R-4	60	59	-1	No
R-5	67	67	0	Yes
R-6	67	67	0	Yes

[1] City threshold for exterior noise levels in residential areas.

Detailed modeling analysis was conducted for a six-foot-high barrier with a length of approximately 87 feet and a seven-foot-high barrier with a length of 59 feet along the periphery of the affected outdoor use areas between the use areas and the roadway, which would provide attenuation for receptors R5 and R6 (refer to Figure 21, *Noise Barrier Location*). The noise barrier requirements were determined through CadnaA modeling, which considers the topography of the project site and surrounding areas. Mitigation measure NOI-2 shall be implemented to decrease traffic noise impacts associated with the project.

Mitigation Measures

NOI-1 **Construction Noise Management Plan**. Prior to the initiation of construction activities, a Construction Noise Management Plan shall be prepared that identifies measures to comply with the following:

1. The construction contractor shall be required to work in such a manner so as not to exceed a 1-hour average sound level of 75 dBA at any noise-sensitive land use (residential). Sound levels may be limited by sound control devices, limiting the number of equipment operating at once, or installation of temporary noise barriers between the construction site and sensitive receptors.

2. Construction equipment shall be properly outfitted and maintained with manufacturer recommended noise-reduction devices to minimize construction-generated noise.

3. Stationary construction noise sources such as generators or pumps shall be located at least 100 feet from noise-sensitive land uses.

4. Laydown and construction vehicle staging areas shall be located as far from noise-sensitive land uses as feasible.

NOI-2 Exterior Use Area Noise Barrier. To reduce traffic noise levels at exterior use areas where Caltrans and City noise standards would be exceeded, either a six-foot-high, 87-foot-long noise barrier, or a seven-foot-high, 59-foot-long noise barrier shall be provided along the fence line of the exterior use area of NSLU R-5. Both are shown on Figure 21. The noise barrier must be solid. It can be constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, as long as there are no cracks or gaps, through or below the barrier. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least one-inch total thickness or have a density of at least 3.5 pounds per square foot. Where architectural or aesthetic factors allow, glass or clear plastic 3/8 of an inch thick or thicker may be used, if it is desirable to preserve a view. Sheet metal of 18-gauge (minimum) may be used if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Any door(s) or gate(s) must be designed with overlapping closures on the bottom and sides and meet the minimum specifications of the materials described above. The gate(s) may be of wood with a thickness of at least one inch, solid-sheet metal of at least 18-gauge metal, or an exterior-grade solid-core steel door with prefabricated door jambs.

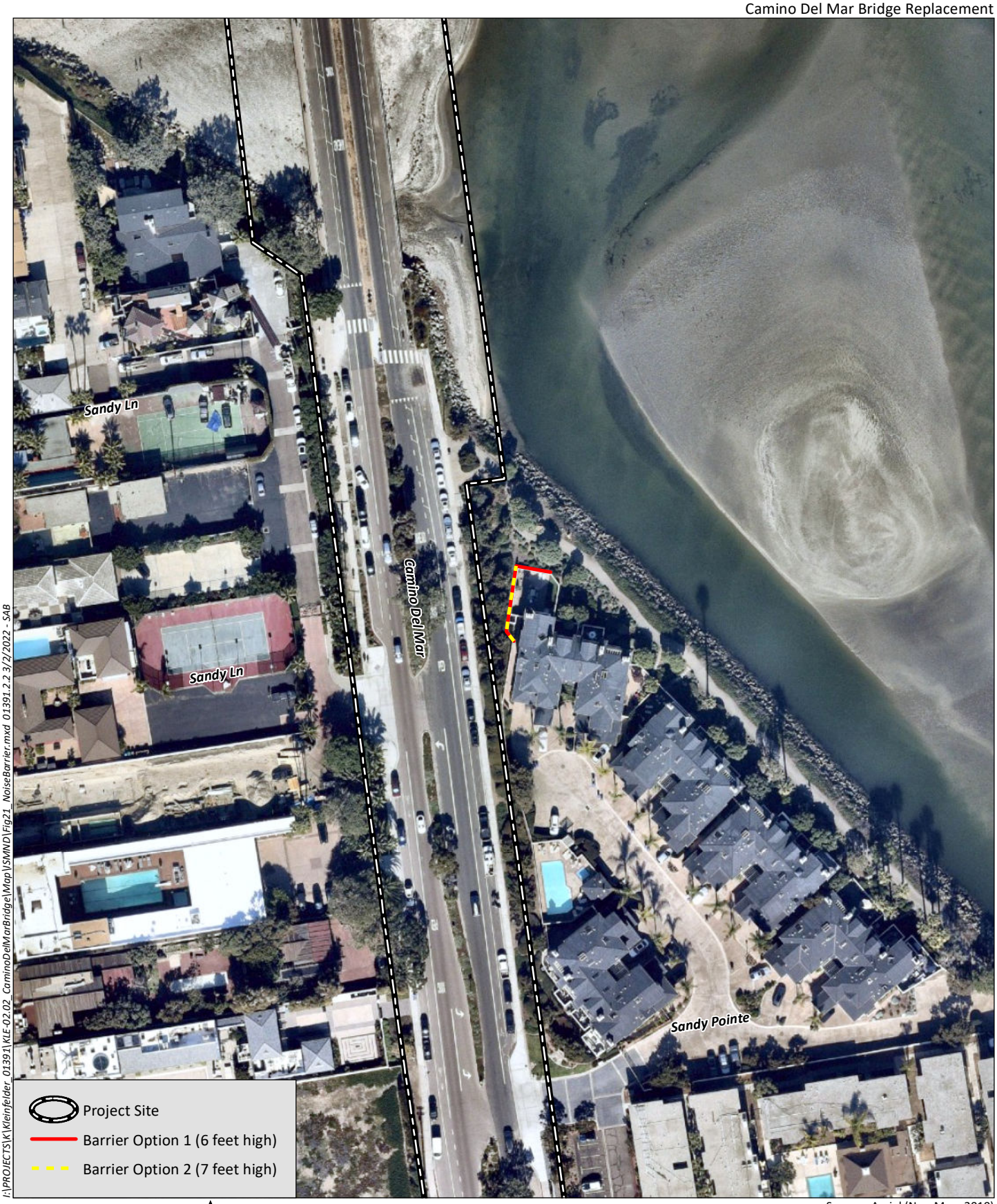
With implementation of mitigation measures NOI-1 and NOI-2, construction and operational noise levels would be less than significant under standards established by both the City and Caltrans.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant with Mitigation Incorporated. The two primary vibration-generating components anticipated to be used during project construction include a vibratory pile driver for installation of pilings for the construction platforms and a vibratory roller for compaction and pavement of the new roadway. Per Caltrans' *Transportation and Construction Vibration Guidance Manual* (Caltrans 2020c), a vibratory pile driver typically generates a vibration level of 0.65 inch per second peak particle velocity (PPV) at a distance of 25 feet. Based on this vibration level, a vibratory pile driver could generate vibration levels in excess of Caltrans' 0.1-inch per second PPV strongly perceptible annoyance potential criteria for steady state sources (Caltrans 2020c) within a distance of 110 feet.[3] Two residential dwellings, both located near the southwestern corner of the project work area, could occur within this distance to the use of a vibratory pile driver; therefore, impacts are considered potentially significant and mitigation measure NOI-3 is required. It should be noted that while vibration levels may exceed the criteria, most use of a vibratory pile driver for project construction would occur outside of 110 feet from residential dwellings, and thus not result in excessive vibration levels.

A vibratory roller typically generates a vibration level of 0.21 inch per second PPV at a distance of 25 feet (Caltrans 2020c). Based on this vibration level, a vibratory roller could generate vibration levels in excess of Caltrans' 0.1-inch per second PPV strongly perceptible annoyance potential criteria for steady state

[3] Equipment PPV = Reference PPV * $(25/D)^n$(in/sec), where Reference PPV is PPV at 25 feet, D is distance from equipment to the receptor in feet, and n (the value related to the attenuation rate through the ground) is 1.1 (for hard ground) or 1.3 (for sand; formula from Caltrans 2020c.



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Source: Aerial (NearMap, 2019)

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Noise Barrier Location

Figure 21

sources within a distance of 50 feet. No residential dwellings would be located within 50 feet of the use of a vibratory roller for this project. In addition, a vibratory roller is a mobile piece of equipment that would only generate vibration at a given receptor for a short amount of time as it passes by. As such, vibration impacts from use of a vibratory roller would be less than significant.

Mitigation Measure

NOI-3 Vibratory Pile Driver Vibration Monitoring and Reduction. If a vibratory pile driver is used within 110 feet of a residential dwellings, vibration monitoring shall be conducted at the residential locations. If the measured vibration level exceeds Caltrans' 0.1-inch per second PPV strongly perceptible annoyance potential criteria for steady state sources, the power level of the pile driver shall be reduced or vibration shielding via a trench or alternative method shall be implemented to reduce vibration levels below the 0.1-inch per second PPV level.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The project is not located within two miles of a public airport or a public use airport. The closest public airport is McClellan-Palomar Airport, approximately 13 miles northeast of the project site. The nearest private, or non-public airport is the Marine Corps Air Station Miramar, located approximately 10 miles to the southeast. At this distance, no impacts related to airport noise would occur at the project site.

XIV. Population and Housing

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	■
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	■

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. The project would not result in the construction of homes or businesses or extension of a roadway or utilities; therefore, the project would not directly or indirectly induce population growth. No impact would occur.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact. The project would not displace housing or people and would not require the construction of replacement housing elsewhere. No impact would occur.

XV. Public Services

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection?	☐	☐	■	☐
b) Police protection?	☐	☐	■	☐
c) Schools?	☐	☐	☐	■
d) Parks?	☐	☐	■	☐
e) Other public facilities?	☐	☐	☐	■

a) Fire protection?

Less Than Significant Impact. The Del Mar and Solana Beach Fire Departments (DMFD) provide fire and emergency protection services, including fire suppression and protection, emergency medical services, vehicle accident response, rescue, and hazardous material response, to residents and visitors of the cities of Del Mar and Solana Beach. The 2.5-square-mile service area of the DMFD includes Del Mar, as well as surrounding areas such as Solana Beach, Encinitas, and portions of San Diego (City 2021b). The Del Mar fire station is located on the Del Mar Fairgrounds at 2200 Jimmy Durante Boulevard, approximately 0.4 mile east of the project boundary. The Solana Beach fire station is located at 500 Lomas Santa Fe Drive, approximately one mile northeast of the northernmost extent of the project boundary. The project would not result in an increase in response times for fire protection or emergency services, since the project would not increase traffic or introduce new uses that would require such services. Existing emergency services provided by DMFD would continue to adequately serve the project site, and implementation of the project would not require construction of new or altered facilities in order to maintain acceptable service ratios or response times. Response times may be temporarily impacted during the ~~12~~ 14 nighttime full bridge closures when traffic would be detoured around the bridge. Impacts would be avoided or minimized through agency coordination and implementation of a TCP. The TCP would provide for adequate emergency vehicle access through the project area throughout the duration of the construction period. Therefore, impacts would be less than significant.

b) Police protection?

Less Than Significant Impact. The San Diego County Sheriff's Department (Sheriff's Department) provides contract law enforcement services, including patrol, traffic, and investigative services for the cities of Del Mar and Solana Beach, among other incorporated and unincorporated areas of the County. Overall, the Sheriff's Department serves an area of approximately 4,500 square miles, which includes incorporated cities and unincorporated areas of the County (San Diego County Sheriff's Department 2021). The incorporated cities of Del Mar, Solana Beach, and Encinitas are served by the North Coastal Station located at 175 North El Camino Real in the City of Encinitas (approximately 7.5 miles from the project site). The North Coastal Station provides public safety services to more than 80,000 residents over 60 square miles. It is supported by numerous divisions ranging from patrol, traffic, community service officers, senior volunteers, area detectives, professional staff, and a community-oriented policing and problem-solving unit.

The City of Del Mar Park Ranger Division, based at Del Mar City Hall, provides protection of beaches, parks, lagoons, preserves, waterways, and city facilities. The Park Ranger Division is comprised of a park ranger and Beach Community Officers. The Park Ranger is a law enforcement and emergency response officer and is a member of the lifeguard specialized rescue team, responding to cliff, boat, swift water, search and recovery, and scuba rescues (Ralph Anderson and Associates 2015). The Beach Community Officers assist the Park Ranger and lifeguard staff in providing information to the public, responding to beach and park emergencies, reporting and responding to illegal activity within the City, and issuing warnings and writing citations. The officers of the Park Ranger Division patrol over approximately 2.5 miles of beach, area bluffs and preserves, and community parkland.

The project would not result in an increase in response times for emergency services, since the project would not increase traffic or introduce new uses that would require emergency services. Existing emergency services would continue to adequately serve the project site, and implementation of the project would not require construction of new or altered facilities in order to maintain acceptable service ratios or response times. Response times may be temporarily impacted during the ~~12~~ 14 nighttime full bridge closures when traffic would be detoured around the bridge. Impacts would be avoided or minimized through agency coordination and implementation of a TCP. The TCP would provide for adequate emergency vehicle access through the project area throughout the duration of the construction period. Therefore, impacts would be less than significant.

c) Schools?

No Impact. The project site is within the boundary of the Del Mar Union School District (DMUSD). DMUSD schools within the project vicinity include the Del Mar Hills Academy Elementary School located approximately 1.8 mile southeast of the project site and Del Mar Heights Elementary School located approximately 2.2 miles southeast. There are no other public schools within two miles of the project site. One private school, St. James Academy, is located approximately 0.4-mile northeast of the northernmost extent of the project boundary. Physical impacts to school facilities and services are usually associated with population in-migration and growth, which increase the demand for schools. The project would have no effect on population growth because the project does not involve any housing or other opportunity for population increase in the area. Therefore, the project would not result in an increased demand requiring the need for new or physically altered school facilities. No impact would occur.

d) Parks?

Less Than Significant Impact. Parks and recreational facilities identified within 0.5-mile of the project study area include areas of public beach, preserve, tennis courts, public trails, and the State Fairgrounds. Figure 22, *Del Mar Public Paths and Trails*, depicts the public paths, trails, and parks and recreational areas that are in the project's general vicinity. Potential impacts associated with temporary and permanent use of facilities identified within a 0.5-mile radius of the project site are summarized below. The next closest public park beyond this radius is Powerhouse Park, located in the 1600 block of Coast Avenue, approximately 0.85 mile from the southern edge of the bridge (City 2018). Powerhouse Park would be beyond reasonable direct or indirect effects of project construction, and no long-term adverse effects would occur.

Del Mar Beach

The City has public beach shoreline adjacent to its entire westerly boundary, which is collectively referred to as Del Mar Beach. Portions of the beach located immediately west of the bridge include areas both north and south of the lagoon outlet used for passive and active recreational activities. Potential impacts to the beach are associated with the bridge location on either side of the San Dieguito River where it enters the ocean. Approximately 0.21 acre north of the river mouth and 0.15 acre south of the river mouth are estimated to be incorporated into areas crossed by the expanded bridge. A total of 1.29 acres of temporary impacts to beach areas is conservatively estimated to occur during all construction phases combined. The temporary area of impact would be restricted to the area immediately adjacent to improvements. Engineering review shows that there is ample space to temporarily relocate and store clean beach sand moved during falsework installation and removal of existing bridge piers at beach level within the temporary construction footprint of the bridge until it can be reused. Loss of sand volume would be limited to the areas where new bridge piers would be installed. The minimal use of beach sands would be linear and incremental in nature and would not occur along the ocean front. It is a small percentage (approximately 18 percent) of the sand within the study area and an even smaller portion of the overall sand area available within Del Mar Beach. Bridge construction activity would be limited to the restricted construction area delineated on project plans and would not encroach into beach areas beyond that location delineated as an Environmentally Sensitive Area. All project-related activities would be prohibited within the delineated Environmentally Sensitive Area.

Scripps Bluff Preserve

The Scripps Bluff Preserve is a public park and open space preserve that is sited on a 4.3-acre mesa located northwest of the project alignment along the coastal bluff that is referred to as "North Bluff," above the ocean and north of the San Dieguito Lagoon river mouth. Public access to the Scripps Bluff Preserve is provided via a paved access path constructed into the east-facing slope of the bluff landform that connects to the beach. Recreational uses are "passive" with views of the ocean, coastline, and areas to the east. No organized sports/activities are allowed. The Scripps Bluff Preserve would not be encroached upon by any of the bridge improvements or construction activities. No permanent or temporary conflicts with the existing or future use of the Preserve would occur.

21st Street Tennis Courts (Court Park)

The 21st Street Tennis Courts (201 Court Street), also referred to as Court Park, include two public tennis courts and a half-basketball court located near the intersection of 21st Street and Court Street. These



Del Mar (Area) Public Parks, Paths and Trails

Public Paths

- P1 Thousand Steps (Ocean View Ave to Torrey Point Rd)
- P2 Ocean Access (Pine Needles Extension, Ocean View to CDM)
- P3 Gunther's Alley (Crest Rd to Hoska Ln)
- P4 Hidden Gulch (Crest Rd to Klish Way)
- P5 Short Cut (City Alley - 10th to 11th)
- P6 Slim Lane (Cuchara Dr to Cuchara Dr)
- P7 Friendship Way (Upper Rimini Rd to Lower Rimini Rd)
- P8 Canyon Steps (15th to Forest Way)
- P9 Shady Lane (Serpentine Dr to Seaview Ave)
- P10 Luzon Footpath (Seaview Ave to Luzon Ln)
- P11 David Way (David Way to Seaview Ave)
- P12 CDM to RR Station
- P13 Ocean Avenue (10th to 9th)
- P14 DM Woods to Bluff
- P15 DM Canyon Preserve (Bike/Pedestrian Path West of CDM)
- P16 River Path Del Mar
- P17 James Scripps Bluff
- P18 Crest Rim
- P19 Hidden Pines (Torrey Pines Reserve)
- P20 West Del Mar River Path

Trails

- T1 Boardwalk
- T2 Crest Canyon Reserve Trail
- T3 Dust Devil Nature Trail East Loop
- T4 Dust Devil Nature Trail North Loop
- T5 Dust Devil Nature Trail West Loop
- T6 Lagoon Trail

Parks and Recreational Areas

- Crest Canyon Park
- Del Mar Canyon Preserve
- Powerhouse Park
- San Dieguito Lagoon
- Scripps Bluff Preserve
- Sea Cliff Park
- Seagrove Park
- Shores Park
- State Fairgrounds
- Tennis and Basketball Courts
- Torrey Pines State Reserve
- Railroad
- Del Mar City Limits

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Del Mar Public Paths and Trails

Figure 22

courts are designated by the City as Public Parkland and are open to the public at no charge during daylight hours (the courts are not lighted for nighttime use). Water, restrooms, and parking are provided. The courts at their closest point are within 0.17 mile of the southernmost extent of the area identified for temporary impacts (potential restriping). They are just over 0.5 mile from the southernmost extent of bridge reconstruction. Residential uses and city streets intervene between the study corridor and the courts (City 2019b). The distance of the bridge reconstruction activities from the courts, combined with lack of visual access of any part of the project corridor, results in tennis court activities being unaffected by the footprint of potential construction activities.

State Fairgrounds

The State Fairgrounds, also referred to as the Del Mar Fairgrounds, are located just east of the project alignment and the NCTD rail bridge. The Fairgrounds comprise a regional assembly and entertainment destination that is the site of multiple large events held throughout the year that draw visitors from the San Diego and greater southern California region (Del Mar Fairgrounds 2022). Temporary impacts for proposed staging areas may occur within two areas of the State Fairgrounds, the practice track and surface parking areas at the western portion of the State Fairgrounds shown in Figure 7. If utilized for construction staging, these areas would revert to the previous use upon completion of the construction period. During project construction, access to, and use of, the State Fairgrounds would be maintained. No permanent impacts would occur.

Public Trails and Paths

Trails closest to the Camino Del Mar Bridge include the westerly segment of the River Path Del Mar along the San Dieguito Lagoon (City Path 20, extending from the east side of the Camino Del Mar Bridge eastward to the LOSSAN railroad), the easterly segment of the River Path Del Mar City Path 16 extending eastward from the east side of the railroad bridge along the San Dieguito Lagoon), and the Scripps Bluff Preserve path (City Path 17 located northwest of the bridge on the North Bluff and west of—and connecting to—Camino del Mar). The project would not result in a temporary or permanent use of the River Path Del Mar (Paths 16 and 20) or the Scripps Bluff Preserve path (Path 17). Path 20, the westerly segment of the River Path Del Mar, extends from the eastern edge of the existing Camino Del Mar Bridge to the LOSSAN railroad. Located on the south side of the lagoon, the trail area is specifically called out on project Site Preparation Plans as an area requiring maintenance of trail access during construction. Pedestrian access from the trail to the pedestrian crossing area over Camino del Mar would be maintained.

As summarized above, the project would not substantially impair activities, features, and attributes of parks and recreational facilities within the vicinity of the project. Physical impacts on parks are usually associated with population growth, which increases the demand for and use of parks; no population growth would occur from implementation of the project. While additional employees during construction are anticipated, they are not expected to use existing neighborhood or regional parks or other park facilities to a degree that would constitute the need for new or altered park facilities. Therefore, the proposed project would not result in an increased demand requiring the need for new or physically altered park facilities and related impacts would be less than significant.

e) Other public facilities?

No Impact. Following bridge replacement, buffered bike lanes and sidewalks would be provided on both sides of the bridge, improving the current facilities provided on Camino del Mar along with access to

existing community facilities within the project area. The proposed replacement of the Camino del Mar Bridge would occur almost entirely within the existing right-of-way. Apart from parks and recreational facilities discussed above, no community facilities are located within the immediate vicinity of the project site that would be adversely affected, either directly or indirectly, by the project. The closest libraries are located at 1309 Camino del Mar, approximately 0.8 mile south of the southernmost extent of the project boundary within Del Mar Village; and at 157 Stevens Avenue, approximately one mile north of the northernmost extent of the project boundary. As discussed above, physical impacts on public services are usually associated with population growth, which increases the demand for public services and facilities. The project would not increase the local population. While there may be a slight increase in demand for public services and facilities during construction due to the presence of construction workers, they are not expected to increase the use of existing public facilities such that new or expanded facilities are required or substantial adverse effects would occur from their use. Impacts would be less than significant.

XVI. Recreation

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	■	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	■	☐

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Less Than Significant Impact. Potential impacts associated with temporary and permanent use of facilities identified within a 0.5-mile radius of the project site are evaluated in XV.a(d), above. In addition to the temporary and permanent use impacts evaluated above, an increase in the use of existing parks and recreational facilities can also typically result from an increase in housing or population in an area. The project would not result in an increase in housing or residents in the project vicinity, nor would the project substantially impair activities, features, and attributes of parks and recreational facilities within the vicinity of the project. Therefore, impacts would be less than significant.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Less Than Significant Impact. Please refer to XVI.a. The project does not include recreational facilities or require the construction or expansion of existing recreational facilities. Impacts would be less than significant.

XVII. Transportation

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a)	Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☐	☐	■
b)	Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☐	■
c)	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	■	☐
d)	Result in inadequate emergency access?	☐	☐	■	☐

The following discussion is based on the Transportation Impact Analysis Report prepared by STC Traffic, Inc. (STC; 2018) included as Appendix J to this IS/MND.

Discussion

Camino del Mar is a primary transportation route through the City that supports vehicular, bus, bicycle, and pedestrian circulation. Camino del Mar is a north-south roadway along the coast that spans the lagoon via the bridge, provides connections to coastal destinations in the area, and serves as a local bypass of I-5 for motorists travelling along the coastline. Camino del Mar is classified as a Two-Lane Collector roadway with a daily capacity of 15,000 vehicles. Observed traffic volumes along Camino del Mar between Via de la Valle and Coast Boulevard included 12,540 vehicles on a single "average weekday" day in April 2018 (STC 2018; Appendix J). The roadway configuration of Camino del Mar on the existing bridge includes two 7.5-foot-wide bicycle lanes and two 15-foot-wide traffic lanes separated by a 7-foot-wide raised median landscaped with ornamental vegetation. Two-foot-wide guard railings occur at the outer edges of the bicycle lanes and a 5-foot-wide steel bracket pedestrian walkway exists along the western edge of the bridge.

NCTD operates the local transit service within the City, which is referred to locally as "The Breeze." NCTD currently operates two fixed bus services routes that provide access to and from the City, including Routes 101 and 308. NCTD's Route 101 serves bus stops along Camino del Mar and currently travels along the stretch of Camino del Mar between Via de la Valle and Jimmy Durante Boulevard. It provides daily service from Oceanside to the University Towne Center area in the City of San Diego. Service is provided Monday through Friday and on weekends and holidays. No service along Camino del Mar is provided between 10:00PM and 5:00AM. There are two bus stops on Highway 101 north of Via de la Valle. Along Camino del Mar, there are four bus stops, two on either side of the street between Via de la Valle and Coast Boulevard (NCTD 2021).

a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

No Impact. Plans, policies, and ordinances that pertain to transportation planning within the project area are contained in the following documents:

- Complete Streets Act of 2008 (AB 1358)
- Caltrans' Deputy Directive DD-64-R1 (Complete Streets – Integrating the Transportation System)
- SANDAG Regional Complete Streets Policy
- City of Del Mar Complete Streets Policy
- San Diego Forward: The Regional Plan
- Regional Transportation Improvement Program (RTIP)
- Riding to 2050: The San Diego Regional Bike Plan
- City of Del Mar Community Plan (General Plan)

Complete Streets are designed to provide convenient routes and a variety of transportation options while enabling safe access for motorists, transit users, pedestrians, and bicyclists of all ages and abilities. The federal Complete Streets Act of 2009 defines Complete Streets policies and directs state departments of transportation and metropolitan planning organizations to adopt such policies and apply them to federally funded transportation projects. State, regional, and local governments and organizations have also adopted related policies, including California's Complete Streets Act of 2008 (AB 1358), Caltrans' Deputy Directive DD-64-R1 (Complete Streets – Integrating the Transportation System), SANDAG's Regional Complete Streets Policy, and the City's Complete Streets Policy. San Diego Forward: The Regional Plan (SANDAG 2015) is a comprehensive plan adopted by SANDAG in October 2015 that integrates the Regional Transportation Plan, Sustainable Communities Strategy, and Regional Comprehensive Plan. The Regional Plan is built on an integrated set of public policies, strategies, and investments to maintain, manage, and improve the transportation system so that it meets the needs of the San Diego region through 2050. The 2021 RTIP is the program of proposed projects for major transportation improvements in the San Diego Region, which is consistent with San Diego Forward: The Regional Plan and incrementally implements the vision presented in that plan. Riding to 2050: The San Diego Regional Bicycle Plan, adopted by SANDAG in 2010, encourages the development of a unified bicycle system throughout the San Diego region to serve the needs of all bicycle riders by implementing efficient and feasible connections to local and regional activity centers, transit facilities, and regional trail systems. The City of Del Mar Community Plan (City of Del Mar 1976, as amended) is the City's General Plan, which sets forth the comprehensive long-term plan for the physical development of the City, and includes objectives relevant to the project within the Transportation category. Project consistency with each of the applicable plans, policies, and ordinances is summarized below.

Consistency with Complete Streets Policies of the U.S., California, Caltrans, and the City

In the current condition, pedestrian travel currently is limited to the westerly pedestrian walkway. The project proposes to provide two-way pedestrian and bicycle movement across the bridge. Safety would be enhanced through the separation of northbound and southbound traffic lanes and bike lanes by a buffer (striped), and separation of pedestrian sidewalks at the outer edges of the bridge from the bike lanes by bridge railings. Concrete curbs and metal hand railings are proposed to line the eastern and

western edges of the replacement bridge. These design features would be consistent with the applicable complete streets policies and directives in addressing the safety and mobility needs of bicyclists, pedestrians, transit users, and motorists.

Consistency with Regional Transportation Plans

The project is consistent with the overall intent of the San Diego Forward: The Regional Plan, as well as the applicable goals and policies identified in Riding to 2050: The San Diego Regional Bike Plan, because it proposes to implement transportation improvements that would enhance pedestrian and bicycle access. Because the project would improve multi-modal functionality of existing Camino del Mar roadway and connectivity within the project area, the project would be compatible with existing local land use plans and land use designations. The project is identified for funding in the 2021 RTIP and thus, would be consistent with this plan.

Consistency with City of Del Mar Community Plan (General Plan)

The project would be consistent with the relevant goals and objectives noted above in the City of Del Mar Community Plan (General Plan). The project would encourage pedestrian-oriented non-motorized modes of transportation through the provision of safe two-way pedestrian access and continued accommodation of bicycle movement across the bridge, which also would minimize air pollution. Pedestrian access to recreational areas, including beaches and cliffs, would be preserved throughout project construction and improved as part of project design. The NCTD bus route serving Camino del Mar between Via de la Valle and Jimmy Durante Boulevard would be maintained during construction and continue once bridge replacement has been completed. Accordingly, the project would be consistent with the relevant objectives of the City of Del Mar Community Plan (General Plan).

As demonstrated, the project would not conflict with a program plan, ordinance, or policy addressing the circulation system. No impact would occur.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

No Impact. CEQA Guidelines Section 15064.3, subdivision (b) provides criteria to evaluate a project's potential impact on transportation and traffic depending on the type of project. Section 15064.3(b) establishes vehicle miles traveled (VMT) as the appropriate measure for transportation impacts and eliminates automobile delay as appropriate for the determination of potentially significant transportation and traffic impacts. VMT is defined as a measurement of miles traveled by vehicles within a specified region and for a specified time period. For transportation projects that reduce or have no impact on VMT (meaning there is no increase in demand for additional trips to be generated), CEQA Guidelines Section 15064.3 suggests that these projects be concluded to cause a less than significant impact. According to the City's Guidelines for Transportation Impact Analysis updated June 1, 2020, roadway and mobility projects included in the Del Mar Community Plan (General Plan) are "screened out" with no VMT analysis required, as they are presumed to cause a less than significant impact on the environment associated with potentially significant levels of VMT (City 2020).

The project is included in the Del Mar Community Plan (General Plan), which identifies goals and policies associated with the redesign and replacement of the existing bridge. Moreover, VMT is not expected to increase during project construction, as continuous access would be allowed throughout construction aside from ~~12~~ 14 temporary night closures during which time a detour would be provided. During project construction, worker commutes and equipment hauling vehicles would be traveling to and from

the project site, causing an incremental increase in localized traffic; however, this would be temporary and would cease once construction is complete. Once operational, the bridge would provide local access to the areas of Del Mar and Solana Beach in the same capacity as the existing bridge. Based on these considerations, no impacts related to conflicts or inconsistencies with CEQA Guidelines Section 15064.3, subdivision (b) would occur.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less Than Significant Impact. The project would not cause hazardous geometric design features or incompatible uses. The project proposes to retain the same number of lanes and the overall roadway geometry would be similar to the existing bridge. Apart from the bridge segment of Camino del Mar proposed for replacement, no changes to intersection and roadway segment geometry or increase in vehicular capacity would occur. During construction of the replacement bridge, vehicular, bicycle, and pedestrian access would remain throughout all phases. During Phase 2 of the staged construction, vehicular and bicycle traffic would be routed to the western side of the bridge and share one lane in each direction while work is performed on the eastern side. The existing travel way in each direction is approximately 22 feet, which would accommodate two temporary 11-foot-wide travel lanes. The existing pedestrian walkway located on the west side of the existing bridge would be maintained. During Phase 3, traffic would be switched to the replacement bridge while the western half is constructed. Pedestrian traffic would be rerouted to the newly completed bridge on the east side. Signage would be installed at pedestrian crossings on either side of the bridge construction to facilitate safe pedestrian crossing. Bicyclists would share the road with vehicular traffic during Phases 2 and 3. Traffic would be rerouted a third time during Phase 4 in order to place the closure pour and complete the transitions and median in the roadway. A TCP would be required and the City would oversee its implementation so that roadway safety is maintained during construction. While the project would temporarily remove 56 parking spaces within the project corridor during construction and permanently remove 4 additional parking spaces following project completion, the project has been designed to minimize impacts to parking to the extent practicable. Permanent removal of parking would occur only where spaces would contain angles that preclude parking or would be located on pedestrian crosswalks (an incompatible use). The other 56 spaces temporarily affected during construction would be returned to use. Upon completion of construction, the project would result in improved connectivity and safety for vehicles, bicycles, and pedestrians. As a result, impacts associated with roadway hazards or incompatible uses would be less than significant.

d) Result in inadequate emergency access?

Less Than Significant Impact. The construction methodology proposed for the project would allow for nearly continuous vehicular, bicycle, and pedestrian access through the project site, with the exception of ~~12~~ 14 temporary night closures. A TCP would be implemented to identify temporary detours around the project site during the closures. Once constructed, no changes to existing circulation or emergency access would occur during operation of the replacement bridge. Impacts associated with emergency access would be less than significant.

XVIII. Tribal Cultural Resources

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☐	■	☐	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	■	☐	☐

The following discussion is based on the Archaeological Survey Report prepared by HELIX (HELIX 2022b) and included as Appendix C (Confidential) to this IS/MND.

a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

   i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?

   ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Less Than Significant with Mitigation Incorporated. As described in Section V, *Cultural Resources*, the NAHC was contacted to request a search of its Sacred Lands File and a list of Native American individuals and organizations that might have knowledge of, or concerns regarding, cultural resources within the project areas. The NAHC indicated in a response dated August 23, 2018, that, while the results of the

search were negative, the absence of site-specific information does not indicate an absence of cultural resources within a given area. Initial outreach letters were sent by HELIX to tribal representatives and interested parties identified by the NAHC on July 22, 2021. Five responses were received, as summarized in Table 12, *Native American Contact Program Responses*.

Table 12
NATIVE AMERICAN CONTACT PROGRAM RESPONSES

Contact/Tribe	Response
Agua Caliente Band of Cahuilla Indians	Responded by email on August 3, 2021; the project site is not within the Tribe's Traditional Use Area. Therefore, they defer to other tribes in the area.
Jamul Indian Village of California	Responded by email on September 27, 2021; there is a culturally sensitive area in close proximity to the project. They would like to receive any new information and the results of the field survey.
Rincon Band of Luiseño Indians	Responded by letter dated August 2, 2021; the project site is not located within the Rincon Band's specific Area of Historic Interest. They recommend contacting a Tribe that is closer to the project and may have pertinent information.
San Pasqual Band of Mission Indians	Responded by letter dated July 14, 2021; project is within the boundaries of the territory that the tribe considers its Traditional Use Area, and they would like to engage in formal consultation to be involved with developing the measures that will be taken to protect these sites and mitigate any adverse impacts.
Viejas Band of Kumeyaay Indians	Responded by email on August 3, 2021; project site has cultural significance or ties to Viejas and cultural resources have been located within or adjacent to the APE of the proposed project. Request that a Kumeyaay Cultural Monitor be on site for ground disturbing activities to inform the Tribe of any new developments, such as inadvertent discovery of cultural artifacts, cremation sites, or human remains.

Pursuant to Public Resources Code Section 21080.3.1 (AB 52), California Native American tribes traditionally and cultural affiliated with the project area can request notification of projects in their traditional cultural territory. Consultation notification letters were sent by City staff to tribal representatives on September 28, 2021. Two responses were received from the San Pasqual Band of Mission Indians, dated November 3, 2021 and December 15, 2021. The response letters indicated that the project is located within the boundaries of the territory that the tribe considers its Traditional Use Area, and they would like to engage in consultation with the City to be involved in the development of the measures taken to mitigate potential temporary and permanent adverse impacts to the Traditional Use Area due to the project construction. The City has been in consultation with the San Pasqual Band of Mission Indians for their review of cultural resources mitigation measures and project components developed to reduce impacts to their Traditional Use Area. All cultural reports and surveys related to the project have been shared with the San Pasqual Band of Mission Indians' representatives. Input received during consultation has been incorporated into the analysis within this IS/MND, as well as mitigation measure CUL-1. No additional requests for consultation pursuant to AB 52 have been made.

Due to the sensitivity of the project vicinity and the potential for buried cultural resources, project construction would have the potential to result in a significant impact to a tribal cultural resource. However, these potential impacts would be reduced to a less than significant level with the implementation of mitigation measure CUL-1, as discussed in V.b. of this IS/MND.

XIX. Utilities and Service Systems

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	■	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	■	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	■
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	■	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	■	☐

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less Than Significant Impact. A total of nine existing utility conduits (pipes) have been identified within the existing bridge, two of which have been abandoned. They include one conduit for lifeguard communication (abandoned); one conduit for telecommunications; one 12-inch-diameter sewer force main; one 6-inch-diameter PVC recycled water line; two high-pressure natural gas lines (4-inch-diameter and 12-inch-diameter lines hung from the western and eastern sides of the bridge, respectively) operated by SDG&E and Southern California Edison, respectively; two 4-inch-diameter high-pressure iron pipe lines; and one 4-inch-diameter PVC pipe line (abandoned). These utilities would be temporarily relocated to the temporary work trestle during construction and installed on the replacement bridge during Stages 2 and 3. At least two spare 4-inch-diameter PVC conduits for future use would be provided per Caltrans bridge design standards.

As a bridge replacement project that would not generate additional population, no supporting utility infrastructure related to new or expanded water, wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications facilities would be required. Potential impacts resulting from the temporary relocation of existing utilities are included in the overall bridge construction impacts evaluated in this IS/MND. Portable toilet(s) may be provided for use during the construction period;

waste generated by use of the portable toilets would be hauled away and disposed of at an approved facility in accordance with solid waste laws. Therefore, impacts associated with relocation or construction of new or expanded utilities would be less than significant.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Less Than Significant Impact. The project proposes the replacement of an existing bridge, which would not create a significant demand for water supplies. A negligible, short-term increase in demand for water during construction, including associated with the on-site restoration/re-establishment of native habitat proposed to address potentially significant impacts to sensitive vegetation communities, would occur. These areas would be irrigated until the vegetation is established, which can take three to five years. The temporary nature of the required water service and the relatively minor amount required for irrigation purposes would not create a considerable demand for water or new water services particularly since water lines are present within the vicinity of the project. Therefore, impacts would be less than significant.

c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact. The project would not generate wastewater or require the need for wastewater services or treatment. Therefore, the project would not result in inadequate capacity for the existing wastewater treatment provider and no impact would occur.

d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less Than Significant Impact. Project construction and demolition activities would generate solid waste. To replace the bridge, the existing foundations and superstructure must be removed, as well as existing trees and vegetation and concrete and asphalt medians. The tree and vegetation trimmings would be hauled off site to a green waste facility. The existing wood piles supporting the bridge would be removed to at least one foot below the general scour depth or entirely removed if they conflict with the proposed foundations of the replacement bridge. Existing abutments would be retained in place to avoid the effort and expense required to remove riprap, install cofferdams, excavate to abutment pile caps, demolish the existing abutment structures, remove piles, dewater, etc. The construction contractor would be responsible for removal of demolition and construction materials from the site, and would be required to comply with federal, state, and local statutes and regulations related to solid waste reduction, including waste management, reduction, and recycling of demolition and construction debris and waste. Such waste would be source separated on-site for reuse, recycling, or proper disposal. For construction waste that cannot be diverted or recycled, such as material packaging and food-related trash generated by employees, landfills in the region would have adequate capacity to fulfill the project's solid waste generation needs. Hazardous materials discussed in IX.a and IX.b of this IS/MND would be properly disposed of pursuant to mitigation measures HAZ-1 through HAZ-3. Provisions would be included in the construction bid documents to ensure the proper removal and disposal of hazardous materials, such as treated wood waste material found on the existing bridge. The project is not likely to generate solid waste in amounts that would adversely affect the existing capacity of regional landfills.

Once operational, the project would not generate waste. Therefore, impacts would be less than significant.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Less Than Significant Impact. As described above in XIX.d, the project would not generate excessive solid waste and would comply with all waste management and reduction statutes and regulations. Solid waste generated by the project would be collected and transported to an appropriate recycling, disposal, or processing facility that is properly equipped and capable of handling solid waste materials as required by City and Caltrans standards. Therefore, potential impacts related to compliance with applicable solid waste regulations would be less than significant.

XX. Wildfire

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	■	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	■	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	■	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	■	☐

Discussion

The project area is located within a Local Responsible area according to the maps prepared under the CAL FIRE and Resource Assessment Program (CAL FIRE 2020). The project is not located in a very high fire hazard severity zone (VHFHSZ); the closest area mapped as VHFHSZ is approximately 0.6 mile southeast of the project site along San Dieguito Drive in the southeastern portion of the City. According to the City's Urban Forest Management and Fire Safety Strategic Plan, the objective of the City's fire safety planning is to "make a continuous effort to reduce the fuel load and heighten public understanding of the relationship between vegetation, local topography, fire behavior and 'defensible space'" (City 1999).

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. The County of San Diego Emergency Operations Plan, Annex Q: Evacuation, was last updated in September 2018 and identifies I-5 as the primary regional evacuation route for San Diego County and Jimmy Durante Boulevard as a primary evacuation route for the City (County 2018). Jimmy Durante Boulevard connects the City to I-5 by way of Via de la Valle, north of the project site. Construction of the project would occur along Camino del Mar over a ~~27~~36-month period, during which time a total of ~~12~~ 14 temporary night closures of the bridge would be required. During the nighttime full bridge closures, vehicles would be temporarily detoured along Via de la Valle and Jimmy Durante Boulevard to allow continuous vehicle access within the project area. Advanced notice detour signage would be installed along Camino Del Mar and east of the intersection of Jimmy Durante Boulevard and Via de la Valle to notify roadway users of the detour. Maintaining access to Jimmy Durante Boulevard and I-5 during project construction would ensure that impacts related to the substantial impairment of the adopted County of San Diego Operations Plan, Annex Q: Evacuation would be less than significant.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Less Than Significant Impact. The City is subject to both wildland and urban fires due to its climate, topography, and native vegetation. The extended droughts characteristic of the region's Mediterranean climate and increasingly severe dry periods associated with global warming result in large areas of dry native vegetation that provide fuel for wildland fires. State law requires that all local jurisdictions identify VHFHSZs within their areas of responsibility (California Government Code Sections 51175–51189). Inclusion within these zones is based on vegetation density, slope severity, and other relevant factors that contribute to fire severity. The project site is not located within a state responsibility area. The project would not contribute to the exacerbation of fire risk as it would not result in additional long-term traffic and would not include habitable structures or other development that would exacerbate wildfire risk or exposure. As a result, project implementation would not exacerbate wildlife risk, and impacts would be less than significant.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Less Than Significant Impact. The project proposes to replace the existing Camino del Mar Bridge. No infrastructure is proposed that may exacerbate fire risk or result in temporary or ongoing impacts to the environment. Impacts would be less than significant.

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Less Than Significant Impact. The project would not result in the addition of people or structures; therefore, project implementation would not increase exposure to risks associated with post-fire slope instability or drainage changes. Impacts would be less than significant.

XXI. Mandatory Findings of Significance

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☐
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present and probable future projects)?	☐	☐	☐	☐
c)	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☐

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less Than Significant with Mitigation Incorporated. As described under IS/MND Section IV, *Biological Resources*, and Section V, *Cultural Resources*, the proposed project has the potential to impact wildlife and California prehistory; however, impacts would be reduced to less than significant with the incorporation of mitigation measures. Specifically, the project has the potential to result in significant impacts on special status plant and animal species. Special status plant species identified within the study area include Torrey pine, woolly seablite, southwestern spiny rush, and red sand-verbena. One special-status animal species has been identified within the study area, Belding's savannah sparrow. Potential impacts to migratory birds, temporary and permanent impacts to vegetation communities (i.e., Diegan coastal sage scrub, beach, and open water), and potential wetland waters of the U.S./State were identified. Potential impacts on major periods of California prehistory were identified due to the sensitivity of the project vicinity and the potential for buried cultural resources to be present within the project footprint. These impacts to biological and cultural resources were determined to be less than significant with incorporation of mitigation measures BIO-1 though BIO-6 and mitigation measure CUL-1, respectively. Similarly, impacts related to the potential for the project to substantially degrade the quality of the environment would be reduced through the implementation of mitigation measures. Impacts would be reduced to less than significant.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present and probable future projects)?

Less Than Significant with Mitigation Incorporated. The analysis below discusses the project's potential to make a cumulatively considerable contribution to an environmental impact, by resource. Where it has been determined based on the analysis in this IS/MND that no impact would occur or a less-than-significant impact would occur in relation to specific resources (i.e., agriculture and forestry resources, air quality, energy, GHG emissions, hydrology and water quality, land use and planning, mineral resources, population and housing, public services, recreation, transportation, utilities and service systems, and wildfire), the project would inherently not result in a cumulatively considerable impact relative to those resources and no further discussion is provided below. As described in this IS/MND, the project would incrementally contribute to potentially significant environmental impacts related to aesthetics, biological resources, cultural resources, geology and soils (paleontological resources), hazards and hazardous materials, noise, and tribal cultural resources. The mitigation measures that would be implemented related to these environmental resources would reduce these impacts to a less-than-significant level.

Cumulative Projects

The project area is generally built out on lands available for development, or in open space set aside in perpetuity or state lands. Although it is possible that existing conditions could continue, two likely projects include the San Dieguito River Bridge Replacement, Double Track, and Del Mar Fairgrounds Special Events Platform project (San Dieguito River Bridge Replacement); and development on the North Bluff (private parcels located atop the bluff northwest of the bridge and north of the Scripps Bluff Preserve. The respective properties on the North Bluff are currently designated and zoned for low density and very low density housing and are also identified as a contingency plan in the 6th Cycle Housing Element to provide future multiple dwelling unit housing capacity in case the City is unable to timely implement its preferred State Fairgrounds housing program by December 2024. At this point, evaluation of future land use scenarios and potential impacts on the North Bluff is considered speculative and is not discussed further relative to potential cumulative impacts. Future development on the North Bluff would be subject to permit review and compliance with the policies and regulations of the City's certified LCP and compliance with the environmental review and processing requirements in accordance with CEQA or equivalent level of environmental review pursuant to the Coastal Act.

The San Dieguito Rail Bridge Replacement project proposes to construct rail improvements within portions of the cities of Solana Beach and Del Mar and provide a direct passenger connection to the Del Mar Fairgrounds. The project extends approximately 2.1 miles along the LOSSAN rail corridor between the rail undercrossing at Lomas Santa Fe Drive to just north of Coast Boulevard, approximately 500 feet east of the project site between Camino del Mar and the State Fairgrounds. Proposed rail improvements include: (1) construction of new double track bridge structures over the San Dieguito River; (2) 2.1 miles of track improvements, including the addition of 1.7 miles of new double track; (3) a special events rail platform at the Del Mar Fairgrounds; and (4) other rail improvements and modifications within the project limits plus a new signal line that would extend south of CP Del Mar to reconnect an existing signal house just south of Coast Boulevard. Construction would be completed in several phases over a total duration of approximately three years, with some overlap between phases. Rail services would remain operational during all phases of construction and would be rerouted between the existing and

new track as it is built. Construction of the new bridge over the San Dieguito River would involve removing the existing trestle bridge, which would be done from atop the trestle bridge itself. Demolition would start at one end and proceed to the other, removing one span and bent at a time. A Draft Environmental Assessment (EA) was circulated for public review in October 2014 by the Federal Transit Authority (FTA) as the NEPA lead agency, which evaluated the potential impacts resulting from implementation of that project, including evaluation of three potential build alternatives. The results and conclusions of the EA are summarized for each of the resource areas discussed below.

Cumulative Impact Evaluation

Aesthetics. As discussed in Section I, potentially significant visual effects evaluated for the project relate to the removal of seven trees within the road right-of-way in accordance with DMMC Chapter 23.50 (Trees). This impact would be addressed through use of existing credits from the City's Public Tree/Landscape Management program that is administered by the City of Del Mar Public Works Department. No vegetation or tree removal was discussed relative to potential visual affects assessed for the San Dieguito Rail Bridge Replacement project; therefore, the project impact associated with tree removal would be less than cumulatively considerable.

Based on a 2014 VIA prepared for the San Dieguito Rail Bridge Replacement project, primary visual elements of proposed double-tracking would result in an additional 1.7 miles of track that may be eight feet higher in places than the existing trestle bridge and would be lighter in color. Two new single-track bridge structures would replace the existing single track trestle bridge. "Special events" platform(s) a minimum of 16 feet in width and 1,000 feet in length would be included. The bridge structures also would have wider spaced (and parallel) concrete supports. These new features, in combination with the proposed project, would cause incrementally more visual change in the viewshed than the project would alone. Overall, however, implementation of both of these bridge replacement projects would not be expected to result in substantial adverse change for viewers in the vicinity of Camino del Mar, given the existing developed visual environment and the similarity between existing and proposed views. When located within a single view, the general consistency of the improvements in terms of color and scale, as well as the greater openness provided by both bridges, are expected to balance additional height of both bridges. Cumulative changes would be expected to be neutral overall rather than either detrimental or beneficial. Views and viewer response to the project would be similar to the existing condition since land uses and facility types would not substantially change. Therefore, the project's contribution to visual change within the viewshed would not be cumulatively considerable.

Biological Resources. Section IV of this IS/MND identified potentially significant impacts to biological resources resulting from construction of the proposed project, including indirect impacts to one special status species (Belding's savannah sparrow) and other nesting birds that may be present within the vicinity of the project; temporary impacts to 0.02 acre of Diegan coastal sage scrub; permanent impacts to 0.16 acre of Diegan coastal sage scrub (including 0.02 acre disturbed); and temporary impacts to ~~1.90~~ 1.89 acres and ~~0.31~~ 0.33 acre of permanent impacts to potential USACE, RWQCB, CDFW, and CCC jurisdictional areas. Implementation of mitigation measures BIO-1 through BIO-3 would ensure that potential impacts to Belding's savannah sparrow and other birds protected under the MBTA and California Fish and Game Code are avoided during construction. A conceptual mitigation plan would be prepared for the project to address temporary and permanent impacts to Diegan coastal sage scrub (BIO-4). Native habitat that is subject to temporary impacts (i.e., 0.02 acre of Diegan coastal sage scrub, 0.61 acre of open water, and 1.29 acres of beach) would be restored to its previous state or better (biologically equivalent or superior in function and service). Temporary impacts to jurisdictional areas

would be mitigated through implementation of a conceptual wetland mitigation plan that identifies no net loss of wetlands through a minimum 1:1 establishment/creation on-site or at an approved off-site location, prepared in consultation with the regulatory agencies (BIO-5).

The San Dieguito Rail Bridge Replacement project EA identified permanent impacts to up to 2.58 acres of sensitive upland habitats and associated species (although no federally listed or endangered species were identified). Implementation of the avoidance, minimization, and mitigation measures would reduce these impacts to less than significant. Additionally, potential impacts to up to 0.86 acre of potential USACE jurisdictional areas and up to 1.34 acres of potential CCC jurisdictional areas also were identified. Compensatory mitigation via a combination of off-site enhancement, preservation, and/or establishment was proposed such that no net loss of wetlands would occur. Therefore, project would not incrementally contribute to substantial cumulative impacts associated with the loss of habitat or sensitive vegetation communities region wide and impacts would be less than significant.

Cultural and Tribal Cultural Resources. As discussed in Section V, while no significant cultural resources have been identified within the APE, there are numerous and important cultural resources that have been identified in the project vicinity and there is potential for buried cultural resources and/or human remains to be present within the project footprint. Per mitigation measure CUL-1, a cultural resources monitoring program would be conducted during project construction to ensure that an archaeologist and Kumeyaay Native American monitor would be on site during ground disturbance. If previously unidentified cultural materials are unearthed during project construction activities, mitigation measure CUL-1 would require ground disturbing activities to be temporarily halted or redirected until the cultural material is documented and assessed for significance. Similarly, the San Dieguito River Bridge Replacement EA has identified mitigation to address potentially impacts to cultural resources, including construction worker training and on-site monitoring if sites are suspected of containing cultural materials or human remains. Accordingly, impacts to cultural resources and tribal cultural resources would be less than cumulatively considerable with incorporation of mitigation measures during construction.

Geology and Soils. Based on the noted geologic and topographic information, there is a potential that unique paleontological resources may be discovered during ground disturbing activities for the proposed project, as well as the San Dieguito River Bridge Replacement project. All potential impacts to paleontological resources associated with the two projects would be effectively avoided or addressed through identified avoidance and minimization measures (GEO-1 and GEO-2). The importance of individual paleontological resources is related to the inherent scientific data and associated research value. Information gained from implementation of paleontological monitoring would be presented in reports and filed with appropriate regulatory agencies and scientific institutions with permanent paleontological collections, such as the San Diego Natural History Museum, as applicable. Fossils collected during grading activities associated with the two projects would be curated at such a scientific institution and would be available to other paleontologists for further study. Based on the required compliance with monitoring, collection, and analysis requirements for paleontological resources, potentially significant project impacts to paleontological resources would be less than cumulatively considerable.

Hazards and Hazardous Materials. As discussed in Section IX, potentially significant impacts associated with release of hazardous materials during demolition of the existing bridge were identified relative to PCB-containing oils present in pole-mounted transformers, ACMs, and LBP. Completion of sampling and adherence to Caltrans' Standard Special Provisions, as well as implementation of mitigation measures

HAZ-1 through HAZ-3, would ensure that construction activities would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of these hazardous materials into the environment. Similarly, impacts to hazardous waste/materials associated with the San Dieguito River Bridge Replacement project would be reduced through conformance with applicable regulatory requirements and implementation of appropriate avoidance, minimization, and mitigation measures. As a result, potentially significant impacts related to the increased exposure of people to public health and safety risks from hazardous materials would be less than cumulatively considerable.

Noise. As discussed in Section XII, noise associated with project construction would primarily affect the residential land uses adjacent to the bridge. Construction schedules and activities for the project and the San Dieguito River Bridge Replacement project are currently unknown; therefore, potential construction noise impacts associated with simultaneous projects are speculative; however, although multiple construction activities may occur simultaneously at the project site and LOSSAN rail site, given the distance between the two projects (500 feet) and the affected residences, as well as the noise attenuation created by intervening structures and other variables such as atmospheric absorption, the additional contribution to the ambient noise level would not be significant. Construction of the rail bridges and special events platform would generate noise and vibration at or above levels (daytime) established by the FTA as being likely to cause an adverse community reaction. Nighttime construction activities associated construction of double track could result in adverse impacts to residences along the project limits. These adverse impacts would not be substantial. Although not required to avoid a substantial impact, potential general noise reduction strategies for construction noise impacts were recommended, including temporary construction noise barriers between noisy activities and residential uses, avoiding nighttime construction when feasible, monitoring noise equipment levels, and minimizing the use of generators. Rail operations would generate noise level increases at some residences along the railroad tracks of approximately 1 dBA. This increase would not result in a substantial impact, nor would it affect the same residences that may also experience increased noise levels resulting from the proposed project. Therefore, impacts associated with noise and vibration would not be cumulatively considerable.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant Impact. The proposed project would cause an increase in ambient noise levels during construction; however, impacts would be temporary and less than significant with implementation of mitigation measure NOI-1. Per mitigation measure NOI-2, a noise barrier is proposed to reduce the noise levels experienced at the two sensitive receptors for which operational noise levels would approach the applicable thresholds for acceptable noise levels, reducing potential impacts to less than significant. The temporarily increased noise levels would not cause substantial adverse impacts on human beings due to distance from sensitive human receptors (i.e., residences) and implementation of the Construction Noise Management Plan. As a result, the project is not anticipated to have a substantial adverse effect on human beings, either indirectly or directly, and impacts would remain less than significant.

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4.0 Preparers

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Appendix A

Air Quality and Greenhouse Gas Emissions Assessment Letter

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September 10, 2021 01391.00002.002

Mr. Don Bloodworth
Kleinfelder
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San Diego, CA 92101

Subject: Air Quality and Greenhouse Gas Emissions Assessment for the Camino Del Mar Bridge Replacement Project

Dear Mr. Bloodworth:

HELIX Environmental Planning, Inc. (HELIX) has assessed air quality and greenhouse gas emissions impacts associated with the Camino del Mar Bridge Replacement Project (project). This letter summarizes the findings of the assessment.

The project has been determined to be exempt from Clean Air Act (CAA) transportation conformity analysis per CFR 93.126, Safety. Therefore, this analysis only addresses impacts related to the air quality ad GHG emissions impacts under the California Environmental Quality Act.

PROJECT BACKGROUND

The proposed Camino Del Mar Bridge Replacement Project (proposed project) involves the replacement of the existing Camino del Mar Bridge No. 57C-0209 (bridge), which crosses the San Dieguito Lagoon (lagoon) in the City of Del Mar (Del Mar or City). The bridge was determined in 2010 to be eligible for rehabilitation funding under the Highway Bridge Program but was later determined to be structurally deficient upon preparation of a Final Rehabilitation Strategy Report in 2012. As a result, bridge replacement was recommended. Caltrans is the federal lead agency under the National Environmental Policy Act (NEPA) providing local assistance to the City.

PROJECT LOCATION

The project site includes the existing bridge along Camino del Mar over the lagoon and areas immediately surrounding the bridge in the northwestern part of the City. Regional access to the project is provided from Interstate 5 (I-5), which runs parallel to the bridge about one mile to the east. The bridge serves as an important north-south connection for coastal residents and visitors in the vicinity and the greater San Diego region and is frequently used by motorists, bicyclists, hikers, and pedestrians.

The bridge is situated between the State Fairgrounds and the Pacific Ocean near coastal destinations and provides access to local beaches, open space areas, hiking trails, the Del Mar Village (the City's central business district), and Torrey Pines State Beach. The Camino del Mar roadway becomes Highway 101 north of Via de la Valle within the City of Solana Beach, about one-quarter mile north of the bridge. See Figure 1, *Regional Location* and Figure 2, *Project Location*.

PROJECT DESCRIPTION

The proposed project involves the replacement of the Camino del Mar bridge to continue providing vehicle, pedestrian, and bicycle movement along Camino del Mar as it crosses the lagoon and to continue to provide coastal access to Del Mar Beach, including Dog Beach. The proposed bridge design consists of a five-span cast-in-place prestressed concrete box girder bridge with variable depth bridge with a length of 624 feet (') between abutments, a width of 68.5', and an area of about 41,800 square feet (sf; 0.96 acre).

In comparison to the existing bridge, the replacement bridge would be located along the same horizontal alignment, would be slightly longer, wider, and higher, and would result in a reduction in the number of piers in the lagoon. The proposed additional 28'-2" in bridge length and additional 7.7' in bridge height near the center of the bridge would accommodate a mid-range sea level rise scenario of 38 inches[1] by the year 2100 during a 100-year flood while maintaining safe roadway design and avoiding roadway conflicts with driveways and coastal access points. The additional bridge width of 7'-5" would accommodate two-way pedestrian and bicycle movement across the bridge. The roadway approach zones within Camino del Mar would also require modifications to accommodate the raised elevation of the bridge, including reconstructing the sidewalks to meet the proposed pedestrian sidewalks on both sides of the replacement bridge. There would be no change in vehicle capacity as the existing two-lane Camino del Mar roadway would continue to provide two vehicle traffic lanes.

PROJECT CONSTRUCTION

The project is estimated to be constructed over 27 months during 5 distinct construction stages: Stage 1 – Site Preparation; Stage 2 – Replace East Side; Stage 3 – Replace West Side; Stage 4 – Close Bridge Median; and Stage 5, Final Improvements. The contractor will maintain continuous vehicular and pedestrian access (to the maximum extent feasible) along the Camino del Mar bridge throughout construction. Pedestrian coastal (beach) access at four existing coastal access points near the bridge would also be maintained throughout the duration of construction.

Travel lanes along Camino del Mar, including vehicle, pedestrian, and bicycle lanes, would be shifted from one side to the other, as the bridge is replaced. Bridge demolition and replacement would occur at one half of the bridge at a time, beginning with the east side (lagoon side) followed by the west side (ocean side). During the demolition and replacement of each side of the bridge, the opposite side would be used to re-route both lanes of traffic. Details for each of the construction stages are further described below. See Figure 3, *Construction Work Area*.

[1] Per the National Research Council's *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, Future, 2012*.

Stage 1 – Site Preparation

Stage 1 of construction would involve preparing the site for construction over an estimated two-month period starting in June 2024. Initiation of Stage 1 may involve up to four nights of roadway closures to prepare the bridge site for replacement. Construction activities associated with site preparation would involve the following: installing erosion control measures; preparing the beach level for temporary work trestle (trestle) installation; relocating the pedestrian crosswalks across Camino del Mar away from the abutments; removing the raised concrete median and vegetation/trees within and along the Camino del Mar roadway near the bridge. Erosion control measures would consist of installing straw rolls, gravel bag check dams, and silt fences around work areas. Drainage inlets along Camino del Mar would be protected with gravel bags and silt blankets. The City's water line within the bridge would either be capped and suspended during construction or temporarily relocated (i.e., "high-lined") onto the temporary work trestle and then reinstalled within Camino del Mar Bridge during Stage 4. Other active utilities beneath the bridge would remain in service and would be relocated onto the trestle during construction. Stage 1 would also involve preparation of the beach areas on both sides of the bridge, which would involve establishing construction contractor fencing, installing a covered pedestrian boardwalk (southwest corner) to provide residents and visitors with access to Del Mar Beach, and displaying signage that directs coastal visitors to coastal amenities in the area, including the beach and the City's River Path Del Mar.

Stage 2 – East-side Bridge Replacement

The second stage of construction would involve replacing the eastern half of the bridge on the lagoon side over an estimated 10-month period following site preparation, starting in August 2024. As the western half of the bridge would remain open to vehicle traffic, a temporary work trestle would be constructed to allow construction equipment to access and replace the east side of the bridge. As traffic is re-routed to the west side, a temporary K-rail would be bolted to the middle of the existing bridge deck and bracing would be installed to support the edge of the continuous traffic lane during bridge replacement in Stage 2.

A 50-foot-wide temporary trestle would be constructed at a similar elevation to the existing bridge deck and would connect to the existing abutments that would remain in place. Construction staging for the trestle, including the number of temporary piles, would be determined by the contractor; however, the estimated number of piles is approximately 125 to 150 per side for a total of 150 to 300 temporary piles to support the trestle. Piles would be installed by a variety of methods including, pile driving, oscillation or vibration, and/or helical screw driving.

Once the temporary work trestle is constructed, a netting system (or equivalent) would be installed on the trestle and existing bridge piers to prevent debris from falling into the lagoon and beach areas during demolition. Utilities under the bridge would be temporarily relocated onto the trestle and may remain in service depending on utility owner's disposition. The City's water utility line would be capped during construction.

Next, a steel sheet-pile cofferdam would be installed around each existing bridge pier to remove sand and water surrounding the piers. The height of the cofferdam would extend above the high tide line to prohibit water infiltration into the work area. Water within the cofferdam would be pumped above the walls and returned to the lagoon. Sand removal within the cofferdam at the piers would encounter

ocean water and dewatering activities would occur to create a dry work area. The excavated sand slurry would be stored would be stored temporarily during pier removal and reused in the original location or spread around the new bridge, as needed.

Once the cofferdam is in place, the eastern side of the bridge would be demolished, including the bridge deck, piers, columns, and piles. Bridge demolition on the east side would involve the use of crawler and lifting cranes, concrete breakers, and jackhammers that would work from the trestle hoisting chunks of sawcut concrete into hauling trucks for removal.

Bridge construction would involve repositioning individual cofferdams to accommodate the new bridge pier widths. For installation of new piles (which may be up to 200 feet deep and anchored into strong material), cofferdams would be positioned and drilling mud used to extract and remove excavated sand material. The excavated sand slurry would be stored in tanks within the construction area and removed as needed; due to the presence of oily particles used for the hydraulic pumping operation in the slurry mixture, it would be unsuitable for return to the ocean and would be removed for suitable disposal. The eastern half of the bridge superstructure and deck would then be formed and constructed, and the relocated utilities would be installed into the east side of the bridge prior to trestle removal. Both lanes of traffic and the pedestrian access would be re-routed from the west side to the newly constructed east side of the bridge in preparation for Stage 3. The temporary trestle would also be disassembled and re-assembled on the west side of the bridge to support construction of Stage 3.

Stage 3 – West-side Bridge Replacement

Stage 3 of construction would involve replacing the western half of the bridge on the ocean side over an estimated 10-month period following the replacement of the eastern side of the bridge, starting in June 2025. Traffic would be relocated to the newly completed eastern side of the bridge. Similar to the description for Stage 2, construction of a temporary trestle, repositioning of individual cofferdams to accommodate the new piers, temporary relocation of utilities, removal of the western side of the bridge, and construction of the bridge using similar construction equipment as Stage 2. Sand reuse/ removal and cofferdam dewatering would occur similar to Stage 2. Relocated utilities on the trestle would be installed into the west side of the Camino del Mar bridge and roadway prior to trestle removal.

Stage 4 – Bridge Median Improvements

Once the two halves of the bridge are constructed in Stages 2 and 3, a four-foot-wide closure pour would occur in the center of the bridge, connecting the two sides of the bridge and creating the new median and area for utility lines. Stage 4 would require the use of concrete trucks and pumps, delivery trucks, tool trucks, worker trucks, hauling trucks, and power tools over an approximate two-month period starting in April 2026.

Stage 5 – Final Improvements

Stage 5 would consist of final contour grading and street improvements in Camino del Mar over an approximate three-month period starting in June 2026. Stage 5 would include signage installation, striping on the pavement, water line installation, and the final installation of water quality devices to treat and discharge road runoff during storm events. Finally, construction equipment and debris would

be removed at the end of the construction period. Construction equipment would consist of hauling and worker trucks, including contractor de-mobilization.

CLIMATE AND METEOROLOGY

Climate and meteorology affect the dispersion and chemical reaction of air pollutants, and the resulting concentrations of pollutants, both locally at the project site and in the region. The climate in southern California, including the San Diego Air Basin (SDAB), is controlled largely by the large-scale meteorological condition that dominates the west coast of the Undated States: a seasonally semi-permanent high-pressure cell centered over the northeastern Pacific Ocean, called the Pacific high, which keeps most storms from affecting the California coast. Areas within 30 miles of the coast in the San Diego region, including the Program facility sites, experience moderate temperatures and comfortable humidity.

Temperature inversion layers (inversions; layers of warmer air over colder air) affect air quality conditions significantly because they influence the mixing depth (i.e., the vertical depth in the atmosphere available for diluting air contaminants near the ground). The highest air pollutant concentrations in the SDAB generally occur during inversions. During the summer, air quality problems in the SDAB are created due to the interaction between the ocean surface and the lower layer of the atmosphere, creating a moist marine layer. An upper layer of warm air mass forms over the cool marine layer, preventing air pollutants from dispersing upward. Additionally, hydrocarbons and oxides of nitrogen (NO_X) react under the strong, abundant sunlight in the San Diego region, creating smog. Light, daytime winds, predominantly from the west, further aggravate the condition by driving the air pollutants inland, toward the foothills. During the fall and winter, air quality problems are created due to carbon monoxide (CO) and NO_X emissions. High NO_X levels usually occur during autumn or winter, on days with summer-like conditions.

AIR QUALITY REGULATORY FRAMEWORK

Criteria Pollutants

Ambient air quality is described in terms of compliance with state and national standards, and the levels of air pollutant concentrations considered safe, to protect the public health and welfare. These standards are designed to protect people most sensitive to respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. The U.S. Environmental Protection Agency (USEPA), the federal agency that administrates the Federal Clean Air Act of 1970, as amended in 1990, has established national ambient air quality standards (NAAQS) for several air pollution constituents known as criteria pollutants, including: ozone (O_3); CO; coarse particulate matter (PM_{10}; particles 10 microns or less) and fine particulate matter ($PM_{2.5}$; particles 2.5 microns or less); sulfur dioxide (SO_2); and lead (Pb). As permitted by the Clean Air Act, California has adopted the more stringent California ambient air quality standards (CAAQS) and expanded the number of regulated air constituents. Ground-level ozone is not emitted directly into the environment but is generated from complex chemical and photochemical reactions between precursor pollutants, primarily reactive organic gases (ROGs; also known as volatile organic

compounds [VOCs]),[2] and NO_X. PM_{10} and $PM_{2.5}$ are generated from a variety of sources, including road dust, diesel exhaust, fuel combustion, tire and brake wear, and windblown dust. In addition, PM_{10} and $PM_{2.5}$ can also be formed through chemical and photochemical reactions of precursor pollutants in the atmosphere.

Areas that do not meet the NAAQS or CAAQS for a particular pollutant are considered to be "nonattainment areas" for that pollutant. The air quality attainment status of the SDAB is shown in Table 1, *San Diego Air Basin Attainment Status*. Effective July 2, 2021, the SDAB was classified as a severe nonattainment area for the 8-hour NAAQS for ozone (USEPA 2021a). The SDAB is a nonattainment area for the 1-hour ozone, 8-hour ozone, PM_{10}, and $PM_{2.5}$ CAAQS. The SDAB is an attainment area or unclassified for all other criteria pollutants (San Diego Air Pollution Control District [SDAPCD] 2020a).

Table 1
SAN DIEGO AIR BASIN ATTAINMENT STATUS

Pollutant	Federal Attainment Status	State of California Attainment Status
Ozone (1-hour)	(No federal standard)	Nonattainment
Ozone (8-hour)	Nonattainment	Nonattainment
Coarse Particulate Matter (PM_{10})	Unclassifiable[1]	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Attainment	Nonattainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Lead	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Sulfates	No Federal Standard	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Visibility Reducing Particles	No Federal Standard	Unclassified

Sources: SDAPCD 2020a

[1] At the time of designation, if the available data does not support a designation of attainment or nonattainment, the area is designated as unclassifiable.

Attainment Plan

The SDAPCD and San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The regional air quality plan for the County is SDAPCD's 2020 Plan for Attaining the National Ambient Air Quality Standards for Ozone in San Diego County (Attainment Plan; SDAPCD 2020b). The Attainment Plan, which would be a revision to the SIP, outlines SDAPCD's plans and control measures designed to attain the NAAQS for ozone. These plans accommodate emissions from all sources, including natural sources, through implementation of control measures, where feasible, on stationary sources to attain the standards. Mobile sources are regulated by the USEPA and CARB, and the

[2] The California Air Resources Board (CARB) defines and uses the term ROGs while the U.S. Environmental Protection Agency (USEPA) defines and uses the term VOCs. The compounds included in the lists of ROGs and VOCs and the methods of calculation are slightly different. However, for the purposes of estimating criteria pollutant precursor emissions, the two terms are often used interchangeably.

emissions and reduction strategies related to mobile sources are considered in the Attainment Plan and SIP.

Toxic Air Contaminants

Toxic air contaminants (TACs) are a diverse group of air pollutants that may cause or contribute to an increase in deaths or in serious illness, or that may pose a present or potential hazard to human health. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage, or short-term acute effects such as eye watering, respiratory irritation (a cough), runny nose, throat pain, and headaches. TACs may be carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For carcinogenic TACs, there is no level of exposure that is considered safe, and impacts are evaluated in terms of overall relative risk expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

Diesel engines emit a complex mixture of air pollutants, including both gaseous and solid material. The solid material in diesel exhaust is referred to as diesel particulate matter (DPM). Almost all DPM is 10 microns or less in diameter, and 90 percent of DPM is less than 2.5 microns in diameter (CARB 2021a). Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung. In 1998, CARB identified DPM as a TAC based on published evidence of a relationship between diesel exhaust exposure and lung cancer and other adverse health effects. DPM has a notable effect on California's population—it is estimated that about 70 percent of total known cancer risk related to air toxics in California is attributable to DPM (CARB 2021a).

Asbestos is a mineral fiber that naturally occurs in some rock and soil. Long-term exposure to airborne asbestos fibers has been linked to major health effects including lung cancer; mesothelioma, a rare form of cancer that is found in the thin lining of the lung, chest, abdomen, and heart; and asbestosis, a serious progressive, long-term, non-cancer disease of the lungs (USEPA 2021b). Because of its fiber strength and heat resistance, asbestos has been used in structures constructed before 1979. Asbestos fibers may be released into the air by the disturbance of asbestos containing material (ACM) during demolition activities; or during earth disturbing activities in areas where naturally occurring asbestos (NOA) is present in the rock or soil. NOA is not likely to be present in the soil and rock of San Diego County (California Department of Conservation 2000).

Lead is a naturally occurring metallic element that is found in small amounts in the earth's crust. In addition to its status as a criteria pollutant, lead is listed as a TAC because, depending on the level and duration of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. There is also a probable link between lead exposure and kidney cancer, brain cancer (gliomas), and lung cancer (USEPA 2021c). Lead was commonly used as an additive to gasoline until sale of leaded gasoline was banned for most uses by the Clean Air Act in 1996. Because lead was emitted in vehicle exhaust for decades, aerially-deposited lead (ADL) may be present in the soils adjacent to older roadways. Lead particulate matter can also be emitted during demolition and renovation activities that disturb material that contains lead-based paint (LBP), most typically found in structures built before 1978.

Sensitive Receptors

CARB and the Office of Environmental Health Hazard Assessment (OEHHA) have identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, infants (including in utero in the third trimester of pregnancy), and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis (CARB 2005; OEHHA 2015). Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved and are referred to as sensitive receptors. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers.

The closest sensitive receptors to the project site are single- and multi-family residences adjacent to Camino Del Mar starting at the south end of the exiting bridge near the lagoon. The closest school to the project site is the Saint James Academy, approximately 2,000 feet northeast of the intersection of Camino Del Mar and Via De La Valle. There are no hospitals or day care centers within one mile of the project site.

GREENHOUSE GAS EMISSIONS REGULATORY FRAMEWORK

Greenhouse gases, as defined under California's Assembly Bill (AB) 32, include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6). AB 32, the California Global Warming Solutions Act of 2006, recognizes that California is a source of substantial amounts of GHG emissions. The statute states that:

> *Global warming poses a serious threat to the economic wellbeing, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.*

In order to help avert these potential consequences, AB 32 established a State goal of reducing GHG emissions to 1990 levels by the year 2020, which is a reduction of approximately 16 percent from forecasted emission levels, with further reductions to follow. In addition, AB 32 required CARB to develop a Scoping Plan to help the State achieve the targeted GHG emission reductions. In 2015, Executive Order (EO) B-30-15 established a California GHG emission reduction target of 40 percent below 1990 levels by 2030. The EO aligns California's GHG emission reduction targets with those of leading international governments, including the 28 nation European Union. California is on track to meet or exceed the target of reducing GHG emissions to 1990 levels by 2020, with annual emissions in 2016 through 2019 below the 2020 target (CARB 2021b). As a follow-up to AB 32 and in response to EO-B-30-15, Senate Bill (SB) 32 was passed by the California legislature in 2016 to codify the EO's California GHG emission reduction target of 40 percent below 1990 levels by 2030. The most recent update to the Scoping Plan was adopted in December 2017 and establishes a proposed framework for California to meet the EO-B-30-15 reduction target (CARB 2017).

The City adopted a Climate Action Plan (CAP) in June 2016 which sets targets for reducing greenhouse gas emissions by 2020 and 2035; identifies strategies to meet the targets; and formulates a plan for

implementation. The CAP aims to reduce GHGs from the baseline year (2015) levels 15 percent by 2020, and 50 percent by 2035. The CAP also includes a renewable energy goal of 50 percent by 2020 and 100 percent by 2035. Additional CAP strategies include reducing water consumption and waste generation, promoting energy efficiency, and encouraging sustainable transportation alternatives (City of Del Mar 2016).

METHODOLOGY AND ASSUMPTIONS

Criteria pollutant emissions for project construction were estimated using the California Emissions Estimator Model (CalEEMod), Version 2020.4.0. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. The model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California air districts. CalEEMod allows for the use of default data (e.g., emission factors, trip lengths, meteorology, source inventory) provided by the various California air districts to account for local requirements and conditions, and/or user-defined inputs. The calculation methodology and default data used in the model are available in the CalEEMod User's Guide, Appendices A, D, and E (CAPCOA 2021). The CalEEMod output files are included in Attachment A to this letter.

Construction is anticipated commence as early as June 2024 and be completed in August 2026 for an overall duration of approximately 27 months. Table 2, *Construction Stage Activities*, shows the modeling assumptions for the general activities and approximate duration of each activity.

Table 2
CONSTRUCTION STAGE ACTIVITIES

Stage	Activity	Workdays
Stage 1 – Site Preparation June 2024 to July 2024	Site Preparation	43
	Night Delivery (concurrent with site prep)	4
Stage 2 – Replace East Side August 2024 to May 2025	Temporary Trestle	10
	Coffer Dams for Demolition	32
	Bridge Demolition	22
	Coffer Dams for Piers	11
	Bridge Piers Forms and Steel	50
	Bridge Piers Concrete Pour	27
	Bridge Deck Forms and Steel	30
	Night Delivery (Concurrent with Bridge Deck)	4
	Bridge Deck Concrete Pour	30
	Paving	4
	Pavement Marking	1
Stage 3 – Replace West Side June 2025 to March 2026	Temporary Trestle	10
	Coffer Dams for Demolition	32
	Bridge Demolition	22
	Coffer Dams for Piers	11
	Bridge Piers Forms and Steel	50
	Bridge Piers Concrete Pour	27
	Bridge Deck Forms and Steel	30

Stage	Activity	Workdays
	Night Delivery (Concurrent with Bridge Deck)	4
	Bridge Deck Concrete Pour	29
	Paving	4
	Pavement Marking	1
Stage 4 – Close Bridge Median April 2026 to May 2026	Bridge Gap Forms and Steel	20
	Bridge Gap Concrete Pour	21
Stage 5 – Final Improvements June 2026 to August 2026	Final Contour Grading	14
	Signage Installation	12
	Final Pavement Marking	2
	Water Lines and Runoff Devices	20
	Cleanup and Demobilization	18

The assumed equipment types and quantity used in the analysis is shown in Table 3, *Off-Road Equipment*. Because the specific models of equipment to be used was not known at the time of this analysis, modeling used default specifications for typical off-road construction equipment, as described in the *CalEEMod User's Guide*, Appendix D (CAPCOA 2021). All equipment was assumed to operate 8 hours per workday. The construction emissions modeling assumes the implementation of standard dust control best management practices to meet the requirements of the SDAPCD Rule 55, including watering all exposed surfaces twice daily (SDAPCD 2009).

Table 3
OFF-ROAD EQUIPMENT

Activity	Equipment	Quantity
Site Preparation	Air Compressors	2
	Concrete/Industrial Saws	1
	Crawler Tractors	1
	Generator Sets	2
	Rough Terrain Forklifts	1
	Rubber-Tired Loaders	1
	Tractors/Loader/Backhoes	2
Temporary Trestle	Air Compressors	2
	Cranes	2
	Crawler Tractors	1
	Excavators	2
	Generator Sets	2
	Rough Terrain Forklifts	2
	Rubber-Tired Loaders	1
	Tractors/Loader/Backhoes	2
	Welders	1
Coffer Dams	Air Compressors	2
	Cranes	3
	Excavators	2
	Generator Sets	2
	Pumps	3
	Rough Terrain Forklifts	1
	Tractors/Loader/Backhoes	2
	Welders	1

Activity	Equipment	Quantity
Bridge Demolition	Air Compressors	2
	Concrete/Industrial Saws	1
	Cranes	2
	Excavators	2
	Generator Sets	2
	Tractors/Loader/Backhoes	3
Bridge Piers Forms and Steel	Air Compressors	2
	Bore/Drill Rigs	1
	Cranes	2
	Excavators	2
	Generator Sets	2
	Pumps	2
	Rough Terrain Forklifts	1
	Tractors/Loader/Backhoes	2
	Welders	2
Bridge Piers Concrete Pour	Air Compressors	2
	Cranes	2
	Generator Sets	2
	Concrete Pump Truck	1
	Tractors/Loader/Backhoes	1
Bridge Deck Forms and Steel	Air Compressors	2
	Cranes	2
	Generator Sets	2
	Rough Terrain Forklifts	1
	Tractors/Loader/Backhoes	1
	Welders	2
Night Deliveries	Cranes	1
	Generator Sets	2
	Rough Terrain Forklifts	1
	Tractors/Loader/Backhoes	1
Bridge Deck Concrete Pour	Air Compressors	2
	Generator Sets	2
	Concrete Pump Truck	1
	Tractors/Loader/Backhoes	1
	Bidwell Concrete Machine	1
Paving	Pavers	1
	Paving Equipment	1
	Rollers	1
	Tractors/Loader/Backhoes	1
Pavement Marking	Air Compressor	1
	Striping Truck	1
Bridge Gap Forms and Steel	Air Compressors	2
	Cranes	1
	Generator Sets	2
	Rough Terrain Forklifts	1
	Tractors/Loader/Backhoes	1
	Welders	2

Activity	Equipment	Quantity
Bridge Gap Concrete Pour	Air Compressors	2
	Generator Sets	2
	Concrete Pump Truck	1
	Tractors/Loader/Backhoes	1
Final Contour Grading	Crawler Tractors	1
	Tractors/Loader/Backhoes	1
	Generator Sets	1
Signage Installation	Crane	1
	Tractors/Loader/Backhoes	1
	Generator Sets	1
Water Lines and Runoff Devices	Air Compressors	1
	Cranes	1
	Generator Sets	1
	Rough Terrain Forklifts	1
	Tractors/Loader/Backhoes	1
Cleanup and Demobilization	Cranes	1
	Generator Sets	1
	Rough Terrain Forklifts	1
	Tractors/Loader/Backhoes	1

Project specific details for worker trips, material trips and hauling trips were not available at the time of this analysis. Worker trips were modeled based on equipment estimates, anticipated activity, and assumptions from past similar projects. Hauling trips were modeled based on material requirements reported by the project engineers: 4,100 cubic yards (CY) of soil for abutments and 5,138 CY of concrete for the bridge. Demolition hauling assumed that the volume of debris would be approximately 150 percent of the new concrete volume, or 7,800 CY. An additional 200 round-trip hauling trips were assumed for mobilization and demobilization for material and equipment transportation. The use of medium and heavy trucks (e.g., traffic control vehicles, flatbed trucks, tool trucks, water trucks) around the project site and staging areas was accounted for in the modeling with daily vendor trips. The on-road trip assumptions are shown in Table 4, *Construction Trips*. The CalEEMod default trip distances were used in the modeling.

Table 4
CONSTRUCTION TRIPS

Activity	Daily Worker Trips[1]	Daily Vendor Trips[1]	Total Haul Trips[1]
Mobilization, Demobilization	50	10	400
Demolition	100	10	500
Site preparation, temporary trestles, coffers, falsework, forms, steel work	100	10	1,024
Concrete pour	50	10	620
Paving	40	10	40
Pavement Striping	20	0	0

[1] Round trips.

SIGNIFICANCE CRITERIA

Air Quality

Thresholds used to evaluate potential air quality and odor impacts are based on applicable criteria in the State's CEQA Guidelines Appendix G, the City's CEQA Significance Determination Thresholds (2016), and applicable air district screening-level thresholds described below. A significant air quality and/or odor impact could occur if the Program would:

1. Conflict with or obstruct the implementation of the San Diego Attainment Plan or applicable portions of the SIP;

2. Result in a cumulatively considerable net increase of any criteria pollutant for which the Program region is non-attainment under an applicable federal or state ambient air quality standard;

3. Expose sensitive receptors (including, but not limited to, residences, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations; or

4. Create objectionable odors affecting a substantial number of people.

To determine whether the Program would (a) result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation, or (b) result in a cumulatively considerable net increase of PM_{10}, $PM_{2.5}$, or the ozone precursors NO_X and VOCs, emissions were evaluated based on the quantitative emission thresholds established by the SDAPCD. As part of its air quality permitting process, the SDAPCD has established thresholds in Rule 20.2 for the preparation of Air Quality Impact Assessments (AQIAs; SDAPCD 2019). In the absence of a significance threshold for $PM_{2.5}$ from the SDAPCD or the City, the SCAQMD's screening threshold of 55 pounds per day or 10 tons per year was applied to this analysis (SCAQMD 2019).

For CEQA purposes, these screening criteria were used as numeric methods to determine if the Program would result in a significant impact to air quality or an adverse effect on human health. The screening thresholds are shown in Table 5, *Screening-level Thresholds for Air Quality Impact Analysis*.

Table 5
SCREENING-LEVEL THRESHOLDS FOR AIR QUALITY IMPACT ANALYSIS

Pollutant	Threshold
Construction Emissions (Pounds/Day)	
Respirable Particulate Matter (PM_{10})	100
Fine Particulate Matter ($PM_{2.5}$)	55
Oxides of Nitrogen (NO_X)	250
Oxides of Sulfur (SO_X)	250
Carbon Monoxide (CO)	550
Volatile Organic Compounds (VOCs)	137

Pollutant	Threshold
Toxic Air Contaminant Health Risk	
Excess Cancer Risk	1 in 1 million 10 in 1 million with T-BACT
Non-Cancer Hazard	1.0

Source: SDAPCD 2019
T-BACT = Toxics-Best Available Control Technology

SDAPCD Rule 51 (Nuisance) prohibits emissions from any source whatsoever in such quantities of air contaminants or other material, which cause injury, detriment, nuisance, or annoyance to the public health or damage to property (SDAPCD 1976). It is generally accepted that the considerable number of persons requirement in Rule 51 is normally satisfied when 10 different individuals/households have made separate complaints within 90 days. Odor complaints from a "considerable" number of persons or businesses in the area would be considered to be a significant, adverse odor impact.

Greenhouse Gas Emissions

Thresholds used to evaluate potential air quality and odor impacts are based on applicable criteria in the State's CEQA Guidelines Appendix G. A significant GHG emissions impact could occur if the Program would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

As discussed above, in 2016 the City adopted a CAP which can be used to determine the significance of a project's GHG emissions. GHG emissions impacts for project's which are consistent with the CAP, would be less than significant. However, the GHG reduction strategies and actions contained in the CAP are not applicable to the project construction activities, nor are construction emissions included in the City GHG emissions inventory. An appropriate bright line threshold would be a more conservative approach to determining the significance of the Program's GHG emissions

To establish context in which to consider the Proposed Project's GHG emissions, this analysis reviewed guidelines used by other experts and public agencies. Prior to 2020, a screening level based on the CAPCOA report *CEQA & Climate Change* was used as a tool used to determine whether further analysis would be needed to examine the GHG impacts of a project (CAPCOA 2008). CAPCOA developed a 900 MT CO_2e per year screening threshold by analyzing the capture of 90 percent or more of future discretionary development for residential and commercial projects across the state. Direct and cumulative impacts would be potentially significant and require further analysis if a project results in emissions that exceed 900 MT CO_2e beyond current baseline emissions. This screening threshold was developed with the goal in mind of achieving the reductions described by AB 32 for meeting 1990 levels of statewide GHG emissions by the year 2020.

Subsequently, SB 32 set a further GHG emission reduction target of 40 percent below 1990 levels by 2030. To achieve this target, a regression trajectory can be projected by reducing the operational year emissions goal from the 900 MT CO_2e target in 2020 to the 540 MT CO_2e target in 2030. This trajectory is

outlined in Table 6, *GHG Screening Level Trajectory*, below. Therefore, for the purpose this report, 540 MT CO_2e is considered a valid and adequate screening level as it is based on current methodologies. It is not the intent of the County to adopt the above screening levels as mass emission limits for this or other projects, but rather to disclose this information and put the Program generated GHG emissions in the appropriate statewide context and consider the Program's potential impacts pursuant to CEQA.

Table 6
GHG SCREENING LEVEL TRAJECTORY

Year	Screening Level (MT CO_2e)
2020	900
2021	855
2022	813
2023	722
2024	734
2025	697
2026	662
2027	629
2028	598
2029	568
2030	540

Source: CAPCOA 2008; SB 32
Note: Emissions reduce by 4.98 percent each year to achieve SB 32's 2030 target.
MT = metric tons; CO_2e = carbon dioxide equivalents

The above screening level threshold is intended to evaluate a project's long-term annual contribution to GHG emission inventories. Emissions from construction activities only occur during the construction period and are not included in the City's GHG inventory. To determine the project's contribution to future annual City GHG emissions inventories, the construction emissions are amortized (e.g., averaged) over the anticipated lifespan of the project.

AIR QUALITY IMPACT ANALYSIS

(1) Conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant Impact. A project would be inconsistent with the Attainment Plan if it is inconsistent with the population and employment growth assumptions within the General Plan or if the Program's emissions would exceed the applicable thresholds, as analyzed in checklist question (2).

As discussed in checklist question (2), construction of the project would not result in pollutant emissions in excess of applicable thresholds. Because construction emissions would be below the applicable thresholds, and because the project would replace a bridge and would not result in population or employment increases, the proposed project would not conflict with or obstruct implementation of the Attainment Plan for the SDAB and impacts would be less than significant.

(2) Result in a cumulatively considerable net increase of any criteria pollutant for which the Program region is non-attainment under an applicable federal or state ambient air quality standard?

Less than Significant Impact. The project's construction emissions were estimated using equipment assumptions, as described above. The emissions generated from construction activities would include:

- Dust (including PM_{10} and $PM_{2.5}$) primarily from fugitive sources such as soil disturbance and vehicle travel over unpaved surfaces;
- Combustion emissions of air pollutants (including VOC, NO_X, PM_{10}, $PM_{2.5}$, CO, and SO_X), primarily from: operation of heavy off-road equipment; portable generators, pumps and air compressor; on-road worker commute vehicle traveling to and from the project site; and trucks hauling equipment, material, and debris to and from the project site; and
- Emissions of VOCs from the application of asphalt and pavement marking.

The results of the calculations for project construction activities are shown in Table 7, *Maximum Daily Emissions*. The data are presented as the maximum anticipated daily emissions for comparison with the SDAPCD thresholds, the model output is included as Attachment A to this letter.

Table 7
MAXIMUM DAILY EMISSIONS

Construction Stage	VOC[1]	NO_X[1]	CO[1]	SO_X[1]	PM_{10}[1]	$PM_{2.5}$[1]
Stage 1	4.0	35.2	43.4	<0.1	3.1	1.8
Stage 2	21.6	33.5	44.6	<0.1	3.6	1.8
Stage 3	21.6	33.4	46.4	<0.1	3.6	1.8
Stage 4	2.3	16.9	24.5	<0.1	2.0	1.0
Stage 5	7.7	10.1	11.8	<0.1	1.2	0.6
Maximum Daily Emissions	**21.6**	**35.2**	**46.4**	**0.1**	**3.6**	**1.8**
SDAPCD Thresholds	*137*	*250*	*550*	*250*	*100*	*67*
Exceed Thresholds?	***No***	***No***	***No***	***No***	***No***	***No***

Source: CalEEMod (output data is provided in Attachment A)
[1] Pollutant Emissions (pounds per day).
VOC = volatile organic compound; NO_X = nitrogen oxides; CO = carbon monoxide; SO_X = sulfur oxides;
PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter;
SDAPCD = San Diego County Air Pollution Control District

As shown in Table 7, The project's emissions would not exceed SDAPCD thresholds and would not result in a cumulatively considerable net increase of any criteria pollutant. Once operational, the new bridge would not result in changes to emissions from traffic on public roadways or from bridge maintenance activities, compared to existing conditions. Therefore, the impact would be less than significant

(3) Expose sensitive receptors to substantial pollutant concentrations?

Less than Significant Impact. Construction of the project would result in DPM. The amount to which the receptors could be exposed, which is a function of concentration and duration of exposure, is the primary factor used to determine health risk. Current models and methodologies for conducting cancer health risk assessments are associated with longer-term exposure periods (typically 30 years for

individual residents) and are best suited for evaluation of long duration TAC emissions with predictable schedules and locations. These assessment models and methodologies do not correlate well with the temporary and highly variable nature of construction activities. The total construction period is anticipated to last approximately 27 months. The most intense use of heavy equipment is anticipated to occur around the bridge in the lagoon and would not occur adjacent any individual residence for extended periods. In addition, the prevailing ocean breezes would rapidly disperse emissions. Due to the variable and sporadic nature of construction activity, and the anticipated short construction schedule, the project's construction activity would not expose sensitive receptors to substantial concentrations of DPM.

According to the Initial site Assessment (ISA) for the project, the Camino Del Mar Bridge has existed since at least 1928 and the potential exists for ADL to be encountered in soil during construction activities. The ISA recommends that soil sampling for the presence of ADL be performed in unpaved locations of the Project area prior to construction activities, and (if lead is detected) a lead compliance plan be prepared prior to the start of construction activities (Kleinfelder 2021).

According to the ISA, due to the age of the bridge, the potential exists for ACMs and LBP to be present. Demolition activities on the project site could result in the disturbance of ACMs and LPB. In accordance with the SDAPCD Rule 1206, *Asbestos Removal, Renovation, and Demolition*, prior to commencement of renovation or demolition operations and prior to submitting the notifications required by Section (e) of Rule 1206, a facility survey shall be performed to determine the presence or absence of ACM, regardless of the age of the facility (SDAPCD 2017). An LBP survey shall be performed in accordance with California Department of Public Health (CDPH) guidelines (Kleinfelder 2021). In addition, airborne asbestos is regulated in accordance with the National Emission Standards for Hazardous Air Pollutants (NESHAP) asbestos regulations. Following notification of the SDAPCD and other applicable local agencies, and following identification of friable ACMs, SDAPCD Rule 1206 and federal and state Occupational and Safety Health Administration (OSHA) regulations require that asbestos trained and certified abatement personnel perform asbestos abatement and that all ACMs removed from the project site must be hauled to a licensed receiving facility and disposed of under proper manifest by a transportation company certified to handle asbestos. These regulations specify precautions and safe work practices that must be followed to minimize the potential for release of asbestos fibers. Completion of ACM and LPB surveys, and adherence to SDAPCD and OSHA regulations for the identification, removal, and transport of ACMs and LBP would ensure the project's construction activity would not expose sensitive receptors to substantial pollutant concentrations of airborne asbestos and LBP.

The ISA also identified the potential for treated wood waste to be present associated with guard rail posts or pedestrian walkway decking within the project area. Sampling of the sign, guard rail posts, and/or decking for the presence of wood-preserving chemicals shall be completed prior to demolition, and treated wood waste shall be handled consistent with Caltrans' Standard Special Provisions 14-11.14 (Kleinfelder 2021). Completion of sampling and adherence to Caltrans' Standard Special Provisions would ensure the project's construction activity would not expose sensitive receptors to substantial pollutant concentrations of TACs from preserved wood.

Impact Conclusion: Project construction activities would not result in the exposure of sensitive receptors to substantial pollutant concentrations and the impact would be less than significant.

(4) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less than Significant Impact. The project could produce odors during construction activities resulting from heavy diesel equipment exhaust and VOC released during application of paint or asphalt. Standard best management practices to minimize equipment idling and maintain equipment would minimize the odor emissions from equipment exhaust and their associated impacts. Any odors emitted during construction activities would be temporary, short-term, and intermittent in nature, and would cease upon the facility maintenance. In addition, the prevailing ocean breezes would rapidly disperse odors. Therefore, odor impacts from construction activities would be less than significant due to the duration of exposure.

GREENHOUSE GAS EMISSIONS IMPACT ANALYSIS

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than Significant Impact. During construction, the use off-road vehicles and equipment, and on-road vehicles traveling to and from the project site, would result in emissions of GHGs from engine exhaust. Table 8, *Construction GHG Emissions*, presents the summary of GHGs emissions for the project, the model output is included as Attachment A to this letter.

Table 8
CONSTRUCTION GHG EMISSIONS

Stage/Year	MT CO_2e per year
Stage 1 2024	122.3
Stage 2 2024	432.7
Stage 2 2025	310.6
Stage 3 2025	545.4
Stage 3 2026	166.4
Stage 4 2026	87.8
Stage 5 2026	78.9
Total Construction Emissions	1,744.1
Amortized emissions (30 years)	**58.1**
2030 Screening Threshold	*540*
Exceed Threshold?	**No**

Source: CalEEMod (output data is provided in Attachment A)
GHG = greenhouse gas; CO_2e = carbon dioxide equivalents

As shown in Table 8, construction of the project has been conservatively estimated to result in approximately 58 MT CO_2e annually, amortized over the estimated 30-year lifespan of the bridge.[3] Once operational, the new bridge would not result in changes to emissions from traffic on public roadways or from bridge maintenance activities, compared to existing conditions. Emissions resulting from implementation of the Program would not exceed the screening threshold of 540 MT CO_2e adjusted

[3] Although prestressed concrete bridges may last 100 or more years, for the purposes of evaluating GHG emissions, the lifespan of the bridge is the shortest anticipated period before major repair or retrofit would be required.

from CAPCOA for compliance with SB 32 in 2030. Therefore, the implementation of the Program would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and the impact would be less than significant.

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Less than Significant Impact. The project would replace an existing bridge on a public roadway for public health and safety. The project would not generate growth in population or employment or require the alteration of an existing land use designation through amendments to general plans or changes to zoning. Long-term operation of the bridge would not result in changes to GHG emissions from traffic or maintenance activities, compared to the existing condition. Furthermore, as shown in Table 8, project construction would not result in a significant increase in GHG emissions. Therefore, the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, including the City's CAP. The impact would be less than significant.

SUMMARY

As described above, emissions of criteria pollutants would be below SDAPCD thresholds, and the project would be consistent with the Attainment Plan. Sensitive receptors would not be exposed to substantial concentrations of TACs or odors. Impacts to air quality would be less than significant and no mitigation measures would be required. The project would not result in annual GHG emissions in excess of the 2030 screening threshold and the project would not conflict with GHG reduction plans. Impacts related to GHG emissions would be less than significant and no mitigation measures would be required.

Sincerely,

Martin Rolph
Air Quality Specialist

Victor Ortiz
Senior Air Quality Specialist

Attachments:

Figure 1: Regional Location
Figure 2: Project Location
Figure 3: Construction Work Areas
Attachment A: CalEEMod Output

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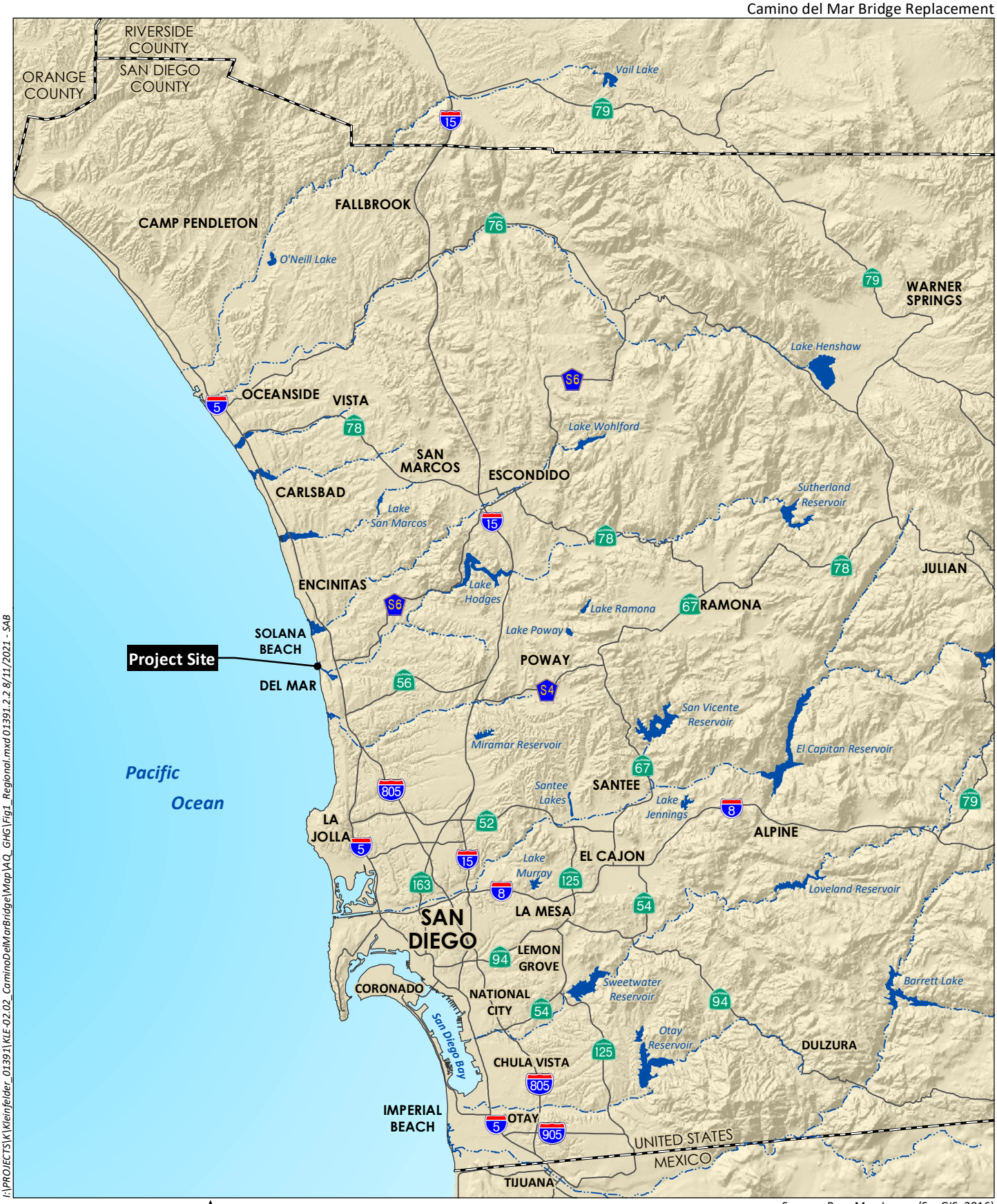
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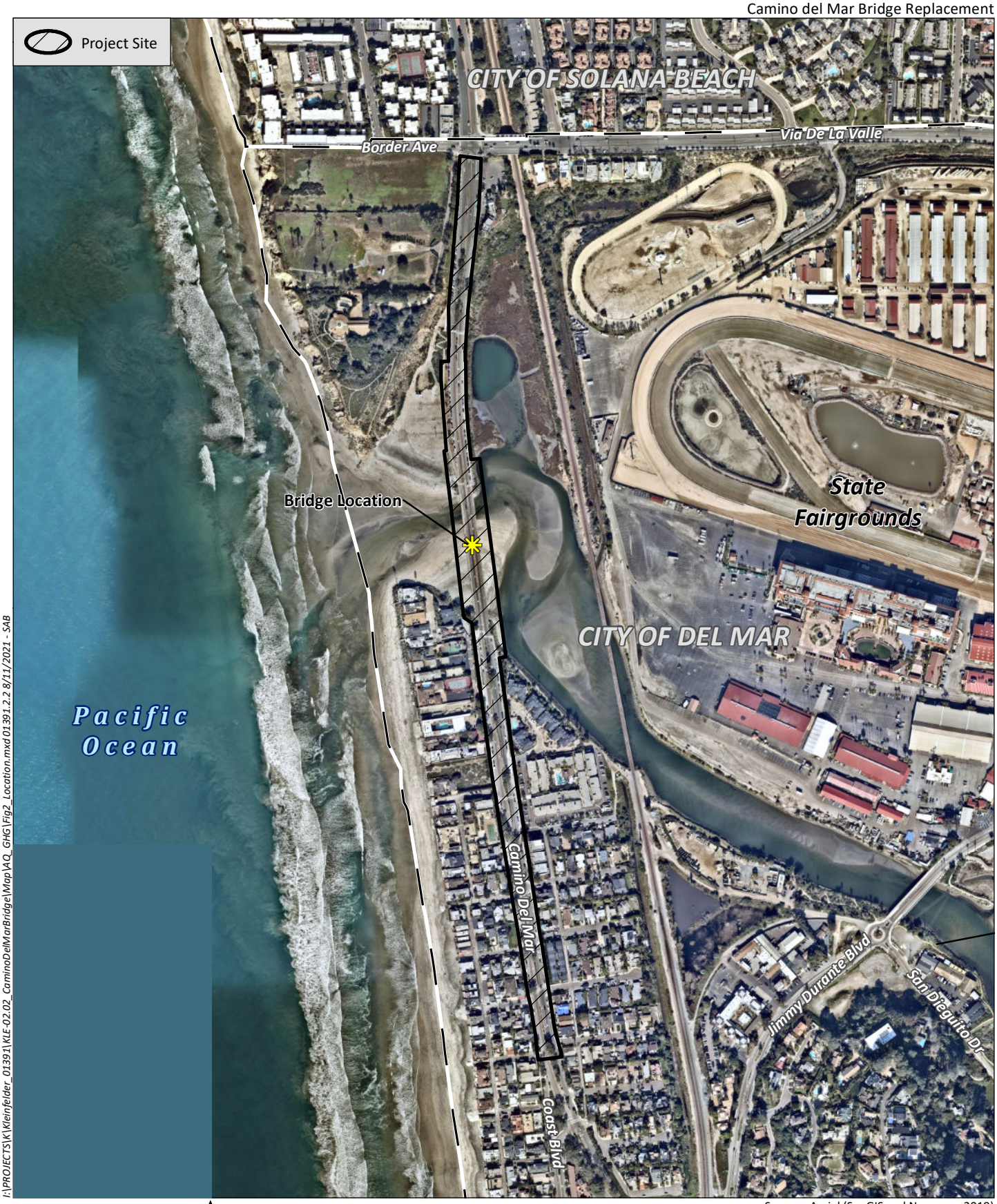
0 8 Miles

Source: Base Map Layers (SanGIS, 2016)

HELIX Environmental Planning

Regional Location

Figure 1



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0 600 Feet

Source: Aerial (SanGIS and Nearmap, 2019)

HELIX Environmental Planning

Project Location

Figure 2

Camino del Mar Bridge Replacement



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0 300 Feet

Source: Aerial (Nearmap, 2021)

HELIX Environmental Planning

Construction Work Areas

Figure 3

Attachment A

CalEEMod Output

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Camino Del Mar Bridge Replacement Stage 1

San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	50.00	1000sqft	1.15	50,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2027
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - This model is for construction impacts only.

Land Use - Land use area is approximate footprint of construction area and is not used in model calculations.

Construction Phase - Construction schedule per project engineers.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.

Trips and VMT - Trips based on equipment estimates, stage activity and material requirements.

Grading -

Construction Off-road Equipment Mitigation - Dust mitigation to meet SDAPCD Rule 55 requirments.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	2.00	43.00

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstructionPhase	NumDays	2.00	4.00
tblConstructionPhase	PhaseEndDate	6/4/2024	7/31/2024
tblConstructionPhase	PhaseEndDate	6/6/2024	7/4/2024
tblConstructionPhase	PhaseStartDate	6/5/2024	7/1/2024
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	WorkerTripNumber	25.00	50.00
tblTripsAndVMT	WorkerTripNumber	13.00	50.00

2.0 Emissions Summary

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.0590	0.5233	0.6349	1.3700e-003	0.0292	0.0212	0.0504	6.0000e-003	0.0204	0.0264	0.0000	121.2721	121.2721	0.0184	1.8200e-003	122.2728
Maximum	**0.0590**	**0.5233**	**0.6349**	**1.3700e-003**	**0.0292**	**0.0212**	**0.0504**	**6.0000e-003**	**0.0204**	**0.0264**	**0.0000**	**121.2721**	**121.2721**	**0.0184**	**1.8200e-003**	**122.2728**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.0590	0.5233	0.6349	1.3700e-003	0.0229	0.0212	0.0441	5.3200e-003	0.0204	0.0257	0.0000	121.2720	121.2720	0.0184	1.8200e-003	122.2727
Maximum	**0.0590**	**0.5233**	**0.6349**	**1.3700e-003**	**0.0229**	**0.0212**	**0.0441**	**5.3200e-003**	**0.0204**	**0.0257**	**0.0000**	**121.2720**	**121.2720**	**0.0184**	**1.8200e-003**	**122.2727**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**21.49**	**0.00**	**12.45**	**11.33**	**0.00**	**2.58**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2024	8-31-2024	0.5810	0.5810
		Highest	0.5810	0.5810

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Stage 1 Site Preparation	Site Preparation	6/1/2024	7/31/2024	5	43	
2	Stage 1 Night Delivery	Site Preparation	7/1/2024	7/4/2024	5	4	

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Acres of Grading (Site Preparation Phase): 21.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 1.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Stage 1 Site Preparation	Air Compressors	2	8.00	78	0.48
Stage 1 Site Preparation	Concrete/Industrial Saws	1	8.00	81	0.73
Stage 1 Site Preparation	Crawler Tractors	1	8.00	212	0.43
Stage 1 Site Preparation	Generator Sets	2	8.00	84	0.74
Stage 1 Site Preparation	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 1 Site Preparation	Rubber Tired Loaders	1	8.00	203	0.36
Stage 1 Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Stage 1 Night Delivery	Cranes	1	8.00	231	0.29
Stage 1 Night Delivery	Generator Sets	2	8.00	84	0.74
Stage 1 Night Delivery	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 1 Night Delivery	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Stage 1 Site Preparation	10	50.00	10.00	200.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 1 Night Delivery	5	50.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 1 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0114	0.0000	0.0114	1.2300e-003	0.0000	1.2300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0523	0.4746	0.5647	1.1000e-003		0.0200	0.0200		0.0193	0.0193	0.0000	95.3905	95.3905	0.0169	0.0000	95.8123
Total	**0.0523**	**0.4746**	**0.5647**	**1.1000e-003**	**0.0114**	**0.0200**	**0.0314**	**1.2300e-003**	**0.0193**	**0.0205**	**0.0000**	**95.3905**	**95.3905**	**0.0169**	**0.0000**	**95.8123**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.2000e-004	0.0135	3.6600e-003	6.0000e-005	1.7100e-003	1.1000e-004	1.8200e-003	4.7000e-004	1.1000e-004	5.8000e-004	0.0000	5.8959	5.8959	3.1000e-004	9.4000e-004	6.1833
Vendor	2.3000e-004	8.8100e-003	3.1600e-003	4.0000e-005	1.2900e-003	5.0000e-005	1.3400e-003	3.7000e-004	5.0000e-005	4.2000e-004	0.0000	3.8620	3.8620	1.2000e-004	5.6000e-004	4.0320
Worker	3.6000e-003	2.5400e-003	0.0328	1.1000e-004	0.0134	7.0000e-005	0.0135	3.5600e-003	6.0000e-005	3.6200e-003	0.0000	10.3719	10.3719	2.2000e-004	2.5000e-004	10.4505
Total	**4.0500e-003**	**0.0248**	**0.0396**	**2.1000e-004**	**0.0164**	**2.3000e-004**	**0.0166**	**4.4000e-003**	**2.2000e-004**	**4.6200e-003**	**0.0000**	**20.1298**	**20.1298**	**6.5000e-004**	**1.7500e-003**	**20.6657**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 1 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.1300e-003	0.0000	5.1300e-003	5.5000e-004	0.0000	5.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0523	0.4746	0.5647	1.1000e-003		0.0200	0.0200		0.0193	0.0193	0.0000	95.3903	95.3903	0.0169	0.0000	95.8122
Total	**0.0523**	**0.4746**	**0.5647**	**1.1000e-003**	**5.1300e-003**	**0.0200**	**0.0251**	**5.5000e-004**	**0.0193**	**0.0198**	**0.0000**	**95.3903**	**95.3903**	**0.0169**	**0.0000**	**95.8122**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.2000e-004	0.0135	3.6600e-003	6.0000e-005	1.7100e-003	1.1000e-004	1.8200e-003	4.7000e-004	1.1000e-004	5.8000e-004	0.0000	5.8959	5.8959	3.1000e-004	9.4000e-004	6.1833
Vendor	2.3000e-004	8.8100e-003	3.1600e-003	4.0000e-005	1.2900e-003	5.0000e-005	1.3400e-003	3.7000e-004	5.0000e-005	4.2000e-004	0.0000	3.8620	3.8620	1.2000e-004	5.6000e-004	4.0320
Worker	3.6000e-003	2.5400e-003	0.0328	1.1000e-004	0.0134	7.0000e-005	0.0135	3.5600e-003	6.0000e-005	3.6200e-003	0.0000	10.3719	10.3719	2.2000e-004	2.5000e-004	10.4505
Total	**4.0500e-003**	**0.0248**	**0.0396**	**2.1000e-004**	**0.0164**	**2.3000e-004**	**0.0166**	**4.4000e-003**	**2.2000e-004**	**4.6200e-003**	**0.0000**	**20.1298**	**20.1298**	**6.5000e-004**	**1.7500e-003**	**20.6657**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 1 Night Delivery - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3000e-003	0.0228	0.0273	5.0000e-005		9.5000e-004	9.5000e-004		9.1000e-004	9.1000e-004	0.0000	4.4278	4.4278	7.9000e-004	0.0000	4.4476
Total	**2.3000e-003**	**0.0228**	**0.0273**	**5.0000e-005**	**0.0000**	**9.5000e-004**	**9.5000e-004**	**0.0000**	**9.1000e-004**	**9.1000e-004**	**0.0000**	**4.4278**	**4.4278**	**7.9000e-004**	**0.0000**	**4.4476**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	8.2000e-004	2.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.3593	0.3593	1.0000e-005	5.0000e-005	0.3751
Worker	3.3000e-004	2.4000e-004	3.0500e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	0.9648	0.9648	2.0000e-005	2.0000e-005	0.9721
Total	**3.5000e-004**	**1.0600e-003**	**3.3400e-003**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3700e-003**	**3.6000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.3241**	**1.3241**	**3.0000e-005**	**7.0000e-005**	**1.3472**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 1 Night Delivery - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3000e-003	0.0228	0.0273	5.0000e-005		9.5000e-004	9.5000e-004		9.1000e-004	9.1000e-004	0.0000	4.4277	4.4277	7.9000e-004	0.0000	4.4476
Total	**2.3000e-003**	**0.0228**	**0.0273**	**5.0000e-005**	**0.0000**	**9.5000e-004**	**9.5000e-004**	**0.0000**	**9.1000e-004**	**9.1000e-004**	**0.0000**	**4.4277**	**4.4277**	**7.9000e-004**	**0.0000**	**4.4476**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	8.2000e-004	2.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.3593	0.3593	1.0000e-005	5.0000e-005	0.3751
Worker	3.3000e-004	2.4000e-004	3.0500e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	0.9648	0.9648	2.0000e-005	2.0000e-005	0.9721
Total	**3.5000e-004**	**1.0600e-003**	**3.3400e-003**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3700e-003**	**3.6000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.3241**	**1.3241**	**3.0000e-005**	**7.0000e-005**	**1.3472**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.568480	0.062094	0.174123	0.115064	0.023357	0.006399	0.009361	0.006325	0.000693	0.000596	0.028205	0.000919	0.004383

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Unmitigated	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Camino Del Mar Bridge Replacement Stage 1

San Diego County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	50.00	1000sqft	1.15	50,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2027
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - This model is for construction impacts only.

Land Use - Land use area is approximate footprint of construction area and is not used in model calculations.

Construction Phase - Construction schedule per project engineers.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.

Trips and VMT - Trips based on equipment estimates, stage activity and material requirements.

Grading -

Construction Off-road Equipment Mitigation - Dust mitigation to meet SDAPCD Rule 55 requirments.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	2.00	43.00

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstructionPhase	NumDays	2.00	4.00
tblConstructionPhase	PhaseEndDate	6/4/2024	7/31/2024
tblConstructionPhase	PhaseEndDate	6/6/2024	7/4/2024
tblConstructionPhase	PhaseStartDate	6/5/2024	7/1/2024
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	WorkerTripNumber	25.00	50.00
tblTripsAndVMT	WorkerTripNumber	13.00	50.00

2.0 Emissions Summary

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.9852	35.1617	43.3938	0.0932	2.0114	1.4218	3.4333	0.4536	1.3657	1.8193	0.0000	9,084.0378	9,084.0378	1.3535	0.1310	9,156.9245
Maximum	**3.9852**	**35.1617**	**43.3938**	**0.0932**	**2.0114**	**1.4218**	**3.4333**	**0.4536**	**1.3657**	**1.8193**	**0.0000**	**9,084.0378**	**9,084.0378**	**1.3535**	**0.1310**	**9,156.9245**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	3.9852	35.1617	43.3938	0.0932	1.7198	1.4218	3.1416	0.4221	1.3657	1.7878	0.0000	9,084.0378	9,084.0378	1.3535	0.1310	9,156.9245
Maximum	**3.9852**	**35.1617**	**43.3938**	**0.0932**	**1.7198**	**1.4218**	**3.1416**	**0.4221**	**1.3657**	**1.7878**	**0.0000**	**9,084.0378**	**9,084.0378**	**1.3535**	**0.1310**	**9,156.9245**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**14.50**	**0.00**	**8.49**	**6.94**	**0.00**	**1.73**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**	**0.0000**	**0.0117**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**	**0.0000**	**0.0117**

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Stage 1 Site Preparation	Site Preparation	6/1/2024	7/31/2024	5	43	
2	Stage 1 Night Delivery	Site Preparation	7/1/2024	7/4/2024	5	4	

Acres of Grading (Site Preparation Phase): 21.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 1.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Stage 1 Site Preparation	Air Compressors	2	8.00	78	0.48
Stage 1 Site Preparation	Concrete/Industrial Saws	1	8.00	81	0.73
Stage 1 Site Preparation	Crawler Tractors	1	8.00	212	0.43
Stage 1 Site Preparation	Generator Sets	2	8.00	84	0.74
Stage 1 Site Preparation	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 1 Site Preparation	Rubber Tired Loaders	1	8.00	203	0.36
Stage 1 Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Stage 1 Night Delivery	Cranes	1	8.00	231	0.29
Stage 1 Night Delivery	Generator Sets	2	8.00	84	0.74

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Stage 1 Night Delivery	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 1 Night Delivery	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Stage 1 Site Preparation	10	50.00	10.00	200.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 1 Night Delivery	5	50.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Stage 1 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5303	0.0000	0.5303	0.0573	0.0000	0.0573			0.0000			0.0000
Off-Road	2.4333	22.0761	26.2637	0.0511		0.9307	0.9307		0.8958	0.8958		4,890.6966	4,890.6966	0.8652		4,912.3261
Total	**2.4333**	**22.0761**	**26.2637**	**0.0511**	**0.5303**	**0.9307**	**1.4609**	**0.0573**	**0.8958**	**0.9530**		**4,890.6966**	**4,890.6966**	**0.8652**		**4,912.3261**

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 1 Site Preparation - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.7800e-003	0.6275	0.1715	2.7300e-003	0.0814	5.2000e-003	0.0866	0.0223	4.9800e-003	0.0273		302.4553	302.4553	0.0159	0.0481	317.1982
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.1863	0.1204	1.5160	5.1100e-003	0.6387	3.1500e-003	0.6418	0.1694	2.9000e-003	0.1723		527.0615	527.0615	0.0116	0.0127	531.1394
Total	**0.2068**	**1.1607**	**1.8373**	**9.6700e-003**	**0.7813**	**0.0107**	**0.7920**	**0.2093**	**0.0102**	**0.2195**		**1,027.7085**	**1,027.7085**	**0.0338**	**0.0896**	**1,055.2499**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2386	0.0000	0.2386	0.0258	0.0000	0.0258			0.0000			0.0000
Off-Road	2.4333	22.0761	26.2637	0.0511		0.9307	0.9307		0.8958	0.8958	0.0000	4,890.6966	4,890.6966	0.8652		4,912.3261
Total	**2.4333**	**22.0761**	**26.2637**	**0.0511**	**0.2386**	**0.9307**	**1.1693**	**0.0258**	**0.8958**	**0.9216**	**0.0000**	**4,890.6966**	**4,890.6966**	**0.8652**		**4,912.3261**

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 1 Site Preparation - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.7800e-003	0.6275	0.1715	2.7300e-003	0.0814	5.2000e-003	0.0866	0.0223	4.9800e-003	0.0273		302.4553	302.4553	0.0159	0.0481	317.1982
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.1863	0.1204	1.5160	5.1100e-003	0.6387	3.1500e-003	0.6418	0.1694	2.9000e-003	0.1723		527.0615	527.0615	0.0116	0.0127	531.1394
Total	**0.2068**	**1.1607**	**1.8373**	**9.6700e-003**	**0.7813**	**0.0107**	**0.7920**	**0.2093**	**0.0102**	**0.2195**		**1,027.7085**	**1,027.7085**	**0.0338**	**0.0896**	**1,055.2499**

3.3 Stage 1 Night Delivery - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.1482	11.3919	13.6271	0.0255		0.4749	0.4749		0.4546	0.4546		2,440.3794	2,440.3794	0.4367		2,451.2968
Total	**1.1482**	**11.3919**	**13.6271**	**0.0255**	**0.0000**	**0.4749**	**0.4749**	**0.0000**	**0.4546**	**0.4546**		**2,440.3794**	**2,440.3794**	**0.4367**		**2,451.2968**

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 1 Night Delivery - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.1863	0.1204	1.5160	5.1100e-003	0.6387	3.1500e-003	0.6418	0.1694	2.9000e-003	0.1723		527.0615	527.0615	0.0116	0.0127	531.1394
Total	**0.1970**	**0.5331**	**1.6657**	**6.9400e-003**	**0.6999**	**5.5400e-003**	**0.7055**	**0.1870**	**5.1900e-003**	**0.1922**		**725.2532**	**725.2532**	**0.0178**	**0.0415**	**738.0517**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.1482	11.3919	13.6271	0.0255		0.4749	0.4749		0.4546	0.4546	0.0000	2,440.3794	2,440.3794	0.4367		2,451.2968
Total	**1.1482**	**11.3919**	**13.6271**	**0.0255**	**0.0000**	**0.4749**	**0.4749**	**0.0000**	**0.4546**	**0.4546**	**0.0000**	**2,440.3794**	**2,440.3794**	**0.4367**		**2,451.2968**

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 1 Night Delivery - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.1863	0.1204	1.5160	5.1100e-003	0.6387	3.1500e-003	0.6418	0.1694	2.9000e-003	0.1723		527.0615	527.0615	0.0116	0.0127	531.1394
Total	**0.1970**	**0.5331**	**1.6657**	**6.9400e-003**	**0.6999**	**5.5400e-003**	**0.7055**	**0.1870**	**5.1900e-003**	**0.1922**		**725.2532**	**725.2532**	**0.0178**	**0.0415**	**738.0517**

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.568480	0.062094	0.174123	0.115064	0.023357	0.006399	0.009361	0.006325	0.000693	0.000596	0.028205	0.000919	0.004383

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Unmitigated	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117

Camino Del Mar Bridge Replacement Stage 1 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	9.5200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0177					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7000e-004	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**		**0.0117**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	9.5200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0177					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7000e-004	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**		**0.0117**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Camino Del Mar Bridge Replacement Stage 2

San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	50.00	1000sqft	1.15	50,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2027
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - This model is for construction impacts only.

Land Use - Land use area is approximate footprint of construction area and is not used in model calculations.

Construction Phase - Construction schedule per project engineers.

Off-road Equipment - Equipment estimate per project engineeers.
Off-Highway Trucks = concrete pump truck.
Other Construction Equipment = bidwell concrete machine.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.
Off-Highway Trucks = concrete pump truck.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.
Off-Highway Trucks = pavement striping truck.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.

Trips and VMT - Trips based on equipment estimates, stage activity and material requirements.

Architectural Coating - Traffic marking VOC content limit per SDAPCD 67.0.1, effective January 1, 2022.

Construction Off-road Equipment Mitigation - Dust mitigation to meet SDAPCD Rule 55 reuirements.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Parking	3,000.00	4,500.00
tblArchitecturalCoating	EF_Parking	250.00	100.00
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	NumDays	200.00	10.00
tblConstructionPhase	NumDays	200.00	32.00
tblConstructionPhase	NumDays	200.00	11.00
tblConstructionPhase	NumDays	200.00	50.00
tblConstructionPhase	NumDays	200.00	27.00
tblConstructionPhase	NumDays	200.00	30.00
tblConstructionPhase	NumDays	200.00	4.00
tblConstructionPhase	NumDays	200.00	30.00
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	NumDays	10.00	4.00
tblOffRoadEquipment	HorsePower	172.00	50.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	500.00
tblTripsAndVMT	HaulingTripNumber	0.00	20.00
tblTripsAndVMT	HaulingTripNumber	0.00	260.00
tblTripsAndVMT	HaulingTripNumber	0.00	512.00
tblTripsAndVMT	HaulingTripNumber	0.00	260.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	30.00	100.00
tblTripsAndVMT	WorkerTripNumber	10.00	40.00
tblTripsAndVMT	WorkerTripNumber	4.00	20.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblTripsAndVMT	WorkerTripNumber	21.00	50.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00

2.0 Emissions Summary

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.2149	1.7862	2.3594	4.8900e-003	0.0755	0.0754	0.1510	0.0202	0.0723	0.0925	0.0000	429.4520	429.4520	0.0691	5.0100e-003	432.6722
2025	0.1493	1.1480	1.4155	3.4600e-003	0.0612	0.0436	0.1048	0.0164	0.0416	0.0580	0.0000	307.2444	307.2444	0.0486	7.0900e-003	310.5734
Maximum	**0.2149**	**1.7862**	**2.3594**	**4.8900e-003**	**0.0755**	**0.0754**	**0.1510**	**0.0202**	**0.0723**	**0.0925**	**0.0000**	**429.4520**	**429.4520**	**0.0691**	**7.0900e-003**	**432.6722**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.2149	1.7862	2.3594	4.8900e-003	0.0755	0.0754	0.1510	0.0202	0.0723	0.0925	0.0000	429.4516	429.4516	0.0691	5.0100e-003	432.6717
2025	0.1493	1.1480	1.4155	3.4600e-003	0.0612	0.0436	0.1048	0.0164	0.0416	0.0580	0.0000	307.2441	307.2441	0.0486	7.0900e-003	310.5731
Maximum	**0.2149**	**1.7862**	**2.3594**	**4.8900e-003**	**0.0755**	**0.0754**	**0.1510**	**0.0202**	**0.0723**	**0.0925**	**0.0000**	**429.4516**	**429.4516**	**0.0691**	**7.0900e-003**	**432.6717**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**8-1-2024**	**10-31-2024**	1.2008	1.2008
2	**11-1-2024**	**1-31-2025**	1.1414	1.1414
3	**2-1-2025**	**4-30-2025**	0.7425	0.7425
4	**5-1-2025**	**7-31-2025**	0.1958	0.1958
		Highest	1.2008	1.2008

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Stage 2 Temporary Trestle	Building Construction	8/1/2024	8/14/2024	5	10	
2	Stage 2 Coffer Dams for Demo	Building Construction	8/15/2024	9/27/2024	5	32	
3	Stage 2 Bridge Demolition	Demolition	9/28/2024	10/29/2024	5	22	

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4	Stage 2 Coffer Dams for Piers	Building Construction	10/30/2024	11/13/2024	5	11	
5	Stage 2 Bridge Piers Forms and Steel	Building Construction	11/14/2024	1/22/2025	5	50	
6	Stage 2 Bridge Piers Concrete	Building Construction	1/23/2025	2/28/2025	5	27	
7	Stage 2 Bridge Deck Forms and Steel	Building Construction	3/1/2025	4/11/2025	5	30	
8	Stage 2 Night Delivery	Building Construction	3/17/2025	3/20/2025	5	4	
9	Stage 2 Bridge Deck Concrete	Building Construction	4/12/2025	5/23/2025	5	30	
10	Stage 2 Paving	Paving	5/24/2025	5/29/2025	5	4	
11	Stage 2 Pavement Marking	Architectural Coating	5/30/2025	5/30/2025	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 1.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 4,500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Stage 2 Temporary Trestle	Air Compressors	2	8.00	78	0.48
Stage 2 Temporary Trestle	Cranes	2	8.00	231	0.29
Stage 2 Temporary Trestle	Crawler Tractors	1	8.00	212	0.43
Stage 2 Temporary Trestle	Excavators	2	8.00	158	0.38
Stage 2 Temporary Trestle	Generator Sets	2	8.00	84	0.74
Stage 2 Temporary Trestle	Rough Terrain Forklifts	2	8.00	100	0.40
Stage 2 Temporary Trestle	Rubber Tired Loaders	1	8.00	203	0.36
Stage 2 Temporary Trestle	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Stage 2 Temporary Trestle	Welders	1	8.00	46	0.45
Stage 2 Coffer Dams for Demo	Air Compressors	2	8.00	78	0.48
Stage 2 Coffer Dams for Demo	Cranes	3	8.00	231	0.29

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Stage 2 Coffer Dams for Demo	Excavators	2	8.00	158	0.38
Stage 2 Coffer Dams for Demo	Generator Sets	2	8.00	84	0.74
Stage 2 Coffer Dams for Demo	Pumps	3	8.00	84	0.74
Stage 2 Coffer Dams for Demo	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 2 Coffer Dams for Demo	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Stage 2 Coffer Dams for Demo	Welders	1	8.00	46	0.45
Stage 2 Bridge Demolition	Air Compressors	2	8.00	78	0.48
Stage 2 Bridge Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Stage 2 Bridge Demolition	Cranes	2	8.00	231	0.29
Stage 2 Bridge Demolition	Excavators	2	8.00	158	0.38
Stage 2 Bridge Demolition	Generator Sets	2	8.00	84	0.74
Stage 2 Bridge Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Stage 2 Coffer Dams for Piers	Air Compressors	2	8.00	78	0.48
Stage 2 Coffer Dams for Piers	Cranes	3	6.00	231	0.29
Stage 2 Coffer Dams for Piers	Excavators	2	8.00	158	0.38
Stage 2 Coffer Dams for Piers	Generator Sets	2	8.00	84	0.74
Stage 2 Coffer Dams for Piers	Pumps	3	8.00	84	0.74
Stage 2 Coffer Dams for Piers	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 2 Coffer Dams for Piers	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Stage 2 Coffer Dams for Piers	Welders	1	8.00	46	0.45
Stage 2 Bridge Piers Forms and Steel	Air Compressors	2	8.00	78	0.48
Stage 2 Bridge Piers Forms and Steel	Bore/Drill Rigs	1	8.00	221	0.50
Stage 2 Bridge Piers Forms and Steel	Cranes	2	8.00	231	0.29
Stage 2 Bridge Piers Forms and Steel	Excavators	2	8.00	158	0.38
Stage 2 Bridge Piers Forms and Steel	Generator Sets	2	8.00	84	0.74
Stage 2 Bridge Piers Forms and Steel	Pumps	2	8.00	84	0.74
Stage 2 Bridge Piers Forms and Steel	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 2 Bridge Piers Forms and Steel	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Stage 2 Bridge Piers Forms and Steel	Welders	2	8.00	46	0.45

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Stage 2 Bridge Piers Concrete	Air Compressors	2	8.00	78	0.48
Stage 2 Bridge Piers Concrete	Cranes	2	6.00	231	0.29
Stage 2 Bridge Piers Concrete	Generator Sets	2	8.00	84	0.74
Stage 2 Bridge Piers Concrete	Off-Highway Trucks	1	8.00	402	0.38
Stage 2 Bridge Piers Concrete	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 2 Bridge Deck Forms and Steel	Air Compressors	2	8.00	78	0.48
Stage 2 Bridge Deck Forms and Steel	Cranes	2	8.00	231	0.29
Stage 2 Bridge Deck Forms and Steel	Generator Sets	2	8.00	84	0.74
Stage 2 Bridge Deck Forms and Steel	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 2 Bridge Deck Forms and Steel	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 2 Bridge Deck Forms and Steel	Welders	2	8.00	46	0.45
Stage 2 Night Delivery	Cranes	1	8.00	231	0.29
Stage 2 Night Delivery	Generator Sets	2	8.00	84	0.74
Stage 2 Night Delivery	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 2 Night Delivery	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 2 Bridge Deck Concrete	Cranes	2	8.00	231	0.29
Stage 2 Bridge Deck Concrete	Generator Sets	2	8.00	84	0.74
Stage 2 Bridge Deck Concrete	Off-Highway Trucks	1	8.00	402	0.38
Stage 2 Bridge Deck Concrete	Other Construction Equipment	1	8.00	50	0.42
Stage 2 Bridge Deck Concrete	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 2 Paving	Pavers	1	8.00	130	0.42
Stage 2 Paving	Paving Equipment	1	8.00	132	0.36
Stage 2 Paving	Rollers	1	8.00	80	0.38
Stage 2 Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 2 Pavement Marking	Air Compressors	1	8.00	78	0.48
Stage 2 Pavement Marking	Off-Highway Trucks	1	8.00	402	0.38

Trips and VMT

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Stage 2 Temporary Trestle	15	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Coffer Dams for Demo	16	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Bridge Demolition	12	100.00	10.00	500.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Coffer Dams for Piers	16	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Bridge Piers Forms and Steel	16	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Bridge Piers Concrete	8	50.00	10.00	260.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Bridge Deck Forms and Steel	10	100.00	10.00	512.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Night Delivery	5	50.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Bridge Deck Concrete	7	50.00	10.00	260.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Paving	4	40.00	10.00	20.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Pavement Marking	2	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Stage 2 Temporary Trestle - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0174	0.1610	0.1832	3.6000e-004		6.6900e-003	6.6900e-003		6.3300e-003	6.3300e-003	0.0000	31.5582	31.5582	7.4900e-003	0.0000	31.7454
Total	**0.0174**	**0.1610**	**0.1832**	**3.6000e-004**		**6.6900e-003**	**6.6900e-003**		**6.3300e-003**	**6.3300e-003**	**0.0000**	**31.5582**	**31.5582**	**7.4900e-003**	**0.0000**	**31.7454**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 2 Temporary Trestle - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	2.0500e-003	7.4000e-004	1.0000e-005	3.0000e-004	1.0000e-005	3.1000e-004	9.0000e-005	1.0000e-005	1.0000e-004	0.0000	0.8982	0.8982	3.0000e-005	1.3000e-004	0.9377
Worker	1.6700e-003	1.1800e-003	0.0152	5.0000e-005	6.2300e-003	3.0000e-005	6.2700e-003	1.6600e-003	3.0000e-005	1.6900e-003	0.0000	4.8241	4.8241	1.0000e-004	1.1000e-004	4.8607
Total	**1.7200e-003**	**3.2300e-003**	**0.0160**	**6.0000e-005**	**6.5300e-003**	**4.0000e-005**	**6.5800e-003**	**1.7500e-003**	**4.0000e-005**	**1.7900e-003**	**0.0000**	**5.7223**	**5.7223**	**1.3000e-004**	**2.4000e-004**	**5.7984**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0174	0.1610	0.1832	3.6000e-004		6.6900e-003	6.6900e-003		6.3300e-003	6.3300e-003	0.0000	31.5582	31.5582	7.4900e-003	0.0000	31.7454
Total	**0.0174**	**0.1610**	**0.1832**	**3.6000e-004**		**6.6900e-003**	**6.6900e-003**		**6.3300e-003**	**6.3300e-003**	**0.0000**	**31.5582**	**31.5582**	**7.4900e-003**	**0.0000**	**31.7454**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 2 Temporary Trestle - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	2.0500e-003	7.4000e-004	1.0000e-005	3.0000e-004	1.0000e-005	3.1000e-004	9.0000e-005	1.0000e-005	1.0000e-004	0.0000	0.8982	0.8982	3.0000e-005	1.3000e-004	0.9377
Worker	1.6700e-003	1.1800e-003	0.0152	5.0000e-005	6.2300e-003	3.0000e-005	6.2700e-003	1.6600e-003	3.0000e-005	1.6900e-003	0.0000	4.8241	4.8241	1.0000e-004	1.1000e-004	4.8607
Total	**1.7200e-003**	**3.2300e-003**	**0.0160**	**6.0000e-005**	**6.5300e-003**	**4.0000e-005**	**6.5800e-003**	**1.7500e-003**	**4.0000e-005**	**1.7900e-003**	**0.0000**	**5.7223**	**5.7223**	**1.3000e-004**	**2.4000e-004**	**5.7984**

3.3 Stage 2 Coffer Dams for Demo - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0632	0.5603	0.6975	1.2900e-003		0.0245	0.0245		0.0236	0.0236	0.0000	111.5823	111.5823	0.0198	0.0000	112.0776
Total	**0.0632**	**0.5603**	**0.6975**	**1.2900e-003**		**0.0245**	**0.0245**		**0.0236**	**0.0236**	**0.0000**	**111.5823**	**111.5823**	**0.0198**	**0.0000**	**112.0776**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 2 Coffer Dams for Demo - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.7000e-004	6.5600e-003	2.3500e-003	3.0000e-005	9.6000e-004	4.0000e-005	1.0000e-003	2.8000e-004	4.0000e-005	3.1000e-004	0.0000	2.8741	2.8741	9.0000e-005	4.2000e-004	3.0005
Worker	5.3600e-003	3.7800e-003	0.0488	1.6000e-004	0.0200	1.0000e-004	0.0201	5.3000e-003	9.0000e-005	5.3900e-003	0.0000	15.4373	15.4373	3.3000e-004	3.6000e-004	15.5542
Total	**5.5300e-003**	**0.0103**	**0.0511**	**1.9000e-004**	**0.0209**	**1.4000e-004**	**0.0211**	**5.5800e-003**	**1.3000e-004**	**5.7000e-003**	**0.0000**	**18.3113**	**18.3113**	**4.2000e-004**	**7.8000e-004**	**18.5547**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0632	0.5603	0.6975	1.2900e-003		0.0245	0.0245		0.0236	0.0236	0.0000	111.5822	111.5822	0.0198	0.0000	112.0775
Total	**0.0632**	**0.5603**	**0.6975**	**1.2900e-003**		**0.0245**	**0.0245**		**0.0236**	**0.0236**	**0.0000**	**111.5822**	**111.5822**	**0.0198**	**0.0000**	**112.0775**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 2 Coffer Dams for Demo - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.7000e-004	6.5600e-003	2.3500e-003	3.0000e-005	9.6000e-004	4.0000e-005	1.0000e-003	2.8000e-004	4.0000e-005	3.1000e-004	0.0000	2.8741	2.8741	9.0000e-005	4.2000e-004	3.0005
Worker	5.3600e-003	3.7800e-003	0.0488	1.6000e-004	0.0200	1.0000e-004	0.0201	5.3000e-003	9.0000e-005	5.3900e-003	0.0000	15.4373	15.4373	3.3000e-004	3.6000e-004	15.5542
Total	**5.5300e-003**	**0.0103**	**0.0511**	**1.9000e-004**	**0.0209**	**1.4000e-004**	**0.0211**	**5.5800e-003**	**1.3000e-004**	**5.7000e-003**	**0.0000**	**18.3113**	**18.3113**	**4.2000e-004**	**7.8000e-004**	**18.5547**

3.4 Stage 2 Bridge Demolition - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0310	0.2740	0.3585	6.4000e-004		0.0124	0.0124		0.0118	0.0118	0.0000	56.0094	56.0094	0.0110	0.0000	56.2835
Total	**0.0310**	**0.2740**	**0.3585**	**6.4000e-004**		**0.0124**	**0.0124**		**0.0118**	**0.0118**	**0.0000**	**56.0094**	**56.0094**	**0.0110**	**0.0000**	**56.2835**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Stage 2 Bridge Demolition - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.5000e-004	0.0336	9.1500e-003	1.5000e-004	4.2800e-003	2.8000e-004	4.5600e-003	1.1800e-003	2.7000e-004	1.4400e-003	0.0000	14.7396	14.7396	7.8000e-004	2.3500e-003	15.4581
Vendor	1.2000e-004	4.5100e-003	1.6200e-003	2.0000e-005	6.6000e-004	3.0000e-005	6.9000e-004	1.9000e-004	3.0000e-005	2.2000e-004	0.0000	1.9759	1.9759	6.0000e-005	2.9000e-004	2.0629
Worker	3.6800e-003	2.6000e-003	0.0335	1.1000e-004	0.0137	7.0000e-005	0.0138	3.6400e-003	6.0000e-005	3.7100e-003	0.0000	10.6131	10.6131	2.3000e-004	2.5000e-004	10.6935
Total	**4.3500e-003**	**0.0407**	**0.0443**	**2.8000e-004**	**0.0187**	**3.8000e-004**	**0.0190**	**5.0100e-003**	**3.6000e-004**	**5.3700e-003**	**0.0000**	**27.3287**	**27.3287**	**1.0700e-003**	**2.8900e-003**	**28.2145**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0310	0.2740	0.3585	6.4000e-004		0.0124	0.0124		0.0118	0.0118	0.0000	56.0093	56.0093	0.0110	0.0000	56.2834
Total	**0.0310**	**0.2740**	**0.3585**	**6.4000e-004**		**0.0124**	**0.0124**		**0.0118**	**0.0118**	**0.0000**	**56.0093**	**56.0093**	**0.0110**	**0.0000**	**56.2834**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Stage 2 Bridge Demolition - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.5000e-004	0.0336	9.1500e-003	1.5000e-004	4.2800e-003	2.8000e-004	4.5600e-003	1.1800e-003	2.7000e-004	1.4400e-003	0.0000	14.7396	14.7396	7.8000e-004	2.3500e-003	15.4581
Vendor	1.2000e-004	4.5100e-003	1.6200e-003	2.0000e-005	6.6000e-004	3.0000e-005	6.9000e-004	1.9000e-004	3.0000e-005	2.2000e-004	0.0000	1.9759	1.9759	6.0000e-005	2.9000e-004	2.0629
Worker	3.6800e-003	2.6000e-003	0.0335	1.1000e-004	0.0137	7.0000e-005	0.0138	3.6400e-003	6.0000e-005	3.7100e-003	0.0000	10.6131	10.6131	2.3000e-004	2.5000e-004	10.6935
Total	**4.3500e-003**	**0.0407**	**0.0443**	**2.8000e-004**	**0.0187**	**3.8000e-004**	**0.0190**	**5.0100e-003**	**3.6000e-004**	**5.3700e-003**	**0.0000**	**27.3287**	**27.3287**	**1.0700e-003**	**2.8900e-003**	**28.2145**

3.5 Stage 2 Coffer Dams for Piers - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0200	0.1742	0.2263	4.1000e-004		7.6500e-003	7.6500e-003		7.3800e-003	7.3800e-003	0.0000	35.5124	35.5124	5.8900e-003	0.0000	35.6597
Total	**0.0200**	**0.1742**	**0.2263**	**4.1000e-004**		**7.6500e-003**	**7.6500e-003**		**7.3800e-003**	**7.3800e-003**	**0.0000**	**35.5124**	**35.5124**	**5.8900e-003**	**0.0000**	**35.6597**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Stage 2 Coffer Dams for Piers - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0000e-005	2.2500e-003	8.1000e-004	1.0000e-005	3.3000e-004	1.0000e-005	3.4000e-004	1.0000e-004	1.0000e-005	1.1000e-004	0.0000	0.9880	0.9880	3.0000e-005	1.4000e-004	1.0314
Worker	1.8400e-003	1.3000e-003	0.0168	6.0000e-005	6.8600e-003	3.0000e-005	6.8900e-003	1.8200e-003	3.0000e-005	1.8500e-003	0.0000	5.3066	5.3066	1.1000e-004	1.3000e-004	5.3468
Total	**1.9000e-003**	**3.5500e-003**	**0.0176**	**7.0000e-005**	**7.1900e-003**	**4.0000e-005**	**7.2300e-003**	**1.9200e-003**	**4.0000e-005**	**1.9600e-003**	**0.0000**	**6.2945**	**6.2945**	**1.4000e-004**	**2.7000e-004**	**6.3782**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0200	0.1742	0.2263	4.1000e-004		7.6500e-003	7.6500e-003		7.3800e-003	7.3800e-003	0.0000	35.5124	35.5124	5.8900e-003	0.0000	35.6597
Total	**0.0200**	**0.1742**	**0.2263**	**4.1000e-004**		**7.6500e-003**	**7.6500e-003**		**7.3800e-003**	**7.3800e-003**	**0.0000**	**35.5124**	**35.5124**	**5.8900e-003**	**0.0000**	**35.6597**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Stage 2 Coffer Dams for Piers - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0000e-005	2.2500e-003	8.1000e-004	1.0000e-005	3.3000e-004	1.0000e-005	3.4000e-004	1.0000e-004	1.0000e-005	1.1000e-004	0.0000	0.9880	0.9880	3.0000e-005	1.4000e-004	1.0314
Worker	1.8400e-003	1.3000e-003	0.0168	6.0000e-005	6.8600e-003	3.0000e-005	6.8900e-003	1.8200e-003	3.0000e-005	1.8500e-003	0.0000	5.3066	5.3066	1.1000e-004	1.3000e-004	5.3468
Total	**1.9000e-003**	**3.5500e-003**	**0.0176**	**7.0000e-005**	**7.1900e-003**	**4.0000e-005**	**7.2300e-003**	**1.9200e-003**	**4.0000e-005**	**1.9600e-003**	**0.0000**	**6.2945**	**6.2945**	**1.4000e-004**	**2.7000e-004**	**6.3782**

3.6 Stage 2 Bridge Piers Forms and Steel - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0639	0.5477	0.7106	1.3700e-003		0.0235	0.0235		0.0226	0.0226	0.0000	117.6771	117.6771	0.0227	0.0000	118.2457
Total	**0.0639**	**0.5477**	**0.7106**	**1.3700e-003**		**0.0235**	**0.0235**		**0.0226**	**0.0226**	**0.0000**	**117.6771**	**117.6771**	**0.0227**	**0.0000**	**118.2457**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 2 Bridge Piers Forms and Steel - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8000e-004	6.9700e-003	2.5000e-003	3.0000e-005	1.0200e-003	4.0000e-005	1.0600e-003	2.9000e-004	4.0000e-005	3.3000e-004	0.0000	3.0537	3.0537	1.0000e-004	4.4000e-004	3.1881
Worker	5.6900e-003	4.0200e-003	0.0518	1.8000e-004	0.0212	1.1000e-004	0.0213	5.6300e-003	1.0000e-004	5.7300e-003	0.0000	16.4021	16.4021	3.5000e-004	3.9000e-004	16.5264
Total	**5.8700e-003**	**0.0110**	**0.0543**	**2.1000e-004**	**0.0222**	**1.5000e-004**	**0.0224**	**5.9200e-003**	**1.4000e-004**	**6.0600e-003**	**0.0000**	**19.4558**	**19.4558**	**4.5000e-004**	**8.3000e-004**	**19.7144**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0639	0.5477	0.7106	1.3700e-003		0.0235	0.0235		0.0226	0.0226	0.0000	117.6770	117.6770	0.0227	0.0000	118.2456
Total	**0.0639**	**0.5477**	**0.7106**	**1.3700e-003**		**0.0235**	**0.0235**		**0.0226**	**0.0226**	**0.0000**	**117.6770**	**117.6770**	**0.0227**	**0.0000**	**118.2456**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 2 Bridge Piers Forms and Steel - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8000e-004	6.9700e-003	2.5000e-003	3.0000e-005	1.0200e-003	4.0000e-005	1.0600e-003	2.9000e-004	4.0000e-005	3.3000e-004	0.0000	3.0537	3.0537	1.0000e-004	4.4000e-004	3.1881
Worker	5.6900e-003	4.0200e-003	0.0518	1.8000e-004	0.0212	1.1000e-004	0.0213	5.6300e-003	1.0000e-004	5.7300e-003	0.0000	16.4021	16.4021	3.5000e-004	3.9000e-004	16.5264
Total	**5.8700e-003**	**0.0110**	**0.0543**	**2.1000e-004**	**0.0222**	**1.5000e-004**	**0.0224**	**5.9200e-003**	**1.4000e-004**	**6.0600e-003**	**0.0000**	**19.4558**	**19.4558**	**4.5000e-004**	**8.3000e-004**	**19.7144**

3.6 Stage 2 Bridge Piers Forms and Steel - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0282	0.2399	0.3332	6.4000e-004		9.6500e-003	9.6500e-003		9.2700e-003	9.2700e-003	0.0000	55.3820	55.3820	0.0106	0.0000	55.6473
Total	**0.0282**	**0.2399**	**0.3332**	**6.4000e-004**		**9.6500e-003**	**9.6500e-003**		**9.2700e-003**	**9.2700e-003**	**0.0000**	**55.3820**	**55.3820**	**0.0106**	**0.0000**	**55.6473**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 2 Bridge Piers Forms and Steel - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	3.2500e-003	1.1600e-003	1.0000e-005	4.8000e-004	2.0000e-005	5.0000e-004	1.4000e-004	2.0000e-005	1.6000e-004	0.0000	1.4096	1.4096	5.0000e-005	2.0000e-004	1.4717
Worker	2.5300e-003	1.7100e-003	0.0229	8.0000e-005	9.9800e-003	5.0000e-005	0.0100	2.6500e-003	4.0000e-005	2.6900e-003	0.0000	7.5301	7.5301	1.5000e-004	1.7000e-004	7.5847
Total	**2.6100e-003**	**4.9600e-003**	**0.0240**	**9.0000e-005**	**0.0105**	**7.0000e-005**	**0.0105**	**2.7900e-003**	**6.0000e-005**	**2.8500e-003**	**0.0000**	**8.9397**	**8.9397**	**2.0000e-004**	**3.7000e-004**	**9.0564**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0282	0.2399	0.3332	6.4000e-004		9.6500e-003	9.6500e-003		9.2700e-003	9.2700e-003	0.0000	55.3820	55.3820	0.0106	0.0000	55.6472
Total	**0.0282**	**0.2399**	**0.3332**	**6.4000e-004**		**9.6500e-003**	**9.6500e-003**		**9.2700e-003**	**9.2700e-003**	**0.0000**	**55.3820**	**55.3820**	**0.0106**	**0.0000**	**55.6472**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 2 Bridge Piers Forms and Steel - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	3.2500e-003	1.1600e-003	1.0000e-005	4.8000e-004	2.0000e-005	5.0000e-004	1.4000e-004	2.0000e-005	1.6000e-004	0.0000	1.4096	1.4096	5.0000e-005	2.0000e-004	1.4717
Worker	2.5300e-003	1.7100e-003	0.0229	8.0000e-005	9.9800e-003	5.0000e-005	0.0100	2.6500e-003	4.0000e-005	2.6900e-003	0.0000	7.5301	7.5301	1.5000e-004	1.7000e-004	7.5847
Total	**2.6100e-003**	**4.9600e-003**	**0.0240**	**9.0000e-005**	**0.0105**	**7.0000e-005**	**0.0105**	**2.7900e-003**	**6.0000e-005**	**2.8500e-003**	**0.0000**	**8.9397**	**8.9397**	**2.0000e-004**	**3.7000e-004**	**9.0564**

3.7 Stage 2 Bridge Piers Concrete - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0279	0.2268	0.2722	6.2000e-004		9.2700e-003	9.2700e-003		8.8800e-003	8.8800e-003	0.0000	54.0897	54.0897	0.0107	0.0000	54.3560
Total	**0.0279**	**0.2268**	**0.2722**	**6.2000e-004**		**9.2700e-003**	**9.2700e-003**		**8.8800e-003**	**8.8800e-003**	**0.0000**	**54.0897**	**54.0897**	**0.0107**	**0.0000**	**54.3560**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Stage 2 Bridge Piers Concrete - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8000e-004	0.0173	4.8300e-003	7.0000e-005	2.2300e-003	1.4000e-004	2.3700e-003	6.1000e-004	1.4000e-004	7.5000e-004	0.0000	7.5092	7.5092	4.2000e-004	1.2000e-003	7.8761
Vendor	1.4000e-004	5.4800e-003	1.9500e-003	2.0000e-005	8.1000e-004	3.0000e-005	8.4000e-004	2.3000e-004	3.0000e-005	2.6000e-004	0.0000	2.3788	2.3788	8.0000e-005	3.4000e-004	2.4835
Worker	2.1300e-003	1.4400e-003	0.0193	7.0000e-005	8.4200e-003	4.0000e-005	8.4600e-003	2.2400e-003	4.0000e-005	2.2700e-003	0.0000	6.3535	6.3535	1.3000e-004	1.4000e-004	6.3996
Total	**2.5500e-003**	**0.0242**	**0.0261**	**1.6000e-004**	**0.0115**	**2.1000e-004**	**0.0117**	**3.0800e-003**	**2.1000e-004**	**3.2800e-003**	**0.0000**	**16.2415**	**16.2415**	**6.3000e-004**	**1.6800e-003**	**16.7591**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0279	0.2268	0.2722	6.2000e-004		9.2700e-003	9.2700e-003		8.8800e-003	8.8800e-003	0.0000	54.0896	54.0896	0.0107	0.0000	54.3559
Total	**0.0279**	**0.2268**	**0.2722**	**6.2000e-004**		**9.2700e-003**	**9.2700e-003**		**8.8800e-003**	**8.8800e-003**	**0.0000**	**54.0896**	**54.0896**	**0.0107**	**0.0000**	**54.3559**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Stage 2 Bridge Piers Concrete - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8000e-004	0.0173	4.8300e-003	7.0000e-005	2.2300e-003	1.4000e-004	2.3700e-003	6.1000e-004	1.4000e-004	7.5000e-004	0.0000	7.5092	7.5092	4.2000e-004	1.2000e-003	7.8761
Vendor	1.4000e-004	5.4800e-003	1.9500e-003	2.0000e-005	8.1000e-004	3.0000e-005	8.4000e-004	2.3000e-004	3.0000e-005	2.6000e-004	0.0000	2.3788	2.3788	8.0000e-005	3.4000e-004	2.4835
Worker	2.1300e-003	1.4400e-003	0.0193	7.0000e-005	8.4200e-003	4.0000e-005	8.4600e-003	2.2400e-003	4.0000e-005	2.2700e-003	0.0000	6.3535	6.3535	1.3000e-004	1.4000e-004	6.3996
Total	**2.5500e-003**	**0.0242**	**0.0261**	**1.6000e-004**	**0.0115**	**2.1000e-004**	**0.0117**	**3.0800e-003**	**2.1000e-004**	**3.2800e-003**	**0.0000**	**16.2415**	**16.2415**	**6.3000e-004**	**1.6800e-003**	**16.7591**

3.8 Stage 2 Bridge Deck Forms and Steel - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0342	0.2923	0.3515	6.6000e-004		0.0115	0.0115		0.0111	0.0111	0.0000	56.6761	56.6761	9.4400e-003	0.0000	56.9120
Total	**0.0342**	**0.2923**	**0.3515**	**6.6000e-004**		**0.0115**	**0.0115**		**0.0111**	**0.0111**	**0.0000**	**56.6761**	**56.6761**	**9.4400e-003**	**0.0000**	**56.9120**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.8 Stage 2 Bridge Deck Forms and Steel - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.5000e-004	0.0340	9.5000e-003	1.5000e-004	4.3800e-003	2.9000e-004	4.6700e-003	1.2000e-003	2.7000e-004	1.4800e-003	0.0000	14.7874	14.7874	8.2000e-004	2.3600e-003	15.5098
Vendor	1.6000e-004	6.0900e-003	2.1700e-003	3.0000e-005	9.0000e-004	4.0000e-005	9.4000e-004	2.6000e-004	3.0000e-005	2.9000e-004	0.0000	2.6431	2.6431	9.0000e-005	3.8000e-004	2.7594
Worker	4.7400e-003	3.2000e-003	0.0428	1.5000e-004	0.0187	9.0000e-005	0.0188	4.9700e-003	8.0000e-005	5.0500e-003	0.0000	14.1188	14.1188	2.8000e-004	3.2000e-004	14.2213
Total	**5.4500e-003**	**0.0433**	**0.0545**	**3.3000e-004**	**0.0240**	**4.2000e-004**	**0.0244**	**6.4300e-003**	**3.8000e-004**	**6.8200e-003**	**0.0000**	**31.5493**	**31.5493**	**1.1900e-003**	**3.0600e-003**	**32.4905**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0342	0.2923	0.3515	6.6000e-004		0.0115	0.0115		0.0111	0.0111	0.0000	56.6760	56.6760	9.4400e-003	0.0000	56.9119
Total	**0.0342**	**0.2923**	**0.3515**	**6.6000e-004**		**0.0115**	**0.0115**		**0.0111**	**0.0111**	**0.0000**	**56.6760**	**56.6760**	**9.4400e-003**	**0.0000**	**56.9119**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.8 Stage 2 Bridge Deck Forms and Steel - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.5000e-004	0.0340	9.5000e-003	1.5000e-004	4.3800e-003	2.9000e-004	4.6700e-003	1.2000e-003	2.7000e-004	1.4800e-003	0.0000	14.7874	14.7874	8.2000e-004	2.3600e-003	15.5098
Vendor	1.6000e-004	6.0900e-003	2.1700e-003	3.0000e-005	9.0000e-004	4.0000e-005	9.4000e-004	2.6000e-004	3.0000e-005	2.9000e-004	0.0000	2.6431	2.6431	9.0000e-005	3.8000e-004	2.7594
Worker	4.7400e-003	3.2000e-003	0.0428	1.5000e-004	0.0187	9.0000e-005	0.0188	4.9700e-003	8.0000e-005	5.0500e-003	0.0000	14.1188	14.1188	2.8000e-004	3.2000e-004	14.2213
Total	**5.4500e-003**	**0.0433**	**0.0545**	**3.3000e-004**	**0.0240**	**4.2000e-004**	**0.0244**	**6.4300e-003**	**3.8000e-004**	**6.8200e-003**	**0.0000**	**31.5493**	**31.5493**	**1.1900e-003**	**3.0600e-003**	**32.4905**

3.9 Stage 2 Night Delivery - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.1500e-003	0.0212	0.0271	5.0000e-005		8.3000e-004	8.3000e-004		8.0000e-004	8.0000e-004	0.0000	4.4283	4.4283	7.8000e-004	0.0000	4.4479
Total	**2.1500e-003**	**0.0212**	**0.0271**	**5.0000e-005**		**8.3000e-004**	**8.3000e-004**		**8.0000e-004**	**8.0000e-004**	**0.0000**	**4.4283**	**4.4283**	**7.8000e-004**	**0.0000**	**4.4479**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.9 Stage 2 Night Delivery - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	8.1000e-004	2.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.3524	0.3524	1.0000e-005	5.0000e-005	0.3679
Worker	3.2000e-004	2.1000e-004	2.8600e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	0.9413	0.9413	2.0000e-005	2.0000e-005	0.9481
Total	**3.4000e-004**	**1.0200e-003**	**3.1500e-003**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3700e-003**	**3.6000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.2937**	**1.2937**	**3.0000e-005**	**7.0000e-005**	**1.3160**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.1500e-003	0.0212	0.0271	5.0000e-005		8.3000e-004	8.3000e-004		8.0000e-004	8.0000e-004	0.0000	4.4283	4.4283	7.8000e-004	0.0000	4.4479
Total	**2.1500e-003**	**0.0212**	**0.0271**	**5.0000e-005**		**8.3000e-004**	**8.3000e-004**		**8.0000e-004**	**8.0000e-004**	**0.0000**	**4.4283**	**4.4283**	**7.8000e-004**	**0.0000**	**4.4479**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.9 Stage 2 Night Delivery - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	8.1000e-004	2.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.3524	0.3524	1.0000e-005	5.0000e-005	0.3679
Worker	3.2000e-004	2.1000e-004	2.8600e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	0.9413	0.9413	2.0000e-005	2.0000e-005	0.9481
Total	**3.4000e-004**	**1.0200e-003**	**3.1500e-003**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3700e-003**	**3.6000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.2937**	**1.2937**	**3.0000e-005**	**7.0000e-005**	**1.3160**

3.10 Stage 2 Bridge Deck Concrete - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0307	0.2538	0.2702	6.5000e-004		0.0107	0.0107		0.0101	0.0101	0.0000	56.3548	56.3548	0.0134	0.0000	56.6890
Total	**0.0307**	**0.2538**	**0.2702**	**6.5000e-004**		**0.0107**	**0.0107**		**0.0101**	**0.0101**	**0.0000**	**56.3548**	**56.3548**	**0.0134**	**0.0000**	**56.6890**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.10 Stage 2 Bridge Deck Concrete - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8000e-004	0.0173	4.8300e-003	7.0000e-005	2.2300e-003	1.4000e-004	2.3700e-003	6.1000e-004	1.4000e-004	7.5000e-004	0.0000	7.5092	7.5092	4.2000e-004	1.2000e-003	7.8761
Vendor	1.6000e-004	6.0900e-003	2.1700e-003	3.0000e-005	9.0000e-004	4.0000e-005	9.4000e-004	2.6000e-004	3.0000e-005	2.9000e-004	0.0000	2.6431	2.6431	9.0000e-005	3.8000e-004	2.7594
Worker	2.3700e-003	1.6000e-003	0.0214	7.0000e-005	9.3500e-003	5.0000e-005	9.4000e-003	2.4800e-003	4.0000e-005	2.5300e-003	0.0000	7.0594	7.0594	1.4000e-004	1.6000e-004	7.1107
Total	**2.8100e-003**	**0.0249**	**0.0284**	**1.7000e-004**	**0.0125**	**2.3000e-004**	**0.0127**	**3.3500e-003**	**2.1000e-004**	**3.5700e-003**	**0.0000**	**17.2117**	**17.2117**	**6.5000e-004**	**1.7400e-003**	**17.7461**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0307	0.2538	0.2702	6.5000e-004		0.0107	0.0107		0.0101	0.0101	0.0000	56.3547	56.3547	0.0134	0.0000	56.6889
Total	**0.0307**	**0.2538**	**0.2702**	**6.5000e-004**		**0.0107**	**0.0107**		**0.0101**	**0.0101**	**0.0000**	**56.3547**	**56.3547**	**0.0134**	**0.0000**	**56.6889**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.10 Stage 2 Bridge Deck Concrete - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8000e-004	0.0173	4.8300e-003	7.0000e-005	2.2300e-003	1.4000e-004	2.3700e-003	6.1000e-004	1.4000e-004	7.5000e-004	0.0000	7.5092	7.5092	4.2000e-004	1.2000e-003	7.8761
Vendor	1.6000e-004	6.0900e-003	2.1700e-003	3.0000e-005	9.0000e-004	4.0000e-005	9.4000e-004	2.6000e-004	3.0000e-005	2.9000e-004	0.0000	2.6431	2.6431	9.0000e-005	3.8000e-004	2.7594
Worker	2.3700e-003	1.6000e-003	0.0214	7.0000e-005	9.3500e-003	5.0000e-005	9.4000e-003	2.4800e-003	4.0000e-005	2.5300e-003	0.0000	7.0594	7.0594	1.4000e-004	1.6000e-004	7.1107
Total	**2.8100e-003**	**0.0249**	**0.0284**	**1.7000e-004**	**0.0125**	**2.3000e-004**	**0.0127**	**3.3500e-003**	**2.1000e-004**	**3.5700e-003**	**0.0000**	**17.2117**	**17.2117**	**6.5000e-004**	**1.7400e-003**	**17.7461**

3.11 Stage 2 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1800e-003	0.0113	0.0190	3.0000e-005		5.3000e-004	5.3000e-004		4.8000e-004	4.8000e-004	0.0000	2.5500	2.5500	8.2000e-004	0.0000	2.5706
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1800e-003**	**0.0113**	**0.0190**	**3.0000e-005**		**5.3000e-004**	**5.3000e-004**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**2.5500**	**2.5500**	**8.2000e-004**	**0.0000**	**2.5706**

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3.11 Stage 2 Paving - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	1.3300e-003	3.7000e-004	1.0000e-005	1.7000e-004	1.0000e-005	1.8000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.5776	0.5776	3.0000e-005	9.0000e-005	0.6059
Vendor	2.0000e-005	8.1000e-004	2.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.3524	0.3524	1.0000e-005	5.0000e-005	0.3679
Worker	2.5000e-004	1.7000e-004	2.2800e-003	1.0000e-005	1.0000e-003	0.0000	1.0000e-003	2.7000e-004	0.0000	2.7000e-004	0.0000	0.7530	0.7530	2.0000e-005	2.0000e-005	0.7585
Total	**2.9000e-004**	**2.3100e-003**	**2.9400e-003**	**2.0000e-005**	**1.2900e-003**	**1.0000e-005**	**1.3000e-003**	**3.5000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.6830**	**1.6830**	**6.0000e-005**	**1.6000e-004**	**1.7322**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1800e-003	0.0113	0.0190	3.0000e-005		5.3000e-004	5.3000e-004		4.8000e-004	4.8000e-004	0.0000	2.5500	2.5500	8.2000e-004	0.0000	2.5706
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1800e-003**	**0.0113**	**0.0190**	**3.0000e-005**		**5.3000e-004**	**5.3000e-004**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**2.5500**	**2.5500**	**8.2000e-004**	**0.0000**	**2.5706**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.11 Stage 2 Paving - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	1.3300e-003	3.7000e-004	1.0000e-005	1.7000e-004	1.0000e-005	1.8000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.5776	0.5776	3.0000e-005	9.0000e-005	0.6059
Vendor	2.0000e-005	8.1000e-004	2.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.3524	0.3524	1.0000e-005	5.0000e-005	0.3679
Worker	2.5000e-004	1.7000e-004	2.2800e-003	1.0000e-005	1.0000e-003	0.0000	1.0000e-003	2.7000e-004	0.0000	2.7000e-004	0.0000	0.7530	0.7530	2.0000e-005	2.0000e-005	0.7585
Total	**2.9000e-004**	**2.3100e-003**	**2.9400e-003**	**2.0000e-005**	**1.2900e-003**	**1.0000e-005**	**1.3000e-003**	**3.5000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.6830**	**1.6830**	**6.0000e-005**	**1.6000e-004**	**1.7322**

3.12 Stage 2 Pavement Marking - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0104					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5000e-004	2.2000e-003	2.8000e-003	1.0000e-005		9.0000e-005	9.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.7507	0.7507	2.0000e-004	0.0000	0.7556
Total	**0.0108**	**2.2000e-003**	**2.8000e-003**	**1.0000e-005**		**9.0000e-005**	**9.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.7507**	**0.7507**	**2.0000e-004**	**0.0000**	**0.7556**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.12 Stage 2 Pavement Marking - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.9000e-004	0.0000	1.2000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0941	0.0941	0.0000	0.0000	0.0948
Total	**3.0000e-005**	**2.0000e-005**	**2.9000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0941**	**0.0941**	**0.0000**	**0.0000**	**0.0948**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0104					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5000e-004	2.2000e-003	2.8000e-003	1.0000e-005		9.0000e-005	9.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.7507	0.7507	2.0000e-004	0.0000	0.7556
Total	**0.0108**	**2.2000e-003**	**2.8000e-003**	**1.0000e-005**		**9.0000e-005**	**9.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.7507**	**0.7507**	**2.0000e-004**	**0.0000**	**0.7556**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.12 Stage 2 Pavement Marking - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.9000e-004	0.0000	1.2000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0941	0.0941	0.0000	0.0000	0.0948
Total	**3.0000e-005**	**2.0000e-005**	**2.9000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0941**	**0.0941**	**0.0000**	**0.0000**	**0.0948**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.568480	0.062094	0.174123	0.115064	0.023357	0.006399	0.009361	0.006325	0.000693	0.000596	0.028205	0.000919	0.004383

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Unmitigated	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Camino Del Mar Bridge Replacement Stage 2

San Diego County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	50.00	1000sqft	1.15	50,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2027
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - This model is for construction impacts only.

Land Use - Land use area is approximate footprint of construction area and is not used in model calculations.

Construction Phase - Construction schedule per project engineers.

Off-road Equipment - Equipment estimate per project engineeers.
Off-Highway Trucks = concrete pump truck.
Other Construction Equipment = bidwell concrete machine.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.
Off-Highway Trucks = concrete pump truck.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.
Off-Highway Trucks = pavement striping truck.

Off-road Equipment - Equipment estimate per project engineeers.

Off-road Equipment - Equipment estimate per project engineeers.

Trips and VMT - Trips based on equipment estimates, stage activity and material requirements.

Architectural Coating - Traffic marking VOC content limit per SDAPCD 67.0.1, effective January 1, 2022.

Construction Off-road Equipment Mitigation - Dust mitigation to meet SDAPCD Rule 55 reuirements.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Parking	3,000.00	4,500.00
tblArchitecturalCoating	EF_Parking	250.00	100.00
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	NumDays	200.00	10.00
tblConstructionPhase	NumDays	200.00	32.00
tblConstructionPhase	NumDays	200.00	11.00
tblConstructionPhase	NumDays	200.00	50.00
tblConstructionPhase	NumDays	200.00	27.00
tblConstructionPhase	NumDays	200.00	30.00
tblConstructionPhase	NumDays	200.00	4.00
tblConstructionPhase	NumDays	200.00	30.00
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	NumDays	10.00	4.00
tblOffRoadEquipment	HorsePower	172.00	50.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	500.00
tblTripsAndVMT	HaulingTripNumber	0.00	20.00
tblTripsAndVMT	HaulingTripNumber	0.00	260.00
tblTripsAndVMT	HaulingTripNumber	0.00	512.00
tblTripsAndVMT	HaulingTripNumber	0.00	260.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	30.00	100.00
tblTripsAndVMT	WorkerTripNumber	10.00	40.00
tblTripsAndVMT	WorkerTripNumber	4.00	20.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblTripsAndVMT	WorkerTripNumber	21.00	50.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00

2.0 Emissions Summary

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	4.3349	35.6744	46.7741	0.0928	1.7361	1.5416	2.8938	0.4653	1.4811	1.8374	0.0000	8,939.7158	8,939.7158	1.6806	0.2894	8,990.7173
2025	21.6334	33.4784	44.6396	0.0980	2.3370	1.2178	3.5548	0.6252	1.1693	1.7945	0.0000	9,624.3810	9,624.3810	1.4894	0.2653	9,734.1934
Maximum	**21.6334**	**35.6744**	**46.7741**	**0.0980**	**2.3370**	**1.5416**	**3.5548**	**0.6252**	**1.4811**	**1.8374**	**0.0000**	**9,624.3810**	**9,624.3810**	**1.6806**	**0.2894**	**9,734.1934**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	4.3349	35.6744	46.7741	0.0928	1.7361	1.5416	2.8938	0.4653	1.4811	1.8374	0.0000	8,939.7158	8,939.7158	1.6806	0.2894	8,990.7172
2025	21.6334	33.4784	44.6396	0.0980	2.3370	1.2178	3.5548	0.6252	1.1693	1.7945	0.0000	9,624.3810	9,624.3810	1.4894	0.2653	9,734.1934
Maximum	**21.6334**	**35.6744**	**46.7741**	**0.0980**	**2.3370**	**1.5416**	**3.5548**	**0.6252**	**1.4811**	**1.8374**	**0.0000**	**9,624.3810**	**9,624.3810**	**1.6806**	**0.2894**	**9,734.1934**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**	**0.0000**	**0.0117**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**	**0.0000**	**0.0117**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Stage 2 Temporary Trestle	Building Construction	8/1/2024	8/14/2024	5	10	
2	Stage 2 Coffer Dams for Demo	Building Construction	8/15/2024	9/27/2024	5	32	
3	Stage 2 Bridge Demolition	Demolition	9/28/2024	10/29/2024	5	22	
4	Stage 2 Coffer Dams for Piers	Building Construction	10/30/2024	11/13/2024	5	11	
5	Stage 2 Bridge Piers Forms and Steel	Building Construction	11/14/2024	1/22/2025	5	50	
6	Stage 2 Bridge Piers Concrete	Building Construction	1/23/2025	2/28/2025	5	27	
7	Stage 2 Bridge Deck Forms and Steel	Building Construction	3/1/2025	4/11/2025	5	30	
8	Stage 2 Night Delivery	Building Construction	3/17/2025	3/20/2025	5	4	
9	Stage 2 Bridge Deck Concrete	Building Construction	4/12/2025	5/23/2025	5	30	
10	Stage 2 Paving	Paving	5/24/2025	5/29/2025	5	4	
11	Stage 2 Pavement Marking	Architectural Coating	5/30/2025	5/30/2025	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 1.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 4,500 (Architectural Coating – sqft)

OffRoad Equipment

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Stage 2 Temporary Trestle	Air Compressors	2	8.00	78	0.48
Stage 2 Temporary Trestle	Cranes	2	8.00	231	0.29
Stage 2 Temporary Trestle	Crawler Tractors	1	8.00	212	0.43
Stage 2 Temporary Trestle	Excavators	2	8.00	158	0.38
Stage 2 Temporary Trestle	Generator Sets	2	8.00	84	0.74
Stage 2 Temporary Trestle	Rough Terrain Forklifts	2	8.00	100	0.40
Stage 2 Temporary Trestle	Rubber Tired Loaders	1	8.00	203	0.36
Stage 2 Temporary Trestle	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Stage 2 Temporary Trestle	Welders	1	8.00	46	0.45
Stage 2 Coffer Dams for Demo	Air Compressors	2	8.00	78	0.48
Stage 2 Coffer Dams for Demo	Cranes	3	8.00	231	0.29
Stage 2 Coffer Dams for Demo	Excavators	2	8.00	158	0.38
Stage 2 Coffer Dams for Demo	Generator Sets	2	8.00	84	0.74
Stage 2 Coffer Dams for Demo	Pumps	3	8.00	84	0.74
Stage 2 Coffer Dams for Demo	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 2 Coffer Dams for Demo	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Stage 2 Coffer Dams for Demo	Welders	1	8.00	46	0.45
Stage 2 Bridge Demolition	Air Compressors	2	8.00	78	0.48
Stage 2 Bridge Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Stage 2 Bridge Demolition	Cranes	2	8.00	231	0.29
Stage 2 Bridge Demolition	Excavators	2	8.00	158	0.38
Stage 2 Bridge Demolition	Generator Sets	2	8.00	84	0.74
Stage 2 Bridge Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Stage 2 Coffer Dams for Piers	Air Compressors	2	8.00	78	0.48
Stage 2 Coffer Dams for Piers	Cranes	3	6.00	231	0.29
Stage 2 Coffer Dams for Piers	Excavators	2	8.00	158	0.38
Stage 2 Coffer Dams for Piers	Generator Sets	2	8.00	84	0.74
Stage 2 Coffer Dams for Piers	Pumps	3	8.00	84	0.74

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Stage 2 Coffer Dams for Piers	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 2 Coffer Dams for Piers	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Stage 2 Coffer Dams for Piers	Welders	1	8.00	46	0.45
Stage 2 Bridge Piers Forms and Steel	Air Compressors	2	8.00	78	0.48
Stage 2 Bridge Piers Forms and Steel	Bore/Drill Rigs	1	8.00	221	0.50
Stage 2 Bridge Piers Forms and Steel	Cranes	2	8.00	231	0.29
Stage 2 Bridge Piers Forms and Steel	Excavators	2	8.00	158	0.38
Stage 2 Bridge Piers Forms and Steel	Generator Sets	2	8.00	84	0.74
Stage 2 Bridge Piers Forms and Steel	Pumps	2	8.00	84	0.74
Stage 2 Bridge Piers Forms and Steel	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 2 Bridge Piers Forms and Steel	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Stage 2 Bridge Piers Forms and Steel	Welders	2	8.00	46	0.45
Stage 2 Bridge Piers Concrete	Air Compressors	2	8.00	78	0.48
Stage 2 Bridge Piers Concrete	Cranes	2	6.00	231	0.29
Stage 2 Bridge Piers Concrete	Generator Sets	2	8.00	84	0.74
Stage 2 Bridge Piers Concrete	Off-Highway Trucks	1	8.00	402	0.38
Stage 2 Bridge Piers Concrete	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 2 Bridge Deck Forms and Steel	Air Compressors	2	8.00	78	0.48
Stage 2 Bridge Deck Forms and Steel	Cranes	2	8.00	231	0.29
Stage 2 Bridge Deck Forms and Steel	Generator Sets	2	8.00	84	0.74
Stage 2 Bridge Deck Forms and Steel	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 2 Bridge Deck Forms and Steel	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 2 Bridge Deck Forms and Steel	Welders	2	8.00	46	0.45
Stage 2 Night Delivery	Cranes	1	8.00	231	0.29
Stage 2 Night Delivery	Generator Sets	2	8.00	84	0.74
Stage 2 Night Delivery	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 2 Night Delivery	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 2 Bridge Deck Concrete	Cranes	2	8.00	231	0.29
Stage 2 Bridge Deck Concrete	Generator Sets	2	8.00	84	0.74

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Stage 2 Bridge Deck Concrete	Off-Highway Trucks	1	8.00	402	0.38
Stage 2 Bridge Deck Concrete	Other Construction Equipment	1	8.00	50	0.42
Stage 2 Bridge Deck Concrete	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 2 Paving	Pavers	1	8.00	130	0.42
Stage 2 Paving	Paving Equipment	1	8.00	132	0.36
Stage 2 Paving	Rollers	1	8.00	80	0.38
Stage 2 Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 2 Pavement Marking	Air Compressors	1	8.00	78	0.48
Stage 2 Pavement Marking	Off-Highway Trucks	1	8.00	402	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Stage 2 Temporary Trestle	15	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Coffer Dams for Demo	16	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Bridge Demolition	12	100.00	10.00	500.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Coffer Dams for Piers	16	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Bridge Piers Forms and Steel	16	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Bridge Piers Concrete	8	50.00	10.00	260.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Bridge Deck Forms and Steel	10	100.00	10.00	512.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Night Delivery	5	50.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Bridge Deck Concrete	7	50.00	10.00	260.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Paving	4	40.00	10.00	20.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 2 Pavement Marking	2	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 2 Temporary Trestle - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.4827	32.2071	36.6459	0.0727		1.3385	1.3385		1.2660	1.2660		6,957.3913	6,957.3913	1.6512		6,998.6710
Total	**3.4827**	**32.2071**	**36.6459**	**0.0727**		**1.3385**	**1.3385**		**1.2660**	**1.2660**		**6,957.3913**	**6,957.3913**	**1.6512**		**6,998.6710**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.3727	0.2408	3.0321	0.0102	1.2773	6.3100e-003	1.2836	0.3387	5.8000e-003	0.3445		1,054.1229	1,054.1229	0.0232	0.0254	1,062.2787
Total	**0.3833**	**0.6535**	**3.1817**	**0.0121**	**1.3386**	**8.7000e-003**	**1.3473**	**0.3564**	**8.0900e-003**	**0.3645**		**1,252.3147**	**1,252.3147**	**0.0294**	**0.0542**	**1,269.1910**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 2 Temporary Trestle - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.4827	32.2071	36.6459	0.0727		1.3385	1.3385		1.2660	1.2660	0.0000	6,957.3913	6,957.3913	1.6512		6,998.6710
Total	**3.4827**	**32.2071**	**36.6459**	**0.0727**		**1.3385**	**1.3385**		**1.2660**	**1.2660**	**0.0000**	**6,957.3913**	**6,957.3913**	**1.6512**		**6,998.6710**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.3727	0.2408	3.0321	0.0102	1.2773	6.3100e-003	1.2836	0.3387	5.8000e-003	0.3445		1,054.1229	1,054.1229	0.0232	0.0254	1,062.2787
Total	**0.3833**	**0.6535**	**3.1817**	**0.0121**	**1.3386**	**8.7000e-003**	**1.3473**	**0.3564**	**8.0900e-003**	**0.3645**		**1,252.3147**	**1,252.3147**	**0.0294**	**0.0542**	**1,269.1910**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 2 Coffer Dams for Demo - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.9516	35.0209	43.5923	0.0807		1.5329	1.5329		1.4730	1.4730		7,687.4012	7,687.4012	1.3650		7,721.5262
Total	**3.9516**	**35.0209**	**43.5923**	**0.0807**		**1.5329**	**1.5329**		**1.4730**	**1.4730**		**7,687.4012**	**7,687.4012**	**1.3650**		**7,721.5262**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.3727	0.2408	3.0321	0.0102	1.2773	6.3100e-003	1.2836	0.3387	5.8000e-003	0.3445		1,054.1229	1,054.1229	0.0232	0.0254	1,062.2787
Total	**0.3833**	**0.6535**	**3.1817**	**0.0121**	**1.3386**	**8.7000e-003**	**1.3473**	**0.3564**	**8.0900e-003**	**0.3645**		**1,252.3147**	**1,252.3147**	**0.0294**	**0.0542**	**1,269.1910**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 2 Coffer Dams for Demo - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.9516	35.0209	43.5923	0.0807		1.5329	1.5329		1.4730	1.4730	0.0000	7,687.4012	7,687.4012	1.3650		7,721.5262
Total	**3.9516**	**35.0209**	**43.5923**	**0.0807**		**1.5329**	**1.5329**		**1.4730**	**1.4730**	**0.0000**	**7,687.4012**	**7,687.4012**	**1.3650**		**7,721.5262**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.3727	0.2408	3.0321	0.0102	1.2773	6.3100e-003	1.2836	0.3387	5.8000e-003	0.3445		1,054.1229	1,054.1229	0.0232	0.0254	1,062.2787
Total	**0.3833**	**0.6535**	**3.1817**	**0.0121**	**1.3386**	**8.7000e-003**	**1.3473**	**0.3564**	**8.0900e-003**	**0.3645**		**1,252.3147**	**1,252.3147**	**0.0294**	**0.0542**	**1,269.1910**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Stage 2 Bridge Demolition - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8208	24.9125	32.5912	0.0586		1.1236	1.1236		1.0733	1.0733		5,612.7076	5,612.7076	1.0987		5,640.1749
Total	**2.8208**	**24.9125**	**32.5912**	**0.0586**		**1.1236**	**1.1236**		**1.0733**	**1.0733**		**5,612.7076**	**5,612.7076**	**1.0987**		**5,640.1749**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0478	3.0663	0.8382	0.0133	0.3975	0.0254	0.4229	0.1090	0.0243	0.1333		1,477.9065	1,477.9065	0.0779	0.2352	1,549.9459
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.3727	0.2408	3.0321	0.0102	1.2773	6.3100e-003	1.2836	0.3387	5.8000e-003	0.3445		1,054.1229	1,054.1229	0.0232	0.0254	1,062.2787
Total	**0.4311**	**3.7198**	**4.0200**	**0.0254**	**1.7361**	**0.0341**	**1.7702**	**0.4653**	**0.0324**	**0.4978**		**2,730.2212**	**2,730.2212**	**0.1073**	**0.2894**	**2,819.1369**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Stage 2 Bridge Demolition - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8208	24.9125	32.5912	0.0586		1.1236	1.1236		1.0733	1.0733	0.0000	5,612.7075	5,612.7075	1.0987		5,640.1749
Total	**2.8208**	**24.9125**	**32.5912**	**0.0586**		**1.1236**	**1.1236**		**1.0733**	**1.0733**	**0.0000**	**5,612.7075**	**5,612.7075**	**1.0987**		**5,640.1749**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0478	3.0663	0.8382	0.0133	0.3975	0.0254	0.4229	0.1090	0.0243	0.1333		1,477.9065	1,477.9065	0.0779	0.2352	1,549.9459
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.3727	0.2408	3.0321	0.0102	1.2773	6.3100e-003	1.2836	0.3387	5.8000e-003	0.3445		1,054.1229	1,054.1229	0.0232	0.0254	1,062.2787
Total	**0.4311**	**3.7198**	**4.0200**	**0.0254**	**1.7361**	**0.0341**	**1.7702**	**0.4653**	**0.0324**	**0.4978**		**2,730.2212**	**2,730.2212**	**0.1073**	**0.2894**	**2,819.1369**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Stage 2 Coffer Dams for Piers - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6308	31.6685	41.1435	0.0748		1.3904	1.3904		1.3418	1.3418		7,117.4123	7,117.4123	1.1807		7,146.9287
Total	**3.6308**	**31.6685**	**41.1435**	**0.0748**		**1.3904**	**1.3904**		**1.3418**	**1.3418**		**7,117.4123**	**7,117.4123**	**1.1807**		**7,146.9287**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.3727	0.2408	3.0321	0.0102	1.2773	6.3100e-003	1.2836	0.3387	5.8000e-003	0.3445		1,054.1229	1,054.1229	0.0232	0.0254	1,062.2787
Total	**0.3833**	**0.6535**	**3.1817**	**0.0121**	**1.3386**	**8.7000e-003**	**1.3473**	**0.3564**	**8.0900e-003**	**0.3645**		**1,252.3147**	**1,252.3147**	**0.0294**	**0.0542**	**1,269.1910**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Stage 2 Coffer Dams for Piers - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6308	31.6685	41.1435	0.0748		1.3904	1.3904		1.3418	1.3418	0.0000	7,117.4123	7,117.4123	1.1807		7,146.9287
Total	**3.6308**	**31.6685**	**41.1435**	**0.0748**		**1.3904**	**1.3904**		**1.3418**	**1.3418**	**0.0000**	**7,117.4123**	**7,117.4123**	**1.1807**		**7,146.9287**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.3727	0.2408	3.0321	0.0102	1.2773	6.3100e-003	1.2836	0.3387	5.8000e-003	0.3445		1,054.1229	1,054.1229	0.0232	0.0254	1,062.2787
Total	**0.3833**	**0.6535**	**3.1817**	**0.0121**	**1.3386**	**8.7000e-003**	**1.3473**	**0.3564**	**8.0900e-003**	**0.3645**		**1,252.3147**	**1,252.3147**	**0.0294**	**0.0542**	**1,269.1910**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 2 Bridge Piers Forms and Steel - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7603	32.2198	41.7999	0.0804		1.3799	1.3799		1.3266	1.3266		7,630.4003	7,630.4003	1.4747		7,667.2687
Total	**3.7603**	**32.2198**	**41.7999**	**0.0804**		**1.3799**	**1.3799**		**1.3266**	**1.3266**		**7,630.4003**	**7,630.4003**	**1.4747**		**7,667.2687**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.3727	0.2408	3.0321	0.0102	1.2773	6.3100e-003	1.2836	0.3387	5.8000e-003	0.3445		1,054.1229	1,054.1229	0.0232	0.0254	1,062.2787
Total	**0.3833**	**0.6535**	**3.1817**	**0.0121**	**1.3386**	**8.7000e-003**	**1.3473**	**0.3564**	**8.0900e-003**	**0.3645**		**1,252.3147**	**1,252.3147**	**0.0294**	**0.0542**	**1,269.1910**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 2 Bridge Piers Forms and Steel - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7603	32.2198	41.7999	0.0804		1.3799	1.3799		1.3266	1.3266	0.0000	7,630.4003	7,630.4003	1.4747		7,667.2687
Total	**3.7603**	**32.2198**	**41.7999**	**0.0804**		**1.3799**	**1.3799**		**1.3266**	**1.3266**	**0.0000**	**7,630.4003**	**7,630.4003**	**1.4747**		**7,667.2687**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.4127	0.1497	1.8300e-003	0.0613	2.3900e-003	0.0637	0.0176	2.2900e-003	0.0199		198.1918	198.1918	6.2200e-003	0.0287	206.9123
Worker	0.3727	0.2408	3.0321	0.0102	1.2773	6.3100e-003	1.2836	0.3387	5.8000e-003	0.3445		1,054.1229	1,054.1229	0.0232	0.0254	1,062.2787
Total	**0.3833**	**0.6535**	**3.1817**	**0.0121**	**1.3386**	**8.7000e-003**	**1.3473**	**0.3564**	**8.0900e-003**	**0.3645**		**1,252.3147**	**1,252.3147**	**0.0294**	**0.0542**	**1,269.1910**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 2 Bridge Piers Forms and Steel - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.5306	29.9811	41.6503	0.0804		1.2062	1.2062		1.1587	1.1587		7,631.0295	7,631.0295	1.4619		7,667.5777
Total	**3.5306**	**29.9811**	**41.6503**	**0.0804**		**1.2062**	**1.2062**		**1.1587**	**1.1587**		**7,631.0295**	**7,631.0295**	**1.4619**		**7,667.5777**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.3527	0.2173	2.8420	9.8700e-003	1.2773	6.0400e-003	1.2833	0.3387	5.5600e-003	0.3443		1,028.3870	1,028.3870	0.0211	0.0238	1,036.0095
Total	**0.3630**	**0.6261**	**2.9893**	**0.0117**	**1.3386**	**8.4200e-003**	**1.3470**	**0.3564**	**7.8400e-003**	**0.3642**		**1,222.8046**	**1,222.8046**	**0.0275**	**0.0520**	**1,238.9841**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 2 Bridge Piers Forms and Steel - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.5306	29.9811	41.6503	0.0804		1.2062	1.2062		1.1587	1.1587	0.0000	7,631.0295	7,631.0295	1.4619		7,667.5777
Total	**3.5306**	**29.9811**	**41.6503**	**0.0804**		**1.2062**	**1.2062**		**1.1587**	**1.1587**	**0.0000**	**7,631.0295**	**7,631.0295**	**1.4619**		**7,667.5777**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.3527	0.2173	2.8420	9.8700e-003	1.2773	6.0400e-003	1.2833	0.3387	5.5600e-003	0.3443		1,028.3870	1,028.3870	0.0211	0.0238	1,036.0095
Total	**0.3630**	**0.6261**	**2.9893**	**0.0117**	**1.3386**	**8.4200e-003**	**1.3470**	**0.3564**	**7.8400e-003**	**0.3642**		**1,222.8046**	**1,222.8046**	**0.0275**	**0.0520**	**1,238.9841**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Stage 2 Bridge Piers Concrete - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0674	16.7987	20.1632	0.0461		0.6866	0.6866		0.6580	0.6580		4,416.5679	4,416.5679	0.8697		4,438.3092
Total	**2.0674**	**16.7987**	**20.1632**	**0.0461**		**0.6866**	**0.6866**		**0.6580**	**0.6580**		**4,416.5679**	**4,416.5679**	**0.8697**		**4,438.3092**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0200	1.2817	0.3602	5.5200e-003	0.1684	0.0107	0.1792	0.0462	0.0103	0.0564		613.5040	613.5040	0.0341	0.0977	643.4746
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.1764	0.1087	1.4210	4.9400e-003	0.6387	3.0200e-003	0.6417	0.1694	2.7800e-003	0.1721		514.1935	514.1935	0.0105	0.0119	518.0048
Total	**0.2067**	**1.7991**	**1.9284**	**0.0123**	**0.8683**	**0.0161**	**0.8845**	**0.2332**	**0.0153**	**0.2485**		**1,322.1152**	**1,322.1152**	**0.0510**	**0.1378**	**1,364.4539**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Stage 2 Bridge Piers Concrete - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0674	16.7987	20.1632	0.0461		0.6866	0.6866		0.6580	0.6580	0.0000	4,416.5679	4,416.5679	0.8697		4,438.3092
Total	**2.0674**	**16.7987**	**20.1632**	**0.0461**		**0.6866**	**0.6866**		**0.6580**	**0.6580**	**0.0000**	**4,416.5679**	**4,416.5679**	**0.8697**		**4,438.3092**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0200	1.2817	0.3602	5.5200e-003	0.1684	0.0107	0.1792	0.0462	0.0103	0.0564		613.5040	613.5040	0.0341	0.0977	643.4746
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.1764	0.1087	1.4210	4.9400e-003	0.6387	3.0200e-003	0.6417	0.1694	2.7800e-003	0.1721		514.1935	514.1935	0.0105	0.0119	518.0048
Total	**0.2067**	**1.7991**	**1.9284**	**0.0123**	**0.8683**	**0.0161**	**0.8845**	**0.2332**	**0.0153**	**0.2485**		**1,322.1152**	**1,322.1152**	**0.0510**	**0.1378**	**1,364.4539**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.8 Stage 2 Bridge Deck Forms and Steel - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2827	19.4850	23.4348	0.0443		0.7694	0.7694		0.7406	0.7406		4,164.9786	4,164.9786	0.6935		4,182.3163
Total	**2.2827**	**19.4850**	**23.4348**	**0.0443**		**0.7694**	**0.7694**		**0.7406**	**0.7406**		**4,164.9786**	**4,164.9786**	**0.6935**		**4,182.3163**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0354	2.2715	0.6383	9.7900e-003	0.2985	0.0190	0.3175	0.0818	0.0182	0.1000		1,087.3179	1,087.3179	0.0603	0.1732	1,140.4350
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.3527	0.2173	2.8420	9.8700e-003	1.2773	6.0400e-003	1.2833	0.3387	5.5600e-003	0.3443		1,028.3870	1,028.3870	0.0211	0.0238	1,036.0095
Total	**0.3985**	**2.8977**	**3.6276**	**0.0215**	**1.6371**	**0.0274**	**1.6645**	**0.4382**	**0.0260**	**0.4642**		**2,310.1225**	**2,310.1225**	**0.0878**	**0.2252**	**2,379.4190**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.8 Stage 2 Bridge Deck Forms and Steel - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2827	19.4850	23.4348	0.0443		0.7694	0.7694		0.7406	0.7406	0.0000	4,164.9786	4,164.9786	0.6935		4,182.3163
Total	**2.2827**	**19.4850**	**23.4348**	**0.0443**		**0.7694**	**0.7694**		**0.7406**	**0.7406**	**0.0000**	**4,164.9786**	**4,164.9786**	**0.6935**		**4,182.3163**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0354	2.2715	0.6383	9.7900e-003	0.2985	0.0190	0.3175	0.0818	0.0182	0.1000		1,087.3179	1,087.3179	0.0603	0.1732	1,140.4350
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.3527	0.2173	2.8420	9.8700e-003	1.2773	6.0400e-003	1.2833	0.3387	5.5600e-003	0.3443		1,028.3870	1,028.3870	0.0211	0.0238	1,036.0095
Total	**0.3985**	**2.8977**	**3.6276**	**0.0215**	**1.6371**	**0.0274**	**1.6645**	**0.4382**	**0.0260**	**0.4642**		**2,310.1225**	**2,310.1225**	**0.0878**	**0.2252**	**2,379.4190**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.9 Stage 2 Night Delivery - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0747	10.5783	13.5707	0.0255		0.4156	0.4156		0.3976	0.3976		2,440.6688	2,440.6688	0.4324		2,451.4788
Total	**1.0747**	**10.5783**	**13.5707**	**0.0255**		**0.4156**	**0.4156**		**0.3976**	**0.3976**		**2,440.6688**	**2,440.6688**	**0.4324**		**2,451.4788**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.1764	0.1087	1.4210	4.9400e-003	0.6387	3.0200e-003	0.6417	0.1694	2.7800e-003	0.1721		514.1935	514.1935	0.0105	0.0119	518.0048
Total	**0.1867**	**0.5174**	**1.5683**	**6.7400e-003**	**0.6999**	**5.4000e-003**	**0.7053**	**0.1870**	**5.0600e-003**	**0.1921**		**708.6111**	**708.6111**	**0.0169**	**0.0401**	**720.9793**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.9 Stage 2 Night Delivery - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0747	10.5783	13.5707	0.0255		0.4156	0.4156		0.3976	0.3976	0.0000	2,440.6688	2,440.6688	0.4324		2,451.4788
Total	**1.0747**	**10.5783**	**13.5707**	**0.0255**		**0.4156**	**0.4156**		**0.3976**	**0.3976**	**0.0000**	**2,440.6688**	**2,440.6688**	**0.4324**		**2,451.4788**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.1764	0.1087	1.4210	4.9400e-003	0.6387	3.0200e-003	0.6417	0.1694	2.7800e-003	0.1721		514.1935	514.1935	0.0105	0.0119	518.0048
Total	**0.1867**	**0.5174**	**1.5683**	**6.7400e-003**	**0.6999**	**5.4000e-003**	**0.7053**	**0.1870**	**5.0600e-003**	**0.1921**		**708.6111**	**708.6111**	**0.0169**	**0.0401**	**720.9793**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.10 Stage 2 Bridge Deck Concrete - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0486	16.9227	18.0122	0.0431		0.7158	0.7158		0.6738	0.6738		4,141.3649	4,141.3649	0.9824		4,165.9260
Total	**2.0486**	**16.9227**	**18.0122**	**0.0431**		**0.7158**	**0.7158**		**0.6738**	**0.6738**		**4,141.3649**	**4,141.3649**	**0.9824**		**4,165.9260**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0180	1.1535	0.3242	4.9700e-003	0.1516	9.6600e-003	0.1613	0.0416	9.2400e-003	0.0508		552.1536	552.1536	0.0306	0.0879	579.1271
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.1764	0.1087	1.4210	4.9400e-003	0.6387	3.0200e-003	0.6417	0.1694	2.7800e-003	0.1721		514.1935	514.1935	0.0105	0.0119	518.0048
Total	**0.2047**	**1.6710**	**1.8924**	**0.0117**	**0.8515**	**0.0151**	**0.8666**	**0.2286**	**0.0143**	**0.2429**		**1,260.7648**	**1,260.7648**	**0.0476**	**0.1280**	**1,300.1064**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.10 Stage 2 Bridge Deck Concrete - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0486	16.9227	18.0122	0.0431		0.7158	0.7158		0.6738	0.6738	0.0000	4,141.3649	4,141.3649	0.9824		4,165.9260
Total	**2.0486**	**16.9227**	**18.0122**	**0.0431**		**0.7158**	**0.7158**		**0.6738**	**0.6738**	**0.0000**	**4,141.3649**	**4,141.3649**	**0.9824**		**4,165.9260**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0180	1.1535	0.3242	4.9700e-003	0.1516	9.6600e-003	0.1613	0.0416	9.2400e-003	0.0508		552.1536	552.1536	0.0306	0.0879	579.1271
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.1764	0.1087	1.4210	4.9400e-003	0.6387	3.0200e-003	0.6417	0.1694	2.7800e-003	0.1721		514.1935	514.1935	0.0105	0.0119	518.0048
Total	**0.2047**	**1.6710**	**1.8924**	**0.0117**	**0.8515**	**0.0151**	**0.8666**	**0.2286**	**0.0143**	**0.2429**		**1,260.7648**	**1,260.7648**	**0.0476**	**0.1280**	**1,300.1064**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.11 Stage 2 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5897	5.6259	9.5187	0.0145		0.2634	0.2634		0.2423	0.2423		1,405.4284	1,405.4284	0.4545		1,416.7920
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5897**	**5.6259**	**9.5187**	**0.0145**		**0.2634**	**0.2634**		**0.2423**	**0.2423**		**1,405.4284**	**1,405.4284**	**0.4545**		**1,416.7920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0104	0.6655	0.1870	2.8700e-003	0.0875	5.5700e-003	0.0930	0.0240	5.3300e-003	0.0293		318.5502	318.5502	0.0177	0.0507	334.1118
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.1411	0.0869	1.1368	3.9500e-003	0.5109	2.4100e-003	0.5133	0.1355	2.2200e-003	0.1377		411.3548	411.3548	8.4400e-003	9.5200e-003	414.4038
Total	**0.1618**	**1.1612**	**1.4711**	**8.6200e-003**	**0.6596**	**0.0104**	**0.6700**	**0.1771**	**9.8300e-003**	**0.1869**		**924.3226**	**924.3226**	**0.0325**	**0.0884**	**951.4901**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.11 Stage 2 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5897	5.6259	9.5187	0.0145		0.2634	0.2634		0.2423	0.2423	0.0000	1,405.4284	1,405.4284	0.4545		1,416.7920
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5897**	**5.6259**	**9.5187**	**0.0145**		**0.2634**	**0.2634**		**0.2423**	**0.2423**	**0.0000**	**1,405.4284**	**1,405.4284**	**0.4545**		**1,416.7920**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0104	0.6655	0.1870	2.8700e-003	0.0875	5.5700e-003	0.0930	0.0240	5.3300e-003	0.0293		318.5502	318.5502	0.0177	0.0507	334.1118
Vendor	0.0103	0.4088	0.1473	1.8000e-003	0.0613	2.3800e-003	0.0636	0.0176	2.2800e-003	0.0199		194.4177	194.4177	6.3700e-003	0.0282	202.9745
Worker	0.1411	0.0869	1.1368	3.9500e-003	0.5109	2.4100e-003	0.5133	0.1355	2.2200e-003	0.1377		411.3548	411.3548	8.4400e-003	9.5200e-003	414.4038
Total	**0.1618**	**1.1612**	**1.4711**	**8.6200e-003**	**0.6596**	**0.0104**	**0.6700**	**0.1771**	**9.8300e-003**	**0.1869**		**924.3226**	**924.3226**	**0.0325**	**0.0884**	**951.4901**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.12 Stage 2 Pavement Marking - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	20.8575					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.7054	4.3934	5.5977	0.0172		0.1711	0.1711		0.1629	0.1629		1,654.9395	1,654.9395	0.4343		1,665.7981
Total	**21.5629**	**4.3934**	**5.5977**	**0.0172**		**0.1711**	**0.1711**		**0.1629**	**0.1629**		**1,654.9395**	**1,654.9395**	**0.4343**		**1,665.7981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0706	0.0435	0.5684	1.9700e-003	0.2555	1.2100e-003	0.2567	0.0678	1.1100e-003	0.0689		205.6774	205.6774	4.2200e-003	4.7600e-003	207.2019
Total	**0.0706**	**0.0435**	**0.5684**	**1.9700e-003**	**0.2555**	**1.2100e-003**	**0.2567**	**0.0678**	**1.1100e-003**	**0.0689**		**205.6774**	**205.6774**	**4.2200e-003**	**4.7600e-003**	**207.2019**

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.12 Stage 2 Pavement Marking - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	20.8575					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.7054	4.3934	5.5977	0.0172		0.1711	0.1711		0.1629	0.1629	0.0000	1,654.9395	1,654.9395	0.4343		1,665.7981
Total	**21.5629**	**4.3934**	**5.5977**	**0.0172**		**0.1711**	**0.1711**		**0.1629**	**0.1629**	**0.0000**	**1,654.9395**	**1,654.9395**	**0.4343**		**1,665.7981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0706	0.0435	0.5684	1.9700e-003	0.2555	1.2100e-003	0.2567	0.0678	1.1100e-003	0.0689		205.6774	205.6774	4.2200e-003	4.7600e-003	207.2019
Total	**0.0706**	**0.0435**	**0.5684**	**1.9700e-003**	**0.2555**	**1.2100e-003**	**0.2567**	**0.0678**	**1.1100e-003**	**0.0689**		**205.6774**	**205.6774**	**4.2200e-003**	**4.7600e-003**	**207.2019**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.568480	0.062094	0.174123	0.115064	0.023357	0.006399	0.009361	0.006325	0.000693	0.000596	0.028205	0.000919	0.004383

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Unmitigated	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117

Camino Del Mar Bridge Replacement Stage 2 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	9.5200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0177					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7000e-004	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**		**0.0117**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	9.5200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0177					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7000e-004	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**		**0.0117**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Camino Del Mar Bridge Replacement Stage 3

San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	50.00	1000sqft	1.15	50,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2027
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - This model is for construction impacts only.

Land Use - Land use area is approximate footprint of construction area and is not used in model calculations.

Construction Phase - Construction schedule per project engineers.

Off-road Equipment - Equipment estimate per project engineers.
Off-Highway Truck = concrete pump truck.
Other Construction Equipment = bidwell concrete machine.

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.
Off-Highway Truck = concrete pump truck.

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.
Off-Highway Trucks = pavement striping truck.

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.

Trips and VMT - Trips based on equipment estimates, stage activity and material requirements.

Architectural Coating - Traffic marking VOC content limit per SDAPCD 67.0.1, effective January 1, 2022.

Construction Off-road Equipment Mitigation - Fugitive dust mitigation to meet SDAPCD Rule 55 requirements.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Parking	3,000.00	4,500.00
tblArchitecturalCoating	EF_Parking	250.00	100.00
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	NumDays	200.00	10.00
tblConstructionPhase	NumDays	200.00	32.00
tblConstructionPhase	NumDays	200.00	11.00
tblConstructionPhase	NumDays	200.00	50.00
tblConstructionPhase	NumDays	200.00	27.00
tblConstructionPhase	NumDays	200.00	30.00
tblConstructionPhase	NumDays	200.00	4.00
tblConstructionPhase	NumDays	200.00	29.00
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	NumDays	10.00	4.00
tblOffRoadEquipment	HorsePower	172.00	50.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	20.00
tblTripsAndVMT	HaulingTripNumber	0.00	500.00
tblTripsAndVMT	HaulingTripNumber	0.00	260.00
tblTripsAndVMT	HaulingTripNumber	0.00	512.00
tblTripsAndVMT	HaulingTripNumber	0.00	260.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	10.00	40.00
tblTripsAndVMT	WorkerTripNumber	4.00	20.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	30.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblTripsAndVMT	WorkerTripNumber	21.00	50.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00

2.0 Emissions Summary

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2025	0.2514	2.0641	2.8362	6.1400e-003	0.0974	0.0811	0.1786	0.0261	0.0775	0.1036	0.0000	541.0954	541.0954	0.0917	6.9100e-003	545.4480
2026	0.0840	0.5946	0.7660	1.8400e-003	0.0389	0.0221	0.0610	0.0104	0.0213	0.0317	0.0000	164.4404	164.4404	0.0219	4.9000e-003	166.4460
Maximum	**0.2514**	**2.0641**	**2.8362**	**6.1400e-003**	**0.0974**	**0.0811**	**0.1786**	**0.0261**	**0.0775**	**0.1036**	**0.0000**	**541.0954**	**541.0954**	**0.0917**	**6.9100e-003**	**545.4480**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2025	0.2514	2.0641	2.8362	6.1400e-003	0.0974	0.0811	0.1786	0.0261	0.0775	0.1036	0.0000	541.0949	541.0949	0.0917	6.9100e-003	545.4474
2026	0.0840	0.5946	0.7660	1.8400e-003	0.0389	0.0221	0.0610	0.0104	0.0213	0.0317	0.0000	164.4403	164.4403	0.0219	4.9000e-003	166.4459
Maximum	**0.2514**	**2.0641**	**2.8362**	**6.1400e-003**	**0.0974**	**0.0811**	**0.1786**	**0.0261**	**0.0775**	**0.1036**	**0.0000**	**541.0949**	**541.0949**	**0.0917**	**6.9100e-003**	**545.4474**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**6-1-2025**	**8-31-2025**	1.1162	1.1162
2	**9-1-2025**	**11-30-2025**	0.9554	0.9554
3	**12-1-2025**	**2-28-2026**	0.7403	0.7403
4	**3-1-2026**	**5-31-2026**	0.1745	0.1745
		Highest	1.1162	1.1162

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Stage 3 Temporary Trestle	Building Construction	6/1/2025	6/13/2025	5	10	
2	Stage 3 Coffer Dams for Demo	Building Construction	6/14/2025	7/29/2025	5	32	
3	Stage 3 Bridge Demolition	Demolition	7/30/2025	8/28/2025	5	22	

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4	Stage 3 Coffer Dams For Piers	Building Construction	8/29/2025	9/12/2025	5	11	
5	Stage 3 Bridge Piers Forms and Steel	Building Construction	9/13/2025	11/21/2025	5	50	
6	Stage 3 Bridge Piers Concrete	Building Construction	11/22/2025	12/30/2025	5	27	
7	Stage 3 Bridge Deck Forms and Steel	Building Construction	1/1/2026	2/11/2026	5	30	
8	Stage 3 Night Delivery	Building Construction	1/12/2026	1/15/2026	5	4	
9	Stage 3 Bridge Deck Concrete	Building Construction	2/12/2026	3/24/2026	5	29	
10	Stage 3 Paving	Paving	3/25/2026	3/30/2026	5	4	
11	Stage 3 Pavement Marking	Architectural Coating	3/31/2026	3/31/2026	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 1.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 4,500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Stage 3 Temporary Trestle	Air Compressors	2	8.00	78	0.48
Stage 3 Temporary Trestle	Cranes	2	8.00	231	0.29
Stage 3 Temporary Trestle	Crawler Tractors	1	8.00	212	0.43
Stage 3 Temporary Trestle	Excavators	2	8.00	158	0.38
Stage 3 Temporary Trestle	Generator Sets	2	8.00	84	0.74
Stage 3 Temporary Trestle	Rough Terrain Forklifts	2	8.00	100	0.40
Stage 3 Temporary Trestle	Rubber Tired Loaders	1	8.00	203	0.36
Stage 3 Temporary Trestle	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Stage 3 Temporary Trestle	Welders	1	8.00	46	0.45
Stage 3 Coffer Dams for Demo	Air Compressors	2	8.00	78	0.48
Stage 3 Coffer Dams for Demo	Cranes	3	8.00	231	0.29

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Stage 3 Coffer Dams for Demo	Excavators	2	8.00	158	0.38
Stage 3 Coffer Dams for Demo	Generator Sets	2	8.00	84	0.74
Stage 3 Coffer Dams for Demo	Pumps	3	8.00	84	0.74
Stage 3 Coffer Dams for Demo	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 3 Coffer Dams for Demo	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Stage 3 Coffer Dams for Demo	Welders	1	8.00	46	0.45
Stage 3 Bridge Demolition	Air Compressors	2	8.00	78	0.48
Stage 3 Bridge Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Stage 3 Bridge Demolition	Cranes	2	8.00	231	0.29
Stage 3 Bridge Demolition	Excavators	2	8.00	158	0.38
Stage 3 Bridge Demolition	Generator Sets	2	8.00	84	0.74
Stage 3 Bridge Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Stage 3 Coffer Dams For Piers	Air Compressors	2	8.00	78	0.48
Stage 3 Coffer Dams For Piers	Cranes	3	8.00	231	0.29
Stage 3 Coffer Dams For Piers	Excavators	2	8.00	158	0.38
Stage 3 Coffer Dams For Piers	Generator Sets	2	8.00	84	0.74
Stage 3 Coffer Dams For Piers	Pumps	3	8.00	84	0.74
Stage 3 Coffer Dams For Piers	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 3 Coffer Dams For Piers	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Stage 3 Coffer Dams For Piers	Welders	1	8.00	46	0.45
Stage 3 Bridge Piers Forms and Steel	Air Compressors	2	8.00	78	0.48
Stage 3 Bridge Piers Forms and Steel	Bore/Drill Rigs	1	8.00	221	0.50
Stage 3 Bridge Piers Forms and Steel	Cranes	2	8.00	231	0.29
Stage 3 Bridge Piers Forms and Steel	Excavators	2	8.00	158	0.38
Stage 3 Bridge Piers Forms and Steel	Generator Sets	2	8.00	84	0.74
Stage 3 Bridge Piers Forms and Steel	Rough Terrain Forklifts	2	8.00	100	0.40
Stage 3 Bridge Piers Forms and Steel	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 3 Bridge Piers Forms and Steel	Welders	2	8.00	46	0.45
Stage 3 Bridge Piers Concrete	Air Compressors	2	8.00	78	0.48

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Stage 3 Bridge Piers Concrete	Cranes	2	8.00	231	0.29
Stage 3 Bridge Piers Concrete	Generator Sets	2	8.00	84	0.74
Stage 3 Bridge Piers Concrete	Off-Highway Trucks	1	8.00	402	0.38
Stage 3 Bridge Piers Concrete	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 3 Bridge Deck Forms and Steel	Air Compressors	2	8.00	78	0.48
Stage 3 Bridge Deck Forms and Steel	Cranes	2	8.00	231	0.29
Stage 3 Bridge Deck Forms and Steel	Generator Sets	2	8.00	84	0.74
Stage 3 Bridge Deck Forms and Steel	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 3 Bridge Deck Forms and Steel	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 3 Bridge Deck Forms and Steel	Welders	2	8.00	46	0.45
Stage 3 Night Delivery	Cranes	1	8.00	231	0.29
Stage 3 Night Delivery	Generator Sets	2	8.00	84	0.74
Stage 3 Night Delivery	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 3 Night Delivery	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 3 Bridge Deck Concrete	Air Compressors	2	8.00	78	0.48
Stage 3 Bridge Deck Concrete	Generator Sets	2	8.00	84	0.74
Stage 3 Bridge Deck Concrete	Off-Highway Trucks	1	8.00	402	0.38
Stage 3 Bridge Deck Concrete	Other Construction Equipment	1	8.00	50	0.42
Stage 3 Bridge Deck Concrete	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 3 Paving	Pavers	1	8.00	130	0.42
Stage 3 Paving	Paving Equipment	1	8.00	132	0.36
Stage 3 Paving	Rollers	1	8.00	80	0.38
Stage 3 Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 3 Pavement Marking	Air Compressors	1	8.00	78	0.48
Stage 3 Pavement Marking	Off-Highway Trucks	1	8.00	402	0.38

Trips and VMT

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Stage 3 Temporary Trestle	15	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 3 Coffer Dams for Demo	16	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 3 Bridge Demolition	12	100.00	10.00	500.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 3 Coffer Dams For Piers	16	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 3 Bridge Piers Forms and Steel	14	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 3 Bridge Piers Concrete	8	50.00	10.00	260.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 3 Bridge Deck Forms and Steel	10	100.00	10.00	512.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 3 Night Delivery	5	50.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 3 Bridge Deck Concrete	7	50.00	10.00	260.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 3 Paving	4	40.00	10.00	20.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 3 Pavement Marking	2	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Stage 3 Temporary Trestle - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0161	0.1451	0.1820	3.6000e-004		5.7800e-003	5.7800e-003		5.4600e-003	5.4600e-003	0.0000	31.5602	31.5602	7.4600e-003	0.0000	31.7467
Total	**0.0161**	**0.1451**	**0.1820**	**3.6000e-004**		**5.7800e-003**	**5.7800e-003**		**5.4600e-003**	**5.4600e-003**	**0.0000**	**31.5602**	**31.5602**	**7.4600e-003**	**0.0000**	**31.7467**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 3 Temporary Trestle - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	2.0300e-003	7.2000e-004	1.0000e-005	3.0000e-004	1.0000e-005	3.1000e-004	9.0000e-005	1.0000e-005	1.0000e-004	0.0000	0.8810	0.8810	3.0000e-005	1.3000e-004	0.9198
Worker	1.5800e-003	1.0700e-003	0.0143	5.0000e-005	6.2300e-003	3.0000e-005	6.2600e-003	1.6600e-003	3.0000e-005	1.6800e-003	0.0000	4.7063	4.7063	9.0000e-005	1.1000e-004	4.7404
Total	**1.6300e-003**	**3.1000e-003**	**0.0150**	**6.0000e-005**	**6.5300e-003**	**4.0000e-005**	**6.5700e-003**	**1.7500e-003**	**4.0000e-005**	**1.7800e-003**	**0.0000**	**5.5873**	**5.5873**	**1.2000e-004**	**2.4000e-004**	**5.6602**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0161	0.1451	0.1820	3.6000e-004		5.7800e-003	5.7800e-003		5.4600e-003	5.4600e-003	0.0000	31.5602	31.5602	7.4600e-003	0.0000	31.7466
Total	**0.0161**	**0.1451**	**0.1820**	**3.6000e-004**		**5.7800e-003**	**5.7800e-003**		**5.4600e-003**	**5.4600e-003**	**0.0000**	**31.5602**	**31.5602**	**7.4600e-003**	**0.0000**	**31.7466**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 3 Temporary Trestle - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	2.0300e-003	7.2000e-004	1.0000e-005	3.0000e-004	1.0000e-005	3.1000e-004	9.0000e-005	1.0000e-005	1.0000e-004	0.0000	0.8810	0.8810	3.0000e-005	1.3000e-004	0.9198
Worker	1.5800e-003	1.0700e-003	0.0143	5.0000e-005	6.2300e-003	3.0000e-005	6.2600e-003	1.6600e-003	3.0000e-005	1.6800e-003	0.0000	4.7063	4.7063	9.0000e-005	1.1000e-004	4.7404
Total	**1.6300e-003**	**3.1000e-003**	**0.0150**	**6.0000e-005**	**6.5300e-003**	**4.0000e-005**	**6.5700e-003**	**1.7500e-003**	**4.0000e-005**	**1.7800e-003**	**0.0000**	**5.5873**	**5.5873**	**1.2000e-004**	**2.4000e-004**	**5.6602**

3.3 Stage 3 Coffer Dams for Demo - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0592	0.5179	0.6946	1.2900e-003		0.0214	0.0214		0.0206	0.0206	0.0000	111.5933	111.5933	0.0196	0.0000	112.0838
Total	**0.0592**	**0.5179**	**0.6946**	**1.2900e-003**		**0.0214**	**0.0214**		**0.0206**	**0.0206**	**0.0000**	**111.5933**	**111.5933**	**0.0196**	**0.0000**	**112.0838**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 3 Coffer Dams for Demo - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.7000e-004	6.4900e-003	2.3200e-003	3.0000e-005	9.6000e-004	4.0000e-005	1.0000e-003	2.8000e-004	4.0000e-005	3.1000e-004	0.0000	2.8193	2.8193	9.0000e-005	4.1000e-004	2.9434
Worker	5.0600e-003	3.4100e-003	0.0457	1.6000e-004	0.0200	1.0000e-004	0.0201	5.3000e-003	9.0000e-005	5.3900e-003	0.0000	15.0601	15.0601	3.0000e-004	3.4000e-004	15.1694
Total	**5.2300e-003**	**9.9000e-003**	**0.0480**	**1.9000e-004**	**0.0209**	**1.4000e-004**	**0.0211**	**5.5800e-003**	**1.3000e-004**	**5.7000e-003**	**0.0000**	**17.8794**	**17.8794**	**3.9000e-004**	**7.5000e-004**	**18.1128**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0592	0.5179	0.6946	1.2900e-003		0.0214	0.0214		0.0206	0.0206	0.0000	111.5932	111.5932	0.0196	0.0000	112.0836
Total	**0.0592**	**0.5179**	**0.6946**	**1.2900e-003**		**0.0214**	**0.0214**		**0.0206**	**0.0206**	**0.0000**	**111.5932**	**111.5932**	**0.0196**	**0.0000**	**112.0836**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 3 Coffer Dams for Demo - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.7000e-004	6.4900e-003	2.3200e-003	3.0000e-005	9.6000e-004	4.0000e-005	1.0000e-003	2.8000e-004	4.0000e-005	3.1000e-004	0.0000	2.8193	2.8193	9.0000e-005	4.1000e-004	2.9434
Worker	5.0600e-003	3.4100e-003	0.0457	1.6000e-004	0.0200	1.0000e-004	0.0201	5.3000e-003	9.0000e-005	5.3900e-003	0.0000	15.0601	15.0601	3.0000e-004	3.4000e-004	15.1694
Total	**5.2300e-003**	**9.9000e-003**	**0.0480**	**1.9000e-004**	**0.0209**	**1.4000e-004**	**0.0211**	**5.5800e-003**	**1.3000e-004**	**5.7000e-003**	**0.0000**	**17.8794**	**17.8794**	**3.9000e-004**	**7.5000e-004**	**18.1128**

3.4 Stage 3 Bridge Demolition - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0290	0.2519	0.3572	6.4000e-004		0.0107	0.0107		0.0102	0.0102	0.0000	56.0199	56.0199	0.0109	0.0000	56.2921
Total	**0.0290**	**0.2519**	**0.3572**	**6.4000e-004**		**0.0107**	**0.0107**		**0.0102**	**0.0102**	**0.0000**	**56.0199**	**56.0199**	**0.0109**	**0.0000**	**56.2921**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Stage 3 Bridge Demolition - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.4000e-004	0.0332	9.2800e-003	1.4000e-004	4.2800e-003	2.8000e-004	4.5600e-003	1.1800e-003	2.7000e-004	1.4400e-003	0.0000	14.4408	14.4408	8.0000e-004	2.3000e-003	15.1463
Vendor	1.2000e-004	4.4600e-003	1.5900e-003	2.0000e-005	6.6000e-004	3.0000e-005	6.9000e-004	1.9000e-004	3.0000e-005	2.2000e-004	0.0000	1.9383	1.9383	6.0000e-005	2.8000e-004	2.0236
Worker	3.4800e-003	2.3500e-003	0.0314	1.1000e-004	0.0137	7.0000e-005	0.0138	3.6400e-003	6.0000e-005	3.7000e-003	0.0000	10.3538	10.3538	2.1000e-004	2.3000e-004	10.4290
Total	**4.1400e-003**	**0.0400**	**0.0423**	**2.7000e-004**	**0.0187**	**3.8000e-004**	**0.0190**	**5.0100e-003**	**3.6000e-004**	**5.3600e-003**	**0.0000**	**26.7328**	**26.7328**	**1.0700e-003**	**2.8100e-003**	**27.5988**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0290	0.2519	0.3572	6.4000e-004		0.0107	0.0107		0.0102	0.0102	0.0000	56.0198	56.0198	0.0109	0.0000	56.2921
Total	**0.0290**	**0.2519**	**0.3572**	**6.4000e-004**		**0.0107**	**0.0107**		**0.0102**	**0.0102**	**0.0000**	**56.0198**	**56.0198**	**0.0109**	**0.0000**	**56.2921**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Stage 3 Bridge Demolition - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.4000e-004	0.0332	9.2800e-003	1.4000e-004	4.2800e-003	2.8000e-004	4.5600e-003	1.1800e-003	2.7000e-004	1.4400e-003	0.0000	14.4408	14.4408	8.0000e-004	2.3000e-003	15.1463
Vendor	1.2000e-004	4.4600e-003	1.5900e-003	2.0000e-005	6.6000e-004	3.0000e-005	6.9000e-004	1.9000e-004	3.0000e-005	2.2000e-004	0.0000	1.9383	1.9383	6.0000e-005	2.8000e-004	2.0236
Worker	3.4800e-003	2.3500e-003	0.0314	1.1000e-004	0.0137	7.0000e-005	0.0138	3.6400e-003	6.0000e-005	3.7000e-003	0.0000	10.3538	10.3538	2.1000e-004	2.3000e-004	10.4290
Total	**4.1400e-003**	**0.0400**	**0.0423**	**2.7000e-004**	**0.0187**	**3.8000e-004**	**0.0190**	**5.0100e-003**	**3.6000e-004**	**5.3600e-003**	**0.0000**	**26.7328**	**26.7328**	**1.0700e-003**	**2.8100e-003**	**27.5988**

3.5 Stage 3 Coffer Dams For Piers - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0204	0.1780	0.2388	4.4000e-004		7.3700e-003	7.3700e-003		7.0700e-003	7.0700e-003	0.0000	38.3602	38.3602	6.7400e-003	0.0000	38.5288
Total	**0.0204**	**0.1780**	**0.2388**	**4.4000e-004**		**7.3700e-003**	**7.3700e-003**		**7.0700e-003**	**7.0700e-003**	**0.0000**	**38.3602**	**38.3602**	**6.7400e-003**	**0.0000**	**38.5288**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Stage 3 Coffer Dams For Piers - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0000e-005	2.2300e-003	8.0000e-004	1.0000e-005	3.3000e-004	1.0000e-005	3.4000e-004	1.0000e-004	1.0000e-005	1.1000e-004	0.0000	0.9691	0.9691	3.0000e-005	1.4000e-004	1.0118
Worker	1.7400e-003	1.1700e-003	0.0157	5.0000e-005	6.8600e-003	3.0000e-005	6.8900e-003	1.8200e-003	3.0000e-005	1.8500e-003	0.0000	5.1769	5.1769	1.0000e-004	1.2000e-004	5.2145
Total	**1.8000e-003**	**3.4000e-003**	**0.0165**	**6.0000e-005**	**7.1900e-003**	**4.0000e-005**	**7.2300e-003**	**1.9200e-003**	**4.0000e-005**	**1.9600e-003**	**0.0000**	**6.1460**	**6.1460**	**1.3000e-004**	**2.6000e-004**	**6.2263**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0204	0.1780	0.2388	4.4000e-004		7.3700e-003	7.3700e-003		7.0700e-003	7.0700e-003	0.0000	38.3602	38.3602	6.7400e-003	0.0000	38.5288
Total	**0.0204**	**0.1780**	**0.2388**	**4.4000e-004**		**7.3700e-003**	**7.3700e-003**		**7.0700e-003**	**7.0700e-003**	**0.0000**	**38.3602**	**38.3602**	**6.7400e-003**	**0.0000**	**38.5288**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Stage 3 Coffer Dams For Piers - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0000e-005	2.2300e-003	8.0000e-004	1.0000e-005	3.3000e-004	1.0000e-005	3.4000e-004	1.0000e-004	1.0000e-005	1.1000e-004	0.0000	0.9691	0.9691	3.0000e-005	1.4000e-004	1.0118
Worker	1.7400e-003	1.1700e-003	0.0157	5.0000e-005	6.8600e-003	3.0000e-005	6.8900e-003	1.8200e-003	3.0000e-005	1.8500e-003	0.0000	5.1769	5.1769	1.0000e-004	1.2000e-004	5.2145
Total	**1.8000e-003**	**3.4000e-003**	**0.0165**	**6.0000e-005**	**7.1900e-003**	**4.0000e-005**	**7.2300e-003**	**1.9200e-003**	**4.0000e-005**	**1.9600e-003**	**0.0000**	**6.1460**	**6.1460**	**1.3000e-004**	**2.6000e-004**	**6.2263**

3.6 Stage 3 Bridge Piers Forms and Steel - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0731	0.6270	0.8569	1.6900e-003		0.0247	0.0247		0.0235	0.0235	0.0000	145.5265	145.5265	0.0322	0.0000	146.3327
Total	**0.0731**	**0.6270**	**0.8569**	**1.6900e-003**		**0.0247**	**0.0247**		**0.0235**	**0.0235**	**0.0000**	**145.5265**	**145.5265**	**0.0322**	**0.0000**	**146.3327**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 3 Bridge Piers Forms and Steel - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-004	0.0102	3.6200e-003	4.0000e-005	1.5000e-003	6.0000e-005	1.5600e-003	4.3000e-004	6.0000e-005	4.9000e-004	0.0000	4.4051	4.4051	1.5000e-004	6.4000e-004	4.5990
Worker	7.9000e-003	5.3300e-003	0.0714	2.5000e-004	0.0312	1.5000e-004	0.0313	8.2800e-003	1.4000e-004	8.4200e-003	0.0000	23.5314	23.5314	4.7000e-004	5.3000e-004	23.7022
Total	**8.1600e-003**	**0.0155**	**0.0750**	**2.9000e-004**	**0.0327**	**2.1000e-004**	**0.0329**	**8.7100e-003**	**2.0000e-004**	**8.9100e-003**	**0.0000**	**27.9365**	**27.9365**	**6.2000e-004**	**1.1700e-003**	**28.3012**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0731	0.6270	0.8569	1.6900e-003		0.0247	0.0247		0.0235	0.0235	0.0000	145.5264	145.5264	0.0322	0.0000	146.3325
Total	**0.0731**	**0.6270**	**0.8569**	**1.6900e-003**		**0.0247**	**0.0247**		**0.0235**	**0.0235**	**0.0000**	**145.5264**	**145.5264**	**0.0322**	**0.0000**	**146.3325**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 3 Bridge Piers Forms and Steel - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-004	0.0102	3.6200e-003	4.0000e-005	1.5000e-003	6.0000e-005	1.5600e-003	4.3000e-004	6.0000e-005	4.9000e-004	0.0000	4.4051	4.4051	1.5000e-004	6.4000e-004	4.5990
Worker	7.9000e-003	5.3300e-003	0.0714	2.5000e-004	0.0312	1.5000e-004	0.0313	8.2800e-003	1.4000e-004	8.4200e-003	0.0000	23.5314	23.5314	4.7000e-004	5.3000e-004	23.7022
Total	**8.1600e-003**	**0.0155**	**0.0750**	**2.9000e-004**	**0.0327**	**2.1000e-004**	**0.0329**	**8.7100e-003**	**2.0000e-004**	**8.9100e-003**	**0.0000**	**27.9365**	**27.9365**	**6.2000e-004**	**1.1700e-003**	**28.3012**

3.7 Stage 3 Bridge Piers Concrete - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0300	0.2482	0.2839	6.6000e-004		0.0102	0.0102		9.7200e-003	9.7200e-003	0.0000	57.5117	57.5117	0.0118	0.0000	57.8056
Total	**0.0300**	**0.2482**	**0.2839**	**6.6000e-004**		**0.0102**	**0.0102**		**9.7200e-003**	**9.7200e-003**	**0.0000**	**57.5117**	**57.5117**	**0.0118**	**0.0000**	**57.8056**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Stage 3 Bridge Piers Concrete - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8000e-004	0.0173	4.8300e-003	7.0000e-005	2.2300e-003	1.4000e-004	2.3700e-003	6.1000e-004	1.4000e-004	7.5000e-004	0.0000	7.5092	7.5092	4.2000e-004	1.2000e-003	7.8761
Vendor	1.4000e-004	5.4800e-003	1.9500e-003	2.0000e-005	8.1000e-004	3.0000e-005	8.4000e-004	2.3000e-004	3.0000e-005	2.6000e-004	0.0000	2.3788	2.3788	8.0000e-005	3.4000e-004	2.4835
Worker	2.1300e-003	1.4400e-003	0.0193	7.0000e-005	8.4200e-003	4.0000e-005	8.4600e-003	2.2400e-003	4.0000e-005	2.2700e-003	0.0000	6.3535	6.3535	1.3000e-004	1.4000e-004	6.3996
Total	**2.5500e-003**	**0.0242**	**0.0261**	**1.6000e-004**	**0.0115**	**2.1000e-004**	**0.0117**	**3.0800e-003**	**2.1000e-004**	**3.2800e-003**	**0.0000**	**16.2415**	**16.2415**	**6.3000e-004**	**1.6800e-003**	**16.7591**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0300	0.2482	0.2839	6.6000e-004		0.0102	0.0102		9.7200e-003	9.7200e-003	0.0000	57.5116	57.5116	0.0118	0.0000	57.8055
Total	**0.0300**	**0.2482**	**0.2839**	**6.6000e-004**		**0.0102**	**0.0102**		**9.7200e-003**	**9.7200e-003**	**0.0000**	**57.5116**	**57.5116**	**0.0118**	**0.0000**	**57.8055**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Stage 3 Bridge Piers Concrete - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8000e-004	0.0173	4.8300e-003	7.0000e-005	2.2300e-003	1.4000e-004	2.3700e-003	6.1000e-004	1.4000e-004	7.5000e-004	0.0000	7.5092	7.5092	4.2000e-004	1.2000e-003	7.8761
Vendor	1.4000e-004	5.4800e-003	1.9500e-003	2.0000e-005	8.1000e-004	3.0000e-005	8.4000e-004	2.3000e-004	3.0000e-005	2.6000e-004	0.0000	2.3788	2.3788	8.0000e-005	3.4000e-004	2.4835
Worker	2.1300e-003	1.4400e-003	0.0193	7.0000e-005	8.4200e-003	4.0000e-005	8.4600e-003	2.2400e-003	4.0000e-005	2.2700e-003	0.0000	6.3535	6.3535	1.3000e-004	1.4000e-004	6.3996
Total	**2.5500e-003**	**0.0242**	**0.0261**	**1.6000e-004**	**0.0115**	**2.1000e-004**	**0.0117**	**3.0800e-003**	**2.1000e-004**	**3.2800e-003**	**0.0000**	**16.2415**	**16.2415**	**6.3000e-004**	**1.6800e-003**	**16.7591**

3.8 Stage 3 Bridge Deck Forms and Steel - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0342	0.2923	0.3515	6.6000e-004		0.0115	0.0115		0.0111	0.0111	0.0000	56.6761	56.6761	9.4400e-003	0.0000	56.9120
Total	**0.0342**	**0.2923**	**0.3515**	**6.6000e-004**		**0.0115**	**0.0115**		**0.0111**	**0.0111**	**0.0000**	**56.6761**	**56.6761**	**9.4400e-003**	**0.0000**	**56.9120**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.8 Stage 3 Bridge Deck Forms and Steel - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.4000e-004	0.0335	9.6300e-003	1.4000e-004	4.3900e-003	2.8000e-004	4.6700e-003	1.2000e-003	2.7000e-004	1.4700e-003	0.0000	14.4787	14.4787	8.5000e-004	2.3100e-003	15.1877
Vendor	1.5000e-004	6.0200e-003	2.1400e-003	3.0000e-005	9.0000e-004	4.0000e-005	9.4000e-004	2.6000e-004	3.0000e-005	2.9000e-004	0.0000	2.5926	2.5926	9.0000e-005	3.8000e-004	2.7067
Worker	4.4900e-003	2.9100e-003	0.0404	1.4000e-004	0.0187	9.0000e-005	0.0188	4.9700e-003	8.0000e-005	5.0500e-003	0.0000	13.7897	13.7897	2.6000e-004	3.0000e-004	13.8862
Total	**5.1800e-003**	**0.0424**	**0.0522**	**3.1000e-004**	**0.0240**	**4.1000e-004**	**0.0244**	**6.4300e-003**	**3.8000e-004**	**6.8100e-003**	**0.0000**	**30.8611**	**30.8611**	**1.2000e-003**	**2.9900e-003**	**31.7806**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0342	0.2923	0.3515	6.6000e-004		0.0115	0.0115		0.0111	0.0111	0.0000	56.6760	56.6760	9.4400e-003	0.0000	56.9119
Total	**0.0342**	**0.2923**	**0.3515**	**6.6000e-004**		**0.0115**	**0.0115**		**0.0111**	**0.0111**	**0.0000**	**56.6760**	**56.6760**	**9.4400e-003**	**0.0000**	**56.9119**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.8 Stage 3 Bridge Deck Forms and Steel - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.4000e-004	0.0335	9.6300e-003	1.4000e-004	4.3900e-003	2.8000e-004	4.6700e-003	1.2000e-003	2.7000e-004	1.4700e-003	0.0000	14.4787	14.4787	8.5000e-004	2.3100e-003	15.1877
Vendor	1.5000e-004	6.0200e-003	2.1400e-003	3.0000e-005	9.0000e-004	4.0000e-005	9.4000e-004	2.6000e-004	3.0000e-005	2.9000e-004	0.0000	2.5926	2.5926	9.0000e-005	3.8000e-004	2.7067
Worker	4.4900e-003	2.9100e-003	0.0404	1.4000e-004	0.0187	9.0000e-005	0.0188	4.9700e-003	8.0000e-005	5.0500e-003	0.0000	13.7897	13.7897	2.6000e-004	3.0000e-004	13.8862
Total	**5.1800e-003**	**0.0424**	**0.0522**	**3.1000e-004**	**0.0240**	**4.1000e-004**	**0.0244**	**6.4300e-003**	**3.8000e-004**	**6.8100e-003**	**0.0000**	**30.8611**	**30.8611**	**1.2000e-003**	**2.9900e-003**	**31.7806**

3.9 Stage 3 Night Delivery - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.1500e-003	0.0212	0.0271	5.0000e-005		8.3000e-004	8.3000e-004		8.0000e-004	8.0000e-004	0.0000	4.4283	4.4283	7.8000e-004	0.0000	4.4479
Total	**2.1500e-003**	**0.0212**	**0.0271**	**5.0000e-005**		**8.3000e-004**	**8.3000e-004**		**8.0000e-004**	**8.0000e-004**	**0.0000**	**4.4283**	**4.4283**	**7.8000e-004**	**0.0000**	**4.4479**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.9 Stage 3 Night Delivery - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	8.0000e-004	2.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.3457	0.3457	1.0000e-005	5.0000e-005	0.3609
Worker	3.0000e-004	1.9000e-004	2.6900e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	0.9193	0.9193	2.0000e-005	2.0000e-005	0.9258
Total	**3.2000e-004**	**9.9000e-004**	**2.9800e-003**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3700e-003**	**3.6000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.2650**	**1.2650**	**3.0000e-005**	**7.0000e-005**	**1.2867**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.1500e-003	0.0212	0.0271	5.0000e-005		8.3000e-004	8.3000e-004		8.0000e-004	8.0000e-004	0.0000	4.4283	4.4283	7.8000e-004	0.0000	4.4479
Total	**2.1500e-003**	**0.0212**	**0.0271**	**5.0000e-005**		**8.3000e-004**	**8.3000e-004**		**8.0000e-004**	**8.0000e-004**	**0.0000**	**4.4283**	**4.4283**	**7.8000e-004**	**0.0000**	**4.4479**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.9 Stage 3 Night Delivery - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	8.0000e-004	2.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.3457	0.3457	1.0000e-005	5.0000e-005	0.3609
Worker	3.0000e-004	1.9000e-004	2.6900e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	0.9193	0.9193	2.0000e-005	2.0000e-005	0.9258
Total	**3.2000e-004**	**9.9000e-004**	**2.9800e-003**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3700e-003**	**3.6000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.2650**	**1.2650**	**3.0000e-005**	**7.0000e-005**	**1.2867**

3.10 Stage 3 Bridge Deck Concrete - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0272	0.1978	0.2808	5.7000e-004		8.4700e-003	8.4700e-003		8.1700e-003	8.1700e-003	0.0000	49.6470	49.6470	8.7100e-003	0.0000	49.8647
Total	**0.0272**	**0.1978**	**0.2808**	**5.7000e-004**		**8.4700e-003**	**8.4700e-003**		**8.1700e-003**	**8.1700e-003**	**0.0000**	**49.6470**	**49.6470**	**8.7100e-003**	**0.0000**	**49.8647**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.10 Stage 3 Bridge Deck Concrete - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8000e-004	0.0170	4.8900e-003	7.0000e-005	2.2300e-003	1.4000e-004	2.3700e-003	6.1000e-004	1.4000e-004	7.5000e-004	0.0000	7.3525	7.3525	4.3000e-004	1.1700e-003	7.7125
Vendor	1.5000e-004	5.8200e-003	2.0700e-003	3.0000e-005	8.7000e-004	3.0000e-005	9.1000e-004	2.5000e-004	3.0000e-005	2.8000e-004	0.0000	2.5062	2.5062	9.0000e-005	3.6000e-004	2.6165
Worker	2.1700e-003	1.4100e-003	0.0195	7.0000e-005	9.0400e-003	4.0000e-005	9.0800e-003	2.4000e-003	4.0000e-005	2.4400e-003	0.0000	6.6650	6.6650	1.2000e-004	1.5000e-004	6.7117
Total	**2.6000e-003**	**0.0242**	**0.0265**	**1.7000e-004**	**0.0121**	**2.1000e-004**	**0.0124**	**3.2600e-003**	**2.1000e-004**	**3.4700e-003**	**0.0000**	**16.5237**	**16.5237**	**6.4000e-004**	**1.6800e-003**	**17.0407**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0272	0.1978	0.2808	5.7000e-004		8.4700e-003	8.4700e-003		8.1700e-003	8.1700e-003	0.0000	49.6470	49.6470	8.7100e-003	0.0000	49.8647
Total	**0.0272**	**0.1978**	**0.2808**	**5.7000e-004**		**8.4700e-003**	**8.4700e-003**		**8.1700e-003**	**8.1700e-003**	**0.0000**	**49.6470**	**49.6470**	**8.7100e-003**	**0.0000**	**49.8647**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.10 Stage 3 Bridge Deck Concrete - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8000e-004	0.0170	4.8900e-003	7.0000e-005	2.2300e-003	1.4000e-004	2.3700e-003	6.1000e-004	1.4000e-004	7.5000e-004	0.0000	7.3525	7.3525	4.3000e-004	1.1700e-003	7.7125
Vendor	1.5000e-004	5.8200e-003	2.0700e-003	3.0000e-005	8.7000e-004	3.0000e-005	9.1000e-004	2.5000e-004	3.0000e-005	2.8000e-004	0.0000	2.5062	2.5062	9.0000e-005	3.6000e-004	2.6165
Worker	2.1700e-003	1.4100e-003	0.0195	7.0000e-005	9.0400e-003	4.0000e-005	9.0800e-003	2.4000e-003	4.0000e-005	2.4400e-003	0.0000	6.6650	6.6650	1.2000e-004	1.5000e-004	6.7117
Total	**2.6000e-003**	**0.0242**	**0.0265**	**1.7000e-004**	**0.0121**	**2.1000e-004**	**0.0124**	**3.2600e-003**	**2.1000e-004**	**3.4700e-003**	**0.0000**	**16.5237**	**16.5237**	**6.4000e-004**	**1.6800e-003**	**17.0407**

3.11 Stage 3 Paving - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1800e-003	0.0113	0.0190	3.0000e-005		5.3000e-004	5.3000e-004		4.8000e-004	4.8000e-004	0.0000	2.5500	2.5500	8.2000e-004	0.0000	2.5706
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1800e-003**	**0.0113**	**0.0190**	**3.0000e-005**		**5.3000e-004**	**5.3000e-004**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**2.5500**	**2.5500**	**8.2000e-004**	**0.0000**	**2.5706**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.11 Stage 3 Paving - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	1.3100e-003	3.8000e-004	1.0000e-005	1.7000e-004	1.0000e-005	1.8000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.5656	0.5656	3.0000e-005	9.0000e-005	0.5933
Vendor	2.0000e-005	8.0000e-004	2.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.3457	0.3457	1.0000e-005	5.0000e-005	0.3609
Worker	2.4000e-004	1.6000e-004	2.1500e-003	1.0000e-005	1.0000e-003	0.0000	1.0000e-003	2.7000e-004	0.0000	2.7000e-004	0.0000	0.7355	0.7355	1.0000e-005	2.0000e-005	0.7406
Total	**2.8000e-004**	**2.2700e-003**	**2.8200e-003**	**2.0000e-005**	**1.2900e-003**	**1.0000e-005**	**1.3000e-003**	**3.5000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.6467**	**1.6467**	**5.0000e-005**	**1.6000e-004**	**1.6948**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1800e-003	0.0113	0.0190	3.0000e-005		5.3000e-004	5.3000e-004		4.8000e-004	4.8000e-004	0.0000	2.5500	2.5500	8.2000e-004	0.0000	2.5706
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1800e-003**	**0.0113**	**0.0190**	**3.0000e-005**		**5.3000e-004**	**5.3000e-004**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**2.5500**	**2.5500**	**8.2000e-004**	**0.0000**	**2.5706**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.11 Stage 3 Paving - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	1.3100e-003	3.8000e-004	1.0000e-005	1.7000e-004	1.0000e-005	1.8000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.5656	0.5656	3.0000e-005	9.0000e-005	0.5933
Vendor	2.0000e-005	8.0000e-004	2.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.3457	0.3457	1.0000e-005	5.0000e-005	0.3609
Worker	2.4000e-004	1.6000e-004	2.1500e-003	1.0000e-005	1.0000e-003	0.0000	1.0000e-003	2.7000e-004	0.0000	2.7000e-004	0.0000	0.7355	0.7355	1.0000e-005	2.0000e-005	0.7406
Total	**2.8000e-004**	**2.2700e-003**	**2.8200e-003**	**2.0000e-005**	**1.2900e-003**	**1.0000e-005**	**1.3000e-003**	**3.5000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.6467**	**1.6467**	**5.0000e-005**	**1.6000e-004**	**1.6948**

3.12 Stage 3 Pavement Marking - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0104					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5000e-004	2.2000e-003	2.8000e-003	1.0000e-005		9.0000e-005	9.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.7507	0.7507	2.0000e-004	0.0000	0.7556
Total	**0.0108**	**2.2000e-003**	**2.8000e-003**	**1.0000e-005**		**9.0000e-005**	**9.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.7507**	**0.7507**	**2.0000e-004**	**0.0000**	**0.7556**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.12 Stage 3 Pavement Marking - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.7000e-004	0.0000	1.2000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0919	0.0919	0.0000	0.0000	0.0926
Total	**3.0000e-005**	**2.0000e-005**	**2.7000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0919**	**0.0919**	**0.0000**	**0.0000**	**0.0926**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0104					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5000e-004	2.2000e-003	2.8000e-003	1.0000e-005		9.0000e-005	9.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.7507	0.7507	2.0000e-004	0.0000	0.7556
Total	**0.0108**	**2.2000e-003**	**2.8000e-003**	**1.0000e-005**		**9.0000e-005**	**9.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.7507**	**0.7507**	**2.0000e-004**	**0.0000**	**0.7556**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.12 Stage 3 Pavement Marking - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.7000e-004	0.0000	1.2000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0919	0.0919	0.0000	0.0000	0.0926
Total	**3.0000e-005**	**2.0000e-005**	**2.7000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0919**	**0.0919**	**0.0000**	**0.0000**	**0.0926**

Camino Del Mar Bridge Replacement Stage 3 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.568480	0.062094	0.174123	0.115064	0.023357	0.006399	0.009361	0.006325	0.000693	0.000596	0.028205	0.000919	0.004383

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Unmitigated	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Camino Del Mar Bridge Replacement Stage 4

San Diego County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	50.00	1000sqft	1.15	50,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2027
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - This model is for construction impacts only.

Land Use - Land use area is approximate footprint of construction area and is not used in model calculations.

Construction Phase - Construction schedule per project engineers.

Off-road Equipment - Equipment estimate per project eningeers.
Off-Highway Trucks = concrete pump truck.

Off-road Equipment - Equipment estimate per project eningeers.

Trips and VMT - Trips based on equipment estimates, stage activity and material requirements.

Construction Off-road Equipment Mitigation - Fugitive dust mitigation to meet SDAPCD Rule 55 requirements.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	20.00
tblConstructionPhase	NumDays	200.00	21.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	100.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00

2.0 Emissions Summary

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2026	2.3149	16.9194	24.5236	0.0499	1.3386	0.6428	1.9814	0.3564	0.6243	0.9807	0.0000	4,801.2881	4,801.2881	0.6321	0.0862	4,829.6807
Maximum	**2.3149**	**16.9194**	**24.5236**	**0.0499**	**1.3386**	**0.6428**	**1.9814**	**0.3564**	**0.6243**	**0.9807**	**0.0000**	**4,801.2881**	**4,801.2881**	**0.6321**	**0.0862**	**4,829.6807**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2026	2.3149	16.9194	24.5236	0.0499	1.3386	0.6428	1.9814	0.3564	0.6243	0.9807	0.0000	4,801.2881	4,801.2881	0.6321	0.0862	4,829.6807
Maximum	**2.3149**	**16.9194**	**24.5236**	**0.0499**	**1.3386**	**0.6428**	**1.9814**	**0.3564**	**0.6243**	**0.9807**	**0.0000**	**4,801.2881**	**4,801.2881**	**0.6321**	**0.0862**	**4,829.6807**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**	**0.0000**	**0.0117**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**	**0.0000**	**0.0117**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Stage 4 Bridge Gap Forms and Steel	Building Construction	4/1/2026	4/28/2026	5	20	
2	Stage 4 Bridge Gap Concrete	Building Construction	4/29/2026	5/27/2026	5	21	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 1.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Stage 4 Bridge Gap Forms and Steel	Air Compressors	2	8.00	78	0.48
Stage 4 Bridge Gap Forms and Steel	Cranes	1	8.00	231	0.29
Stage 4 Bridge Gap Forms and Steel	Generator Sets	2	8.00	84	0.74
Stage 4 Bridge Gap Forms and Steel	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 4 Bridge Gap Forms and Steel	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 4 Bridge Gap Forms and Steel	Welders	2	8.00	46	0.45
Stage 4 Bridge Gap Concrete	Air Compressors	2	8.00	78	0.48
Stage 4 Bridge Gap Concrete	Generator Sets	2	8.00	84	0.74
Stage 4 Bridge Gap Concrete	Off-Highway Trucks	1	8.00	402	0.38

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Stage 4 Bridge Gap Concrete	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Stage 4 Bridge Gap Forms and Steel	9	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 4 Bridge Gap Concrete	6	50.00	10.00	100.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Stage 4 Bridge Gap Forms and Steel - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9699	16.3171	21.6983	0.0385		0.6347	0.6347		0.6167	0.6167		3,606.1523	3,606.1523	0.5128		3,618.9717
Total	**1.9699**	**16.3171**	**21.6983**	**0.0385**		**0.6347**	**0.6347**		**0.6167**	**0.6167**		**3,606.1523**	**3,606.1523**	**0.5128**		**3,618.9717**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 4 Bridge Gap Forms and Steel - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.3351	0.1978	2.6798	9.5600e-003	1.2773	5.7500e-003	1.2831	0.3387	5.2900e-003	0.3440		1,004.4276	1,004.4276	0.0193	0.0225	1,011.6040
Total	**0.3450**	**0.6023**	**2.8253**	**0.0113**	**1.3386**	**8.1100e-003**	**1.3467**	**0.3564**	**7.5500e-003**	**0.3639**		**1,195.1358**	**1,195.1358**	**0.0258**	**0.0501**	**1,210.7090**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9699	16.3171	21.6983	0.0385		0.6347	0.6347		0.6167	0.6167	0.0000	3,606.1523	3,606.1523	0.5128		3,618.9716
Total	**1.9699**	**16.3171**	**21.6983**	**0.0385**		**0.6347**	**0.6347**		**0.6167**	**0.6167**	**0.0000**	**3,606.1523**	**3,606.1523**	**0.5128**		**3,618.9716**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 4 Bridge Gap Forms and Steel - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.3351	0.1978	2.6798	9.5600e-003	1.2773	5.7500e-003	1.2831	0.3387	5.2900e-003	0.3440		1,004.4276	1,004.4276	0.0193	0.0225	1,011.6040
Total	**0.3450**	**0.6023**	**2.8253**	**0.0113**	**1.3386**	**8.1100e-003**	**1.3467**	**0.3564**	**7.5500e-003**	**0.3639**		**1,195.1358**	**1,195.1358**	**0.0258**	**0.0501**	**1,210.7090**

3.3 Stage 4 Bridge Gap Concrete - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5981	12.0468	17.5585	0.0374		0.4846	0.4846		0.4721	0.4721		3,578.3286	3,578.3286	0.5986		3,593.2923
Total	**1.5981**	**12.0468**	**17.5585**	**0.0374**		**0.4846**	**0.4846**		**0.4721**	**0.4721**		**3,578.3286**	**3,578.3286**	**0.5986**		**3,593.2923**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 4 Bridge Gap Concrete - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.7600e-003	0.6241	0.1804	2.6700e-003	0.0833	5.2600e-003	0.0886	0.0228	5.0300e-003	0.0279		297.0521	297.0521	0.0173	0.0474	311.5956
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.1675	0.0989	1.3399	4.7800e-003	0.6387	2.8700e-003	0.6415	0.1694	2.6400e-003	0.1720		502.2138	502.2138	9.6300e-003	0.0112	505.8020
Total	**0.1873**	**1.1276**	**1.6658**	**9.2100e-003**	**0.7832**	**0.0105**	**0.7937**	**0.2098**	**9.9300e-003**	**0.2198**		**989.9741**	**989.9741**	**0.0335**	**0.0862**	**1,016.5027**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5981	12.0468	17.5585	0.0374		0.4846	0.4846		0.4721	0.4721	0.0000	3,578.3286	3,578.3286	0.5986		3,593.2923
Total	**1.5981**	**12.0468**	**17.5585**	**0.0374**		**0.4846**	**0.4846**		**0.4721**	**0.4721**	**0.0000**	**3,578.3286**	**3,578.3286**	**0.5986**		**3,593.2923**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 4 Bridge Gap Concrete - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.7600e-003	0.6241	0.1804	2.6700e-003	0.0833	5.2600e-003	0.0886	0.0228	5.0300e-003	0.0279		297.0521	297.0521	0.0173	0.0474	311.5956
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.1675	0.0989	1.3399	4.7800e-003	0.6387	2.8700e-003	0.6415	0.1694	2.6400e-003	0.1720		502.2138	502.2138	9.6300e-003	0.0112	505.8020
Total	**0.1873**	**1.1276**	**1.6658**	**9.2100e-003**	**0.7832**	**0.0105**	**0.7937**	**0.2098**	**9.9300e-003**	**0.2198**		**989.9741**	**989.9741**	**0.0335**	**0.0862**	**1,016.5027**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.568480	0.062094	0.174123	0.115064	0.023357	0.006399	0.009361	0.006325	0.000693	0.000596	0.028205	0.000919	0.004383

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Unmitigated	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	9.5200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0177					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7000e-004	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**		**0.0117**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	9.5200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0177					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7000e-004	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**		**0.0117**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Camino Del Mar Bridge Replacement Stage 4

San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	50.00	1000sqft	1.15	50,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2027
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - This model is for construction impacts only.

Land Use - Land use area is approximate footprint of construction area and is not used in model calculations.

Construction Phase - Construction schedule per project engineers.

Off-road Equipment - Equipment estimate per project eningeers.
Off-Highway Trucks = concrete pump truck.

Off-road Equipment - Equipment estimate per project eningeers.

Trips and VMT - Trips based on equipment estimates, stage activity and material requirements.

Construction Off-road Equipment Mitigation - Fugitive dust mitigation to meet SDAPCD Rule 55 requirements.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	20.00
tblConstructionPhase	NumDays	200.00	21.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	100.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00

2.0 Emissions Summary

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2026	0.0414	0.3074	0.4472	9.9000e-004	0.0211	0.0116	0.0327	5.6400e-003	0.0113	0.0170	0.0000	87.1903	87.1903	0.0109	1.2700e-003	87.8416
Maximum	**0.0414**	**0.3074**	**0.4472**	**9.9000e-004**	**0.0211**	**0.0116**	**0.0327**	**5.6400e-003**	**0.0113**	**0.0170**	**0.0000**	**87.1903**	**87.1903**	**0.0109**	**1.2700e-003**	**87.8416**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2026	0.0414	0.3074	0.4472	9.9000e-004	0.0211	0.0116	0.0327	5.6400e-003	0.0113	0.0170	0.0000	87.1902	87.1902	0.0109	1.2700e-003	87.8416
Maximum	**0.0414**	**0.3074**	**0.4472**	**9.9000e-004**	**0.0211**	**0.0116**	**0.0327**	**5.6400e-003**	**0.0113**	**0.0170**	**0.0000**	**87.1902**	**87.1902**	**0.0109**	**1.2700e-003**	**87.8416**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-1-2026	6-30-2026	0.3458	0.3458
		Highest	0.3458	0.3458

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Stage 4 Bridge Gap Forms and Steel	Building Construction	4/1/2026	4/28/2026	5	20	
2	Stage 4 Bridge Gap Concrete	Building Construction	4/29/2026	5/27/2026	5	21	

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 1.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Stage 4 Bridge Gap Forms and Steel	Air Compressors	2	8.00	78	0.48
Stage 4 Bridge Gap Forms and Steel	Cranes	1	8.00	231	0.29
Stage 4 Bridge Gap Forms and Steel	Generator Sets	2	8.00	84	0.74
Stage 4 Bridge Gap Forms and Steel	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 4 Bridge Gap Forms and Steel	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 4 Bridge Gap Forms and Steel	Welders	2	8.00	46	0.45
Stage 4 Bridge Gap Concrete	Air Compressors	2	8.00	78	0.48
Stage 4 Bridge Gap Concrete	Generator Sets	2	8.00	84	0.74
Stage 4 Bridge Gap Concrete	Off-Highway Trucks	1	8.00	402	0.38
Stage 4 Bridge Gap Concrete	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Stage 4 Bridge Gap Forms and Steel	9	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 4 Bridge Gap Concrete	6	50.00	10.00	100.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 4 Bridge Gap Forms and Steel - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0197	0.1632	0.2170	3.9000e-004		6.3500e-003	6.3500e-003		6.1700e-003	6.1700e-003	0.0000	32.7145	32.7145	4.6500e-003	0.0000	32.8308
Total	**0.0197**	**0.1632**	**0.2170**	**3.9000e-004**		**6.3500e-003**	**6.3500e-003**		**6.1700e-003**	**6.1700e-003**	**0.0000**	**32.7145**	**32.7145**	**4.6500e-003**	**0.0000**	**32.8308**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-004	4.0200e-003	1.4300e-003	2.0000e-005	6.0000e-004	2.0000e-005	6.2000e-004	1.7000e-004	2.0000e-005	2.0000e-004	0.0000	1.7284	1.7284	6.0000e-005	2.5000e-004	1.8045
Worker	3.0000e-003	1.9400e-003	0.0269	1.0000e-004	0.0125	6.0000e-005	0.0125	3.3100e-003	5.0000e-005	3.3700e-003	0.0000	9.1932	9.1932	1.7000e-004	2.0000e-004	9.2575
Total	**3.1000e-003**	**5.9600e-003**	**0.0284**	**1.2000e-004**	**0.0131**	**8.0000e-005**	**0.0132**	**3.4800e-003**	**7.0000e-005**	**3.5700e-003**	**0.0000**	**10.9216**	**10.9216**	**2.3000e-004**	**4.5000e-004**	**11.0620**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 4 Bridge Gap Forms and Steel - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0197	0.1632	0.2170	3.9000e-004		6.3500e-003	6.3500e-003		6.1700e-003	6.1700e-003	0.0000	32.7144	32.7144	4.6500e-003	0.0000	32.8307
Total	**0.0197**	**0.1632**	**0.2170**	**3.9000e-004**		**6.3500e-003**	**6.3500e-003**		**6.1700e-003**	**6.1700e-003**	**0.0000**	**32.7144**	**32.7144**	**4.6500e-003**	**0.0000**	**32.8307**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-004	4.0200e-003	1.4300e-003	2.0000e-005	6.0000e-004	2.0000e-005	6.2000e-004	1.7000e-004	2.0000e-005	2.0000e-004	0.0000	1.7284	1.7284	6.0000e-005	2.5000e-004	1.8045
Worker	3.0000e-003	1.9400e-003	0.0269	1.0000e-004	0.0125	6.0000e-005	0.0125	3.3100e-003	5.0000e-005	3.3700e-003	0.0000	9.1932	9.1932	1.7000e-004	2.0000e-004	9.2575
Total	**3.1000e-003**	**5.9600e-003**	**0.0284**	**1.2000e-004**	**0.0131**	**8.0000e-005**	**0.0132**	**3.4800e-003**	**7.0000e-005**	**3.5700e-003**	**0.0000**	**10.9216**	**10.9216**	**2.3000e-004**	**4.5000e-004**	**11.0620**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 4 Bridge Gap Concrete - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0168	0.1265	0.1844	3.9000e-004		5.0900e-003	5.0900e-003		4.9600e-003	4.9600e-003	0.0000	34.0852	34.0852	5.7000e-003	0.0000	34.2277
Total	**0.0168**	**0.1265**	**0.1844**	**3.9000e-004**		**5.0900e-003**	**5.0900e-003**		**4.9600e-003**	**4.9600e-003**	**0.0000**	**34.0852**	**34.0852**	**5.7000e-003**	**0.0000**	**34.2277**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1000e-004	6.5300e-003	1.8800e-003	3.0000e-005	8.6000e-004	6.0000e-005	9.1000e-004	2.4000e-004	5.0000e-005	2.9000e-004	0.0000	2.8279	2.8279	1.7000e-004	4.5000e-004	2.9663
Vendor	1.1000e-004	4.2200e-003	1.5000e-003	2.0000e-005	6.3000e-004	2.0000e-005	6.6000e-004	1.8000e-004	2.0000e-005	2.1000e-004	0.0000	1.8148	1.8148	6.0000e-005	2.6000e-004	1.8947
Worker	1.5700e-003	1.0200e-003	0.0141	5.0000e-005	6.5500e-003	3.0000e-005	6.5800e-003	1.7400e-003	3.0000e-005	1.7700e-003	0.0000	4.8264	4.8264	9.0000e-005	1.1000e-004	4.8602
Total	**1.7900e-003**	**0.0118**	**0.0175**	**1.0000e-004**	**8.0400e-003**	**1.1000e-004**	**8.1500e-003**	**2.1600e-003**	**1.0000e-004**	**2.2700e-003**	**0.0000**	**9.4691**	**9.4691**	**3.2000e-004**	**8.2000e-004**	**9.7212**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 4 Bridge Gap Concrete - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0168	0.1265	0.1844	3.9000e-004		5.0900e-003	5.0900e-003		4.9600e-003	4.9600e-003	0.0000	34.0851	34.0851	5.7000e-003	0.0000	34.2277
Total	**0.0168**	**0.1265**	**0.1844**	**3.9000e-004**		**5.0900e-003**	**5.0900e-003**		**4.9600e-003**	**4.9600e-003**	**0.0000**	**34.0851**	**34.0851**	**5.7000e-003**	**0.0000**	**34.2277**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1000e-004	6.5300e-003	1.8800e-003	3.0000e-005	8.6000e-004	6.0000e-005	9.1000e-004	2.4000e-004	5.0000e-005	2.9000e-004	0.0000	2.8279	2.8279	1.7000e-004	4.5000e-004	2.9663
Vendor	1.1000e-004	4.2200e-003	1.5000e-003	2.0000e-005	6.3000e-004	2.0000e-005	6.6000e-004	1.8000e-004	2.0000e-005	2.1000e-004	0.0000	1.8148	1.8148	6.0000e-005	2.6000e-004	1.8947
Worker	1.5700e-003	1.0200e-003	0.0141	5.0000e-005	6.5500e-003	3.0000e-005	6.5800e-003	1.7400e-003	3.0000e-005	1.7700e-003	0.0000	4.8264	4.8264	9.0000e-005	1.1000e-004	4.8602
Total	**1.7900e-003**	**0.0118**	**0.0175**	**1.0000e-004**	**8.0400e-003**	**1.1000e-004**	**8.1500e-003**	**2.1600e-003**	**1.0000e-004**	**2.2700e-003**	**0.0000**	**9.4691**	**9.4691**	**3.2000e-004**	**8.2000e-004**	**9.7212**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.568480	0.062094	0.174123	0.115064	0.023357	0.006399	0.009361	0.006325	0.000693	0.000596	0.028205	0.000919	0.004383

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Unmitigated	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Camino Del Mar Bridge Replacement Stage 4

San Diego County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	50.00	1000sqft	1.15	50,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2027
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - This model is for construction impacts only.

Land Use - Land use area is approximate footprint of construction area and is not used in model calculations.

Construction Phase - Construction schedule per project engineers.

Off-road Equipment - Equipment estimate per project eningeers.
Off-Highway Trucks = concrete pump truck.

Off-road Equipment - Equipment estimate per project eningeers.

Trips and VMT - Trips based on equipment estimates, stage activity and material requirements.

Construction Off-road Equipment Mitigation - Fugitive dust mitigation to meet SDAPCD Rule 55 requirements.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	20.00
tblConstructionPhase	NumDays	200.00	21.00
tblConstructionPhase	PhaseEndDate	1/5/2027	4/28/2026

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstructionPhase	PhaseEndDate	10/12/2027	2/3/2027
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	100.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	21.00	100.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00

2.0 Emissions Summary

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2026	2.3149	16.9194	24.5236	0.0499	1.3386	0.6428	1.9814	0.3564	0.6243	0.9807	0.0000	4,801.2881	4,801.2881	0.5386	0.0501	4,829.6807
2027	1.7767	13.1523	19.1549	0.0464	0.7832	0.4949	1.2781	0.2098	0.4818	0.6917	0.0000	4,546.7621	4,546.7621	0.6318	0.0840	4,587.5962
Maximum	**2.3149**	**16.9194**	**24.5236**	**0.0499**	**1.3386**	**0.6428**	**1.9814**	**0.3564**	**0.6243**	**0.9807**	**0.0000**	**4,801.2881**	**4,801.2881**	**0.6318**	**0.0840**	**4,829.6807**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2026	2.3149	16.9194	24.5236	0.0499	1.3386	0.6428	1.9814	0.3564	0.6243	0.9807	0.0000	4,801.2881	4,801.2881	0.5386	0.0501	4,829.6807
2027	1.7767	13.1523	19.1549	0.0464	0.7832	0.4949	1.2781	0.2098	0.4818	0.6917	0.0000	4,546.7621	4,546.7621	0.6318	0.0840	4,587.5961
Maximum	**2.3149**	**16.9194**	**24.5236**	**0.0499**	**1.3386**	**0.6428**	**1.9814**	**0.3564**	**0.6243**	**0.9807**	**0.0000**	**4,801.2881**	**4,801.2881**	**0.6318**	**0.0840**	**4,829.6807**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**	**0.0000**	**0.0117**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**	**0.0000**	**0.0117**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Stage 4 Bridge Gap Forms and Steel	Building Construction	4/1/2026	4/28/2026	5	20	
2	Stage 4 Bridge Gap Concrete	Building Construction	1/6/2027	2/3/2027	5	21	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 1.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Stage 4 Bridge Gap Forms and Steel	Air Compressors	2	8.00	78	0.48
Stage 4 Bridge Gap Forms and Steel	Cranes	1	8.00	231	0.29
Stage 4 Bridge Gap Forms and Steel	Generator Sets	2	8.00	84	0.74
Stage 4 Bridge Gap Forms and Steel	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 4 Bridge Gap Forms and Steel	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 4 Bridge Gap Forms and Steel	Welders	2	8.00	46	0.45
Stage 4 Bridge Gap Concrete	Air Compressors	2	8.00	78	0.48
Stage 4 Bridge Gap Concrete	Generator Sets	2	8.00	84	0.74
Stage 4 Bridge Gap Concrete	Off-Highway Trucks	1	8.00	402	0.38

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Stage 4 Bridge Gap Concrete	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Stage 4 Bridge Gap Forms and Steel	9	100.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 4 Bridge Gap Concrete	6	50.00	10.00	100.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Stage 4 Bridge Gap Forms and Steel - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9699	16.3171	21.6983	0.0385		0.6347	0.6347		0.6167	0.6167		3,606.1523	3,606.1523	0.5128		3,618.9717
Total	**1.9699**	**16.3171**	**21.6983**	**0.0385**		**0.6347**	**0.6347**		**0.6167**	**0.6167**		**3,606.1523**	**3,606.1523**	**0.5128**		**3,618.9717**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 4 Bridge Gap Forms and Steel - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.3351	0.1978	2.6798	9.5600e-003	1.2773	5.7500e-003	1.2831	0.3387	5.2900e-003	0.3440		1,004.4276	1,004.4276	0.0193	0.0225	1,011.6040
Total	**0.3450**	**0.6023**	**2.8253**	**0.0113**	**1.3386**	**8.1100e-003**	**1.3467**	**0.3564**	**7.5500e-003**	**0.3639**		**1,195.1358**	**1,195.1358**	**0.0258**	**0.0501**	**1,210.7090**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9699	16.3171	21.6983	0.0385		0.6347	0.6347		0.6167	0.6167	0.0000	3,606.1523	3,606.1523	0.5128		3,618.9716
Total	**1.9699**	**16.3171**	**21.6983**	**0.0385**		**0.6347**	**0.6347**		**0.6167**	**0.6167**	**0.0000**	**3,606.1523**	**3,606.1523**	**0.5128**		**3,618.9716**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 4 Bridge Gap Forms and Steel - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.3351	0.1978	2.6798	9.5600e-003	1.2773	5.7500e-003	1.2831	0.3387	5.2900e-003	0.3440		1,004.4276	1,004.4276	0.0193	0.0225	1,011.6040
Total	**0.3450**	**0.6023**	**2.8253**	**0.0113**	**1.3386**	**8.1100e-003**	**1.3467**	**0.3564**	**7.5500e-003**	**0.3639**		**1,195.1358**	**1,195.1358**	**0.0258**	**0.0501**	**1,210.7090**

3.3 Stage 4 Bridge Gap Concrete - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5981	12.0468	17.5585	0.0374		0.4846	0.4846		0.4721	0.4721		3,578.3286	3,578.3286	0.5986		3,593.2923
Total	**1.5981**	**12.0468**	**17.5585**	**0.0374**		**0.4846**	**0.4846**		**0.4721**	**0.4721**		**3,578.3286**	**3,578.3286**	**0.5986**		**3,593.2923**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 4 Bridge Gap Concrete - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.6500e-003	0.6147	0.1823	2.6000e-003	0.0833	5.2100e-003	0.0885	0.0228	4.9800e-003	0.0278		290.2952	290.2952	0.0178	0.0463	304.5386
Vendor	9.7500e-003	0.4003	0.1440	1.7200e-003	0.0613	2.3400e-003	0.0636	0.0176	2.2400e-003	0.0199		186.7693	186.7693	6.6800e-003	0.0271	194.9982
Worker	0.1591	0.0906	1.2701	4.6400e-003	0.6387	2.7100e-003	0.6414	0.1694	2.4900e-003	0.1719		491.3691	491.3691	8.8200e-003	0.0107	494.7671
Total	**0.1785**	**1.1056**	**1.5964**	**8.9600e-003**	**0.7832**	**0.0103**	**0.7935**	**0.2098**	**9.7100e-003**	**0.2195**		**968.4335**	**968.4335**	**0.0333**	**0.0840**	**994.3039**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5981	12.0468	17.5585	0.0374		0.4846	0.4846		0.4721	0.4721	0.0000	3,578.3286	3,578.3286	0.5986		3,593.2923
Total	**1.5981**	**12.0468**	**17.5585**	**0.0374**		**0.4846**	**0.4846**		**0.4721**	**0.4721**	**0.0000**	**3,578.3286**	**3,578.3286**	**0.5986**		**3,593.2923**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 4 Bridge Gap Concrete - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.6500e-003	0.6147	0.1823	2.6000e-003	0.0833	5.2100e-003	0.0885	0.0228	4.9800e-003	0.0278		290.2952	290.2952	0.0178	0.0463	304.5386
Vendor	9.7500e-003	0.4003	0.1440	1.7200e-003	0.0613	2.3400e-003	0.0636	0.0176	2.2400e-003	0.0199		186.7693	186.7693	6.6800e-003	0.0271	194.9982
Worker	0.1591	0.0906	1.2701	4.6400e-003	0.6387	2.7100e-003	0.6414	0.1694	2.4900e-003	0.1719		491.3691	491.3691	8.8200e-003	0.0107	494.7671
Total	**0.1785**	**1.1056**	**1.5964**	**8.9600e-003**	**0.7832**	**0.0103**	**0.7935**	**0.2098**	**9.7100e-003**	**0.2195**		**968.4335**	**968.4335**	**0.0333**	**0.0840**	**994.3039**

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.568480	0.062094	0.174123	0.115064	0.023357	0.006399	0.009361	0.006325	0.000693	0.000596	0.028205	0.000919	0.004383

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Unmitigated	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117

Camino Del Mar Bridge Replacement Stage 4 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	9.5200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0177					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7000e-004	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**		**0.0117**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	9.5200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0177					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7000e-004	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**		**0.0117**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Camino Del Mar Bridge Replacement Stage 5

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	50.00	1000sqft	1.15	50,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2027
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - This model is for construction impacts only.

Land Use - Land use area is approximate footprint of construction area and is not used in model calculations.

Construction Phase - Construction schedule per project engineers.

Off-road Equipment -

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.
Off-Highway Trucks = pavement striping truck.

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.

Trips and VMT - Trips based on equipment estimates, stage activity and material requirements.

Grading -

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Architectural Coating - Traffic marking VOC content limit per SDAPCD 67.0.1, effective January 1, 2022.

Construction Off-road Equipment Mitigation - Fugitive dust mitigation to meet SDAPCD Rule 55 requirements.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Parking	250.00	100.00
tblConstructionPhase	NumDays	4.00	14.00
tblConstructionPhase	NumDays	200.00	12.00
tblConstructionPhase	NumDays	10.00	2.00
tblConstructionPhase	NumDays	200.00	20.00
tblConstructionPhase	NumDays	2.00	18.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	10.00	50.00
tblTripsAndVMT	WorkerTripNumber	8.00	50.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00
tblTripsAndVMT	WorkerTripNumber	4.00	20.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2026	0.0394	0.2866	0.3488	8.7000e-004	0.0276	0.0107	0.0382	6.7900e-003	0.0102	0.0169	0.0000	78.0544	78.0544	0.0114	2.0300e-003	78.9445
Maximum	**0.0394**	**0.2866**	**0.3488**	**8.7000e-004**	**0.0276**	**0.0107**	**0.0382**	**6.7900e-003**	**0.0102**	**0.0169**	**0.0000**	**78.0544**	**78.0544**	**0.0114**	**2.0300e-003**	**78.9445**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2026	0.0394	0.2866	0.3488	8.7000e-004	0.0255	0.0107	0.0362	6.5700e-003	0.0102	0.0167	0.0000	78.0543	78.0543	0.0114	2.0300e-003	78.9445
Maximum	**0.0394**	**0.2866**	**0.3488**	**8.7000e-004**	**0.0255**	**0.0107**	**0.0362**	**6.5700e-003**	**0.0102**	**0.0167**	**0.0000**	**78.0543**	**78.0543**	**0.0114**	**2.0300e-003**	**78.9445**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**7.44**	**0.00**	**5.33**	**3.24**	**0.00**	**1.30**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2026	8-31-2026	0.3228	0.3228
		Highest	0.3228	0.3228

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Stage 5 Final Contour Grading	Grading	6/1/2026	6/18/2026	5	14	
2	Stage 5 Signage Installation	Building Construction	6/19/2026	7/6/2026	5	12	
3	Stage 5 Final Pavement Striping	Architectural Coating	7/7/2026	7/8/2026	5	2	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4	Stage 5 Water Lines and Runoff Devices	Building Construction	7/9/2026	8/5/2026	5	20	
5	Stage 5 Cleanup and Demobilization	Site Preparation	8/6/2026	8/31/2026	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 7

Acres of Paving: 1.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 3,000 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Stage 5 Cleanup and Demobilization	Cranes	1	8.00	231	0.29
Stage 5 Cleanup and Demobilization	Generator Sets	1	8.00	84	0.74
Stage 5 Cleanup and Demobilization	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 5 Cleanup and Demobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 5 Final Contour Grading	Crawler Tractors	1	8.00	212	0.43
Stage 5 Final Contour Grading	Generator Sets	1	8.00	84	0.74
Stage 5 Final Contour Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 5 Signage Installation	Cranes	1	8.00	231	0.29
Stage 5 Signage Installation	Generator Sets	1	8.00	84	0.74
Stage 5 Signage Installation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 5 Water Lines and Runoff Devices	Air Compressors	1	8.00	78	0.48
Stage 5 Water Lines and Runoff Devices	Cranes	1	8.00	231	0.29
Stage 5 Water Lines and Runoff Devices	Generator Sets	1	8.00	84	0.74
Stage 5 Water Lines and Runoff Devices	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 5 Final Pavement Striping	Air Compressors	1	8.00	78	0.48
Stage 5 Final Pavement Striping	Off-Highway Trucks	1	8.00	402	0.38

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Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Stage 5 Cleanup and Demobilization	4	50.00	10.00	200.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 5 Final Contour Grading	3	50.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 5 Signage Installation	3	50.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 5 Water Lines and Runoff Devices	4	50.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 5 Final Pavement Striping	2	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Stage 5 Final Contour Grading - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.7100e-003	0.0000	3.7100e-003	4.0000e-004	0.0000	4.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.4100e-003	0.0538	0.0560	1.2000e-004		2.1300e-003	2.1300e-003		2.0100e-003	2.0100e-003	0.0000	10.6898	10.6898	2.3200e-003	0.0000	10.7479
Total	**5.4100e-003**	**0.0538**	**0.0560**	**1.2000e-004**	**3.7100e-003**	**2.1300e-003**	**5.8400e-003**	**4.0000e-004**	**2.0100e-003**	**2.4100e-003**	**0.0000**	**10.6898**	**10.6898**	**2.3200e-003**	**0.0000**	**10.7479**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 5 Final Contour Grading - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0000e-005	2.8100e-003	1.0000e-003	1.0000e-005	4.2000e-004	2.0000e-005	4.4000e-004	1.2000e-004	2.0000e-005	1.4000e-004	0.0000	1.2099	1.2099	4.0000e-005	1.8000e-004	1.2631
Worker	1.0500e-003	6.8000e-004	9.4200e-003	3.0000e-005	4.3600e-003	2.0000e-005	4.3800e-003	1.1600e-003	2.0000e-005	1.1800e-003	0.0000	3.2176	3.2176	6.0000e-005	7.0000e-005	3.2401
Total	**1.1200e-003**	**3.4900e-003**	**0.0104**	**4.0000e-005**	**4.7800e-003**	**4.0000e-005**	**4.8200e-003**	**1.2800e-003**	**4.0000e-005**	**1.3200e-003**	**0.0000**	**4.4275**	**4.4275**	**1.0000e-004**	**2.5000e-004**	**4.5033**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.6700e-003	0.0000	1.6700e-003	1.8000e-004	0.0000	1.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.4100e-003	0.0538	0.0560	1.2000e-004		2.1300e-003	2.1300e-003		2.0100e-003	2.0100e-003	0.0000	10.6898	10.6898	2.3200e-003	0.0000	10.7479
Total	**5.4100e-003**	**0.0538**	**0.0560**	**1.2000e-004**	**1.6700e-003**	**2.1300e-003**	**3.8000e-003**	**1.8000e-004**	**2.0100e-003**	**2.1900e-003**	**0.0000**	**10.6898**	**10.6898**	**2.3200e-003**	**0.0000**	**10.7479**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 5 Final Contour Grading - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0000e-005	2.8100e-003	1.0000e-003	1.0000e-005	4.2000e-004	2.0000e-005	4.4000e-004	1.2000e-004	2.0000e-005	1.4000e-004	0.0000	1.2099	1.2099	4.0000e-005	1.8000e-004	1.2631
Worker	1.0500e-003	6.8000e-004	9.4200e-003	3.0000e-005	4.3600e-003	2.0000e-005	4.3800e-003	1.1600e-003	2.0000e-005	1.1800e-003	0.0000	3.2176	3.2176	6.0000e-005	7.0000e-005	3.2401
Total	**1.1200e-003**	**3.4900e-003**	**0.0104**	**4.0000e-005**	**4.7800e-003**	**4.0000e-005**	**4.8200e-003**	**1.2800e-003**	**4.0000e-005**	**1.3200e-003**	**0.0000**	**4.4275**	**4.4275**	**1.0000e-004**	**2.5000e-004**	**4.5033**

3.3 Stage 5 Signage Installation - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.2700e-003	0.0414	0.0458	9.0000e-005		1.7000e-003	1.7000e-003		1.6100e-003	1.6100e-003	0.0000	8.0771	8.0771	1.6400e-003	0.0000	8.1181
Total	**4.2700e-003**	**0.0414**	**0.0458**	**9.0000e-005**		**1.7000e-003**	**1.7000e-003**		**1.6100e-003**	**1.6100e-003**	**0.0000**	**8.0771**	**8.0771**	**1.6400e-003**	**0.0000**	**8.1181**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 5 Signage Installation - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0000e-005	2.4100e-003	8.6000e-004	1.0000e-005	3.6000e-004	1.0000e-005	3.7000e-004	1.0000e-004	1.0000e-005	1.2000e-004	0.0000	1.0370	1.0370	4.0000e-005	1.5000e-004	1.0827
Worker	9.0000e-004	5.8000e-004	8.0800e-003	3.0000e-005	3.7400e-003	2.0000e-005	3.7600e-003	9.9000e-004	2.0000e-005	1.0100e-003	0.0000	2.7580	2.7580	5.0000e-005	6.0000e-005	2.7772
Total	**9.6000e-004**	**2.9900e-003**	**8.9400e-003**	**4.0000e-005**	**4.1000e-003**	**3.0000e-005**	**4.1300e-003**	**1.0900e-003**	**3.0000e-005**	**1.1300e-003**	**0.0000**	**3.7950**	**3.7950**	**9.0000e-005**	**2.1000e-004**	**3.8599**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.2700e-003	0.0414	0.0458	9.0000e-005		1.7000e-003	1.7000e-003		1.6100e-003	1.6100e-003	0.0000	8.0771	8.0771	1.6400e-003	0.0000	8.1181
Total	**4.2700e-003**	**0.0414**	**0.0458**	**9.0000e-005**		**1.7000e-003**	**1.7000e-003**		**1.6100e-003**	**1.6100e-003**	**0.0000**	**8.0771**	**8.0771**	**1.6400e-003**	**0.0000**	**8.1181**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 5 Signage Installation - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0000e-005	2.4100e-003	8.6000e-004	1.0000e-005	3.6000e-004	1.0000e-005	3.7000e-004	1.0000e-004	1.0000e-005	1.2000e-004	0.0000	1.0370	1.0370	4.0000e-005	1.5000e-004	1.0827
Worker	9.0000e-004	5.8000e-004	8.0800e-003	3.0000e-005	3.7400e-003	2.0000e-005	3.7600e-003	9.9000e-004	2.0000e-005	1.0100e-003	0.0000	2.7580	2.7580	5.0000e-005	6.0000e-005	2.7772
Total	**9.6000e-004**	**2.9900e-003**	**8.9400e-003**	**4.0000e-005**	**4.1000e-003**	**3.0000e-005**	**4.1300e-003**	**1.0900e-003**	**3.0000e-005**	**1.1300e-003**	**0.0000**	**3.7950**	**3.7950**	**9.0000e-005**	**2.1000e-004**	**3.8599**

3.4 Stage 5 Final Pavement Striping - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.1000e-004	4.3900e-003	5.6000e-003	2.0000e-005		1.7000e-004	1.7000e-004		1.6000e-004	1.6000e-004	0.0000	1.5013	1.5013	3.9000e-004	0.0000	1.5112
Total	**7.6600e-003**	**4.3900e-003**	**5.6000e-003**	**2.0000e-005**		**1.7000e-004**	**1.7000e-004**		**1.6000e-004**	**1.6000e-004**	**0.0000**	**1.5013**	**1.5013**	**3.9000e-004**	**0.0000**	**1.5112**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Stage 5 Final Pavement Striping - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	4.0000e-005	5.4000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.1839	0.1839	0.0000	0.0000	0.1852
Total	**6.0000e-005**	**4.0000e-005**	**5.4000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.1839**	**0.1839**	**0.0000**	**0.0000**	**0.1852**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.1000e-004	4.3900e-003	5.6000e-003	2.0000e-005		1.7000e-004	1.7000e-004		1.6000e-004	1.6000e-004	0.0000	1.5013	1.5013	3.9000e-004	0.0000	1.5112
Total	**7.6600e-003**	**4.3900e-003**	**5.6000e-003**	**2.0000e-005**		**1.7000e-004**	**1.7000e-004**		**1.6000e-004**	**1.6000e-004**	**0.0000**	**1.5013**	**1.5013**	**3.9000e-004**	**0.0000**	**1.5112**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Stage 5 Final Pavement Striping - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	4.0000e-005	5.4000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.1839	0.1839	0.0000	0.0000	0.1852
Total	**6.0000e-005**	**4.0000e-005**	**5.4000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.1839**	**0.1839**	**0.0000**	**0.0000**	**0.1852**

3.5 Stage 5 Water Lines and Runoff Devices - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.3900e-003	0.0843	0.1004	1.9000e-004		3.5300e-003	3.5300e-003		3.3800e-003	3.3800e-003	0.0000	16.8662	16.8662	2.9200e-003	0.0000	16.9392
Total	**9.3900e-003**	**0.0843**	**0.1004**	**1.9000e-004**		**3.5300e-003**	**3.5300e-003**		**3.3800e-003**	**3.3800e-003**	**0.0000**	**16.8662**	**16.8662**	**2.9200e-003**	**0.0000**	**16.9392**

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3.5 Stage 5 Water Lines and Runoff Devices - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-004	4.0200e-003	1.4300e-003	2.0000e-005	6.0000e-004	2.0000e-005	6.2000e-004	1.7000e-004	2.0000e-005	2.0000e-004	0.0000	1.7284	1.7284	6.0000e-005	2.5000e-004	1.8045
Worker	1.5000e-003	9.7000e-004	0.0135	5.0000e-005	6.2300e-003	3.0000e-005	6.2600e-003	1.6600e-003	3.0000e-005	1.6800e-003	0.0000	4.5966	4.5966	9.0000e-005	1.0000e-004	4.6287
Total	**1.6000e-003**	**4.9900e-003**	**0.0149**	**7.0000e-005**	**6.8300e-003**	**5.0000e-005**	**6.8800e-003**	**1.8300e-003**	**5.0000e-005**	**1.8800e-003**	**0.0000**	**6.3250**	**6.3250**	**1.5000e-004**	**3.5000e-004**	**6.4332**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.3900e-003	0.0843	0.1004	1.9000e-004		3.5300e-003	3.5300e-003		3.3800e-003	3.3800e-003	0.0000	16.8662	16.8662	2.9200e-003	0.0000	16.9392
Total	**9.3900e-003**	**0.0843**	**0.1004**	**1.9000e-004**		**3.5300e-003**	**3.5300e-003**		**3.3800e-003**	**3.3800e-003**	**0.0000**	**16.8662**	**16.8662**	**2.9200e-003**	**0.0000**	**16.9392**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Stage 5 Water Lines and Runoff Devices - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-004	4.0200e-003	1.4300e-003	2.0000e-005	6.0000e-004	2.0000e-005	6.2000e-004	1.7000e-004	2.0000e-005	2.0000e-004	0.0000	1.7284	1.7284	6.0000e-005	2.5000e-004	1.8045
Worker	1.5000e-003	9.7000e-004	0.0135	5.0000e-005	6.2300e-003	3.0000e-005	6.2600e-003	1.6600e-003	3.0000e-005	1.6800e-003	0.0000	4.5966	4.5966	9.0000e-005	1.0000e-004	4.6287
Total	**1.6000e-003**	**4.9900e-003**	**0.0149**	**7.0000e-005**	**6.8300e-003**	**5.0000e-005**	**6.8800e-003**	**1.8300e-003**	**5.0000e-005**	**1.8800e-003**	**0.0000**	**6.3250**	**6.3250**	**1.5000e-004**	**3.5000e-004**	**6.4332**

3.6 Stage 5 Cleanup and Demobilization - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2700e-003	0.0737	0.0892	1.7000e-004		2.8800e-003	2.8800e-003		2.7200e-003	2.7200e-003	0.0000	14.8404	14.8404	3.3400e-003	0.0000	14.9239
Total	**7.2700e-003**	**0.0737**	**0.0892**	**1.7000e-004**	**0.0000**	**2.8800e-003**	**2.8800e-003**	**0.0000**	**2.7200e-003**	**2.7200e-003**	**0.0000**	**14.8404**	**14.8404**	**3.3400e-003**	**0.0000**	**14.9239**

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3.6 Stage 5 Cleanup and Demobilization - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.1000e-004	0.0131	3.7600e-003	6.0000e-005	1.7100e-003	1.1000e-004	1.8200e-003	4.7000e-004	1.1000e-004	5.8000e-004	0.0000	5.6558	5.6558	3.3000e-004	9.0000e-004	5.9327
Vendor	9.0000e-005	3.6100e-003	1.2900e-003	2.0000e-005	5.4000e-004	2.0000e-005	5.6000e-004	1.6000e-004	2.0000e-005	1.8000e-004	0.0000	1.5556	1.5556	5.0000e-005	2.3000e-004	1.6240
Worker	1.3500e-003	8.7000e-004	0.0121	4.0000e-005	5.6100e-003	3.0000e-005	5.6400e-003	1.4900e-003	2.0000e-005	1.5100e-003	0.0000	4.1369	4.1369	8.0000e-005	9.0000e-005	4.1659
Total	**1.6500e-003**	**0.0176**	**0.0172**	**1.2000e-004**	**7.8600e-003**	**1.6000e-004**	**8.0200e-003**	**2.1200e-003**	**1.5000e-004**	**2.2700e-003**	**0.0000**	**11.3482**	**11.3482**	**4.6000e-004**	**1.2200e-003**	**11.7226**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2700e-003	0.0737	0.0892	1.7000e-004		2.8800e-003	2.8800e-003		2.7200e-003	2.7200e-003	0.0000	14.8404	14.8404	3.3400e-003	0.0000	14.9239
Total	**7.2700e-003**	**0.0737**	**0.0892**	**1.7000e-004**	**0.0000**	**2.8800e-003**	**2.8800e-003**	**0.0000**	**2.7200e-003**	**2.7200e-003**	**0.0000**	**14.8404**	**14.8404**	**3.3400e-003**	**0.0000**	**14.9239**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 5 Cleanup and Demobilization - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.1000e-004	0.0131	3.7600e-003	6.0000e-005	1.7100e-003	1.1000e-004	1.8200e-003	4.7000e-004	1.1000e-004	5.8000e-004	0.0000	5.6558	5.6558	3.3000e-004	9.0000e-004	5.9327
Vendor	9.0000e-005	3.6100e-003	1.2900e-003	2.0000e-005	5.4000e-004	2.0000e-005	5.6000e-004	1.6000e-004	2.0000e-005	1.8000e-004	0.0000	1.5556	1.5556	5.0000e-005	2.3000e-004	1.6240
Worker	1.3500e-003	8.7000e-004	0.0121	4.0000e-005	5.6100e-003	3.0000e-005	5.6400e-003	1.4900e-003	2.0000e-005	1.5100e-003	0.0000	4.1369	4.1369	8.0000e-005	9.0000e-005	4.1659
Total	**1.6500e-003**	**0.0176**	**0.0172**	**1.2000e-004**	**7.8600e-003**	**1.6000e-004**	**8.0200e-003**	**2.1200e-003**	**1.5000e-004**	**2.2700e-003**	**0.0000**	**11.3482**	**11.3482**	**4.6000e-004**	**1.2200e-003**	**11.7226**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.568480	0.062094	0.174123	0.115064	0.023357	0.006399	0.009361	0.006325	0.000693	0.000596	0.028205	0.000919	0.004383

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Unmitigated	5.0100e-003	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	4.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9000e-004	8.9000e-004	0.0000	0.0000	9.5000e-004
Total	**5.0100e-003**	**0.0000**	**4.6000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.9000e-004**	**8.9000e-004**	**0.0000**	**0.0000**	**9.5000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Camino Del Mar Bridge Replacement Stage 5

San Diego County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	50.00	1000sqft	1.15	50,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2027
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - This model is for construction impacts only.

Land Use - Land use area is approximate footprint of construction area and is not used in model calculations.

Construction Phase - Construction schedule per project engineers.

Off-road Equipment -

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.
Off-Highway Trucks = pavement striping truck.

Off-road Equipment - Equipment estimate per project engineers.

Off-road Equipment - Equipment estimate per project engineers.

Trips and VMT - Trips based on equipment estimates, stage activity and material requirements.

Grading -

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Architectural Coating - Traffic marking VOC content limit per SDAPCD 67.0.1, effective January 1, 2022.

Construction Off-road Equipment Mitigation - Fugitive dust mitigation to meet SDAPCD Rule 55 requirements.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Parking	250.00	100.00
tblConstructionPhase	NumDays	4.00	14.00
tblConstructionPhase	NumDays	200.00	12.00
tblConstructionPhase	NumDays	10.00	2.00
tblConstructionPhase	NumDays	200.00	20.00
tblConstructionPhase	NumDays	2.00	18.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	VendorTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	10.00	50.00
tblTripsAndVMT	WorkerTripNumber	8.00	50.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00
tblTripsAndVMT	WorkerTripNumber	21.00	50.00
tblTripsAndVMT	WorkerTripNumber	4.00	20.00

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2026	7.7249	10.1426	11.8175	0.0317	1.2302	0.3581	1.5393	0.2443	0.3426	0.5591	0.0000	3,203.6778	3,203.6778	0.4660	0.1493	3,259.8322
Maximum	**7.7249**	**10.1426**	**11.8175**	**0.0317**	**1.2302**	**0.3581**	**1.5393**	**0.2443**	**0.3426**	**0.5591**	**0.0000**	**3,203.6778**	**3,203.6778**	**0.4660**	**0.1493**	**3,259.8322**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2026	7.7249	10.1426	11.8175	0.0317	0.9385	0.3581	1.2477	0.2403	0.3426	0.5591	0.0000	3,203.6778	3,203.6778	0.4660	0.1493	3,259.8322
Maximum	**7.7249**	**10.1426**	**11.8175**	**0.0317**	**0.9385**	**0.3581**	**1.2477**	**0.2403**	**0.3426**	**0.5591**	**0.0000**	**3,203.6778**	**3,203.6778**	**0.4660**	**0.1493**	**3,259.8322**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**23.71**	**0.00**	**18.95**	**1.63**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**	**0.0000**	**0.0117**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**	**0.0000**	**0.0117**

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Stage 5 Final Contour Grading	Grading	6/1/2026	6/18/2026	5	14	
2	Stage 5 Signage Installation	Building Construction	6/19/2026	7/6/2026	5	12	
3	Stage 5 Final Pavement Striping	Architectural Coating	7/7/2026	7/8/2026	5	2	
4	Stage 5 Water Lines and Runoff Devices	Building Construction	7/9/2026	8/5/2026	5	20	
5	Stage 5 Cleanup and Demobilization	Site Preparation	8/6/2026	8/31/2026	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 7

Acres of Paving: 1.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 3,000 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Stage 5 Cleanup and Demobilization	Cranes	1	8.00	231	0.29
Stage 5 Cleanup and Demobilization	Generator Sets	1	8.00	84	0.74
Stage 5 Cleanup and Demobilization	Rough Terrain Forklifts	1	8.00	100	0.40
Stage 5 Cleanup and Demobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 5 Final Contour Grading	Crawler Tractors	1	8.00	212	0.43
Stage 5 Final Contour Grading	Generator Sets	1	8.00	84	0.74

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Stage 5 Final Contour Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 5 Signage Installation	Cranes	1	8.00	231	0.29
Stage 5 Signage Installation	Generator Sets	1	8.00	84	0.74
Stage 5 Signage Installation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 5 Water Lines and Runoff Devices	Air Compressors	1	8.00	78	0.48
Stage 5 Water Lines and Runoff Devices	Cranes	1	8.00	231	0.29
Stage 5 Water Lines and Runoff Devices	Generator Sets	1	8.00	84	0.74
Stage 5 Water Lines and Runoff Devices	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Stage 5 Final Pavement Striping	Air Compressors	1	8.00	78	0.48
Stage 5 Final Pavement Striping	Off-Highway Trucks	1	8.00	402	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Stage 5 Cleanup and Demobilization	4	50.00	10.00	200.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 5 Final Contour Grading	3	50.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 5 Signage Installation	3	50.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 5 Water Lines and Runoff Devices	4	50.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Stage 5 Final Pavement Striping	2	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 5 Final Contour Grading - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5303	0.0000	0.5303	0.0573	0.0000	0.0573			0.0000			0.0000
Off-Road	0.7722	7.6882	7.9929	0.0175		0.3039	0.3039		0.2873	0.2873		1,683.3589	1,683.3589	0.3660		1,692.5077
Total	**0.7722**	**7.6882**	**7.9929**	**0.0175**	**0.5303**	**0.3039**	**0.8342**	**0.0573**	**0.2873**	**0.3445**		**1,683.3589**	**1,683.3589**	**0.3660**		**1,692.5077**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.1675	0.0989	1.3399	4.7800e-003	0.6387	2.8700e-003	0.6415	0.1694	2.6400e-003	0.1720		502.2138	502.2138	9.6300e-003	0.0112	505.8020
Total	**0.1775**	**0.5034**	**1.4854**	**6.5400e-003**	**0.6999**	**5.2300e-003**	**0.7052**	**0.1870**	**4.9000e-003**	**0.1919**		**692.9220**	**692.9220**	**0.0162**	**0.0389**	**704.9071**

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Stage 5 Final Contour Grading - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2386	0.0000	0.2386	0.0258	0.0000	0.0258			0.0000			0.0000
Off-Road	0.7722	7.6882	7.9929	0.0175		0.3039	0.3039		0.2873	0.2873	0.0000	1,683.3589	1,683.3589	0.3660		1,692.5077
Total	**0.7722**	**7.6882**	**7.9929**	**0.0175**	**0.2386**	**0.3039**	**0.5426**	**0.0258**	**0.2873**	**0.3130**	**0.0000**	**1,683.3589**	**1,683.3589**	**0.3660**		**1,692.5077**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.1675	0.0989	1.3399	4.7800e-003	0.6387	2.8700e-003	0.6415	0.1694	2.6400e-003	0.1720		502.2138	502.2138	9.6300e-003	0.0112	505.8020
Total	**0.1775**	**0.5034**	**1.4854**	**6.5400e-003**	**0.6999**	**5.2300e-003**	**0.7052**	**0.1870**	**4.9000e-003**	**0.1919**		**692.9220**	**692.9220**	**0.0162**	**0.0389**	**704.9071**

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 5 Signage Installation - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7113	6.8985	7.6256	0.0155		0.2841	0.2841		0.2690	0.2690		1,483.9167	1,483.9167	0.3015		1,491.4529
Total	**0.7113**	**6.8985**	**7.6256**	**0.0155**		**0.2841**	**0.2841**		**0.2690**	**0.2690**		**1,483.9167**	**1,483.9167**	**0.3015**		**1,491.4529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.1675	0.0989	1.3399	4.7800e-003	0.6387	2.8700e-003	0.6415	0.1694	2.6400e-003	0.1720		502.2138	502.2138	9.6300e-003	0.0112	505.8020
Total	**0.1775**	**0.5034**	**1.4854**	**6.5400e-003**	**0.6999**	**5.2300e-003**	**0.7052**	**0.1870**	**4.9000e-003**	**0.1919**		**692.9220**	**692.9220**	**0.0162**	**0.0389**	**704.9071**

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Stage 5 Signage Installation - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7113	6.8985	7.6256	0.0155		0.2841	0.2841		0.2690	0.2690	0.0000	1,483.9167	1,483.9167	0.3015		1,491.4529
Total	**0.7113**	**6.8985**	**7.6256**	**0.0155**		**0.2841**	**0.2841**		**0.2690**	**0.2690**	**0.0000**	**1,483.9167**	**1,483.9167**	**0.3015**		**1,491.4529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.1675	0.0989	1.3399	4.7800e-003	0.6387	2.8700e-003	0.6415	0.1694	2.6400e-003	0.1720		502.2138	502.2138	9.6300e-003	0.0112	505.8020
Total	**0.1775**	**0.5034**	**1.4854**	**6.5400e-003**	**0.6999**	**5.2300e-003**	**0.7052**	**0.1870**	**4.9000e-003**	**0.1919**		**692.9220**	**692.9220**	**0.0162**	**0.0389**	**704.9071**

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Stage 5 Final Pavement Striping - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.9525					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.7054	4.3934	5.5977	0.0172		0.1711	0.1711		0.1629	0.1629		1,654.9395	1,654.9395	0.4343		1,665.7981
Total	**7.6579**	**4.3934**	**5.5977**	**0.0172**		**0.1711**	**0.1711**		**0.1629**	**0.1629**		**1,654.9395**	**1,654.9395**	**0.4343**		**1,665.7981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0670	0.0396	0.5360	1.9100e-003	0.2555	1.1500e-003	0.2566	0.0678	1.0600e-003	0.0688		200.8855	200.8855	3.8500e-003	4.4900e-003	202.3208
Total	**0.0670**	**0.0396**	**0.5360**	**1.9100e-003**	**0.2555**	**1.1500e-003**	**0.2566**	**0.0678**	**1.0600e-003**	**0.0688**		**200.8855**	**200.8855**	**3.8500e-003**	**4.4900e-003**	**202.3208**

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Stage 5 Final Pavement Striping - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.9525					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.7054	4.3934	5.5977	0.0172		0.1711	0.1711		0.1629	0.1629	0.0000	1,654.9395	1,654.9395	0.4343		1,665.7981
Total	**7.6579**	**4.3934**	**5.5977**	**0.0172**		**0.1711**	**0.1711**		**0.1629**	**0.1629**	**0.0000**	**1,654.9395**	**1,654.9395**	**0.4343**		**1,665.7981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0670	0.0396	0.5360	1.9100e-003	0.2555	1.1500e-003	0.2566	0.0678	1.0600e-003	0.0688		200.8855	200.8855	3.8500e-003	4.4900e-003	202.3208
Total	**0.0670**	**0.0396**	**0.5360**	**1.9100e-003**	**0.2555**	**1.1500e-003**	**0.2566**	**0.0678**	**1.0600e-003**	**0.0688**		**200.8855**	**200.8855**	**3.8500e-003**	**4.4900e-003**	**202.3208**

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Stage 5 Water Lines and Runoff Devices - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9392	8.4258	10.0378	0.0194		0.3528	0.3528		0.3377	0.3377		1,859.1807	1,859.1807	0.3219		1,867.2287
Total	**0.9392**	**8.4258**	**10.0378**	**0.0194**		**0.3528**	**0.3528**		**0.3377**	**0.3377**		**1,859.1807**	**1,859.1807**	**0.3219**		**1,867.2287**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.1675	0.0989	1.3399	4.7800e-003	0.6387	2.8700e-003	0.6415	0.1694	2.6400e-003	0.1720		502.2138	502.2138	9.6300e-003	0.0112	505.8020
Total	**0.1775**	**0.5034**	**1.4854**	**6.5400e-003**	**0.6999**	**5.2300e-003**	**0.7052**	**0.1870**	**4.9000e-003**	**0.1919**		**692.9220**	**692.9220**	**0.0162**	**0.0389**	**704.9071**

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Stage 5 Water Lines and Runoff Devices - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9392	8.4258	10.0378	0.0194		0.3528	0.3528		0.3377	0.3377	0.0000	1,859.1807	1,859.1807	0.3219		1,867.2287
Total	**0.9392**	**8.4258**	**10.0378**	**0.0194**		**0.3528**	**0.3528**		**0.3377**	**0.3377**	**0.0000**	**1,859.1807**	**1,859.1807**	**0.3219**		**1,867.2287**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.1675	0.0989	1.3399	4.7800e-003	0.6387	2.8700e-003	0.6415	0.1694	2.6400e-003	0.1720		502.2138	502.2138	9.6300e-003	0.0112	505.8020
Total	**0.1775**	**0.5034**	**1.4854**	**6.5400e-003**	**0.6999**	**5.2300e-003**	**0.7052**	**0.1870**	**4.9000e-003**	**0.1919**		**692.9220**	**692.9220**	**0.0162**	**0.0389**	**704.9071**

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 5 Cleanup and Demobilization - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.8083	8.1828	9.9112	0.0189		0.3202	0.3202		0.3022	0.3022		1,817.6342	1,817.6342	0.4094		1,827.8687
Total	**0.8083**	**8.1828**	**9.9112**	**0.0189**	**0.0000**	**0.3202**	**0.3202**	**0.0000**	**0.3022**	**0.3022**		**1,817.6342**	**1,817.6342**	**0.4094**		**1,827.8687**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0228	1.4563	0.4210	6.2200e-003	0.1944	0.0123	0.2066	0.0533	0.0117	0.0650		693.1217	693.1217	0.0405	0.1105	727.0564
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.1675	0.0989	1.3399	4.7800e-003	0.6387	2.8700e-003	0.6415	0.1694	2.6400e-003	0.1720		502.2138	502.2138	9.6300e-003	0.0112	505.8020
Total	**0.2003**	**1.9597**	**1.9064**	**0.0128**	**0.8943**	**0.0175**	**0.9118**	**0.2403**	**0.0166**	**0.2569**		**1,386.0437**	**1,386.0437**	**0.0566**	**0.1493**	**1,431.9635**

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Stage 5 Cleanup and Demobilization - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.8083	8.1828	9.9112	0.0189		0.3202	0.3202		0.3022	0.3022	0.0000	1,817.6342	1,817.6342	0.4094		1,827.8687
Total	**0.8083**	**8.1828**	**9.9112**	**0.0189**	**0.0000**	**0.3202**	**0.3202**	**0.0000**	**0.3022**	**0.3022**	**0.0000**	**1,817.6342**	**1,817.6342**	**0.4094**		**1,827.8687**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0228	1.4563	0.4210	6.2200e-003	0.1944	0.0123	0.2066	0.0533	0.0117	0.0650		693.1217	693.1217	0.0405	0.1105	727.0564
Vendor	9.9900e-003	0.4045	0.1455	1.7600e-003	0.0613	2.3600e-003	0.0636	0.0176	2.2600e-003	0.0199		190.7082	190.7082	6.5300e-003	0.0276	199.1051
Worker	0.1675	0.0989	1.3399	4.7800e-003	0.6387	2.8700e-003	0.6415	0.1694	2.6400e-003	0.1720		502.2138	502.2138	9.6300e-003	0.0112	505.8020
Total	**0.2003**	**1.9597**	**1.9064**	**0.0128**	**0.8943**	**0.0175**	**0.9118**	**0.2403**	**0.0166**	**0.2569**		**1,386.0437**	**1,386.0437**	**0.0566**	**0.1493**	**1,431.9635**

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.568480	0.062094	0.174123	0.115064	0.023357	0.006399	0.009361	0.006325	0.000693	0.000596	0.028205	0.000919	0.004383

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Unmitigated	0.0277	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	9.5200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0177					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7000e-004	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**		**0.0117**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	9.5200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0177					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7000e-004	5.0000e-005	5.0900e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0109	0.0109	3.0000e-005		0.0117
Total	**0.0277**	**5.0000e-005**	**5.0900e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0109**	**0.0109**	**3.0000e-005**		**0.0117**

7.0 Water Detail

7.1 Mitigation Measures Water

Camino Del Mar Bridge Replacement Stage 5 - San Diego County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

Biological Resources Letter Report

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942
619.462.1515 **tel**
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www.**helixepi**.com

~~May 3~~December 20, 2022 01391.00002.002

Mr. Tim Thiele, PE, QSD
City Engineer | Michael Baker International
City of Del Mar
1050 Camino Del Mar
Del Mar, CA 92014

Subject: Biological Resources Letter Report for the Camino Del Mar Bridge Replacement Project

Dear Mr. Thiele:

This letter report presents the results of a biological resources technical study conducted by HELIX Environmental Planning, Inc. (HELIX) for the proposed Camino Del Mar Bridge Replacement project (project) located in the City of Del Mar (City), San Diego County, California. This letter report summarizes the existing biological resources within the site and provides an analysis of the proposed project's impacts in accordance with the California Environmental Quality Act (CEQA) and other applicable federal, state, and local policies related to biological resources. The City would be the Lead Agency for the project responsible for conducting the environmental review process under CEQA, ensuring the project is consistent with pertinent federal/state laws and local ordinances.

INTRODUCTION

Project Location

The Camino del Mar Bridge (bridge) is located 1.01 miles west of Interstate (I-) 5, within the City of Del Mar (City) in western San Diego County (Figure 1, *Regional Location*). The project site is situated in Township 14 South, Range 4 West on the U.S. Geological Survey (USGS) 7.5-minute Del Mar quadrangle (Figure 2, *Project Location – USGS*). Specifically, the bridge is located on Camino del Mar, south of Via de la Valle and Border Avenue, north of 23rd Street, and crosses the San Dieguito Lagoon and river mouth with the Pacific Ocean (Figure 3, *Project Location* – Aerial). The project is located in the City's Floodway Zone, ~~and~~ is in the Coastal Zone, and is~~;~~ ~~however, is not within a review area under the National Oceanic and Atmospheric Administration (NOAA). The project is located~~ within the Lagoon Overlay Zone of the City's Local Coastal Program Implementing Ordinances (LCP; City 2001). The project is located in a review area under the National Oceanic and Atmospheric Administration (NOAA).

Project Description

The proposed project involves the demolition of the existing Camino del Mar Bridge No. 57C-0209 and replacement with a new bridge as well as the terminal north and south existing roadway connections to the Camino del Mar roadway. The new bridge design consists of a five-span cast-in-place prestressed concrete box girder bridge with a length span of approximately 624 feet between outer abutments, a width of approximately 68.5 linear feet, comprising an area of approximately 41,800 square feet (0.96 acre). Figure 4, *Project/Bridge Plan View*, depicts the overhead and cross-section views of the proposed replacement bridge. As presented on Figure 4, the proposed bridge foundation would consist of two abutments and four piers supported by columns and piles that would support the bridge. The new bridge would utilize the existing abutments, if determined to be needed by the construction contractor, and riprap would be added to the existing riprap.

In comparison to the existing bridge, the new replacement bridge would be located along the same horizontal alignment, would be slightly longer, wider, and higher, and would result in a reduction in the number of piers in the San Dieguito River Lagoon. The new replacement bridge would provide approximately 29 feet in additional bridge length and an additional 7.5 feet in bridge height near the center of the bridge, which would accommodate a mid-range sea level rise scenario of 38 inches by the year 2100 during a 100-year flood event. Due to the increase in bridge height compared to the existing bridge, the roadway approach zones at the north and south end of the bridge would also require modifications to tie into and accommodate the raised elevation of the bridge. These modifications include reconstructing portions of the road as well as the sidewalks to meet the newly established pedestrian sidewalks on both sides of the replacement bridge.

The additional bridge width of approximately 7.5 feet would accommodate two-way pedestrian and bicycle movement across the bridge. Ultimately, there would be no change in vehicle capacity on the bridge as the existing two-lane Camino del Mar roadway would continue to provide two-vehicle traffic lanes.

Construction Methods and Phasing

The proposed project is estimated to be constructed over 27 months during five distinct construction stages: (1) site preparation; (2) demolition and replacement of the east side; (3) demolition and replacement of the west side; (4) bridge median improvements; and (5) final improvements. With the exception of approximately 12 temporary short-term night closures (one to four nights per construction stage), the contractor would maintain continuous vehicular, pedestrian, and bicycle access along the Camino del Mar bridge throughout construction by shifting travel lanes from one side to another as the bridge is replaced. Bridge demolition and replacement would occur at one half of the bridge at a time, beginning with the east side (lagoon side) followed by the west side (ocean side). During the demolition and replacement of each side of the bridge, the opposite side would be used to re-route both lanes of traffic.

During project construction, a temporary work trestle, consisting of an approximately 50-foot-wide elevated platform that spans the entire Lagoon mouth floodway from each existing abutment, would be installed on each side of the bridge, one side at a time. Cofferdam systems would be required for the removal of existing piers as well as the installation of the new bridge foundations and piers. Temporary falsework would be installed to form and construct the bridge foundations (piers and abutments) and bridge spans. Existing wood pier pilings would be cut/removed to at least one foot below the general

scour depth or entirely removed if they conflict with the new pier/abutment foundations of the replacement bridge. The removal of the existing pilings would occur during the lowest tide periods such that the remnant base portion of the piers would remain subsurface and not exposed above water. Temporary access for construction equipment at the ground level along the beach areas would be required for the installation and removal of the falsework. As a condition of approval of the project, the contractor would be responsible for developing a plan to keep debris out of the lagoon. This may include suspending protective covers from the existing bridge, on the ground below, or floating on the water. The falsework would also serve to protect the lagoon from debris.

Based on the proximity of the project to the San Dieguito River mouth, standard construction operating procedures/commitments and Best Management Practices (BMPs) would be implemented for the protection of sensitive biological resources, as well as water quality, including turbidity. Measures to control sediment and erosion during construction include, but are not limited to: (1) installing silt fences, fiber rolls, mulching or soil binders, plastic covers, and gravel bags in appropriate locations; (2) placing temporary filters at storm drain inlets (e.g., gravel bags/filter fabric); (3) designating containment areas for material storage (e.g., covering/berming of soil stockpiles); (4) providing containment areas for solid waste storage and concrete washout; (5) construction of temporary berms; (6) limiting fueling/maintenance of equipment to designated areas outside and away from waters or wetlands areas; (7) and installing material containment devices for refueling or fixing equipment that is not easily movable away from waters.

Project construction commitments and operating procedures for "in-water" work within the San Dieguito River mouth also would be employed. Such procedures may include, but are not limited to: (1) installing impermeable barriers or turbidity curtains; (2) installing exclusionary fencing to exclude grunion entry into the project work areas between September 1 and February 28; (3) using temporary cofferdams or temporary berms where practicable; (4) employing air bubble curtain technologies or cushion block devices on the pile-driving, hammering, and drilling machinery to reduce vibrations, hydroacoustic, and channel bottom disturbances; (5) limiting the use of hammer-style or pile driver machinery; (6) wrapping pile and hammer drivers with sound blankets; (7) installing vibratory dampeners on driver/hammer heads, where feasible; (8) using electrically powered equipment instead of pneumatic or internal-combustion powered equipment; ~~and~~ (9) scheduling construction within water and wetlands to occur during low tides; and 10) implementing recommendations by reviewing agencies (i.e., CDFW, NOAA, etc.), to be confirmed through consultation as applicable. These measures would be identified on construction documents and implemented as conditions of approval of the project.

As part of these construction commitments, a "worker environmental awareness training" would be conducted at the project site prior to construction for each on-site construction crew member. Additionally, a designated project biologist will conduct regular construction monitoring to monitor environmental compliance and ensure the project construction operating procedures and BMPs are implemented/maintained.

Due to limited on-site construction staging areas, the contractor is anticipated to need additional off-site staging areas for materials, equipment, and office. Several potential staging areas have been identified, all of which are currently developed lands, including the Del Mar State Fairgrounds located at 2260 Jimmy Durante Boulevard to the east of the project site, and the City's Public Works Yard located at 2240 Jimmy Durante Blvd to the southeast of the project site. The Public Works Yard is a City-owned area that is unpaved and relatively flat. This area is typically used for overnight storage of construction equipment and is located at the intersection of San Dieguito Drive and Jimmy Durante Boulevard, just

southeast of the bridge. ~~-~~Both of the potential staging areas are evaluated herein for environmental clearance.

METHODS

Literature Review

Prior to conducting biological surveys, a review of existing literature, previous reports (HELIX 2012 and 2015), and pertinent biological resources databases was conducted to identify the existence or potential occurrence of special-status biological resources (e.g., plants, animals, and vegetation communities) in or within the immediate vicinity of the project site. Database searches included but were not limited to: the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS) online database, the U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Conservation (IPaC) database, the NOAA National Marine Fisheries Service (NMFS) Essential Fish Habitat (EFH) Mapper, and the San Diego Natural History Museum's (SDNHM) San Diego County Plant Atlas online searchable database.

General Biological Surveys

A general biological survey, including vegetation mapping, was conducted for the project site and an approximately 200-foot surrounding area (i.e., study area) by HELIX biologists Jason Kurnow and Stacy Nigro on July 16, 2018 (Table 1, *Survey Information*) to verify and update the previous mapping conducted in 2012, 2013, and 2015 (HELIX 2012, 2015, and 2016). HELIX biologist Angelia Bottiani conducted an additional biological survey of the study area on June 30, 2021, to verify site conditions were consistent with the results of previous studies and to update supporting maps.

Vegetation was mapped on a 1"=150'-scale aerial photograph. The study area was surveyed on foot with the aid of binoculars; observed or detected plant and animal species were recorded in field notes and/or on the aerial photograph. Animal identifications were made in the field by direct, visual observation, or indirectly, by detection of calls, burrows, tracks, or scat. Plant identifications were made in the field or in the lab through comparison with voucher specimens or photographs. Data from the field maps were digitized into a geographic information system using ArcGIS. Comprehensive lists of plant and animal species that were incidentally observed or detected during HELIX's 2015 and 2018 surveys of the project site were generated in the field and are provided in Appendices A and B, respectively. These lists of species identified are not necessarily comprehensive accounts of all species that occur in the study area, as species that are nocturnal, secretive, or seasonally restricted may not have been observed.

Table 1
SURVEY INFORMATION

Survey Date(s)	Personnel	Focus
2018		
January 12	T. Liddicoat	Western snowy plover survey
January 19	T. Liddicoat	Western snowy plover survey
January 25	T. Liddicoat	Western snowy plover survey
March 8	J. Konecny	Belding's Savannah sparrow survey, Ridgway's rail survey
March 16	J. Konecny	Belding's Savannah sparrow survey, Ridgway's rail survey

Survey Date(s)	Personnel	Focus
March 16	K. Bellon	Coastal California gnatcatcher survey
March 23	K. Bellon	Coastal California gnatcatcher survey
March 25	J. Konecny	Ridgway's rail survey
March 30	K. Bellon	Coastal California gnatcatcher survey
April 6	K. Bellon	Coastal California gnatcatcher survey
April 8	J. Konecny	Belding's Savannah sparrow survey, Ridgway's rail survey
April 13	K. Bellon	Coastal California gnatcatcher survey
April 16	J. Kurnow	Rare plant survey
April 20	J. Konecny	Ridgway's rail survey
April 23	K. Bellon	Coastal California gnatcatcher survey
April 23	T. Liddicoat	California least tern survey
April 27	J. Konecny	Ridgway's rail survey
May 14	T. Liddicoat	California least tern survey
May 31	T. Liddicoat	California least tern survey
June 12	T. Liddicoat	California least tern survey
June 18	A. Mattson	Rare plant survey
June 27	T. Liddicoat	California least tern survey
July 11	T. Liddicoat	California least tern survey
July 16	J. Kurnow, S. Nigro	General biological survey, jurisdictional delineation
July 31	T. Liddicoat	California least tern survey
August 14	T. Liddicoat	California least tern survey
September 25	Daniel Kahl	Caulerpa and eelgrass survey
September 26	Daniel Kahl	Caulerpa and eelgrass survey
2021		
June 30	A. Bottiani	Vegetation mapping, waters, general biological survey
2022		
March 6	J. Konecny	Ridgway's rail survey, Belding's Savannah sparrow survey
March 13	J. Konecny	Ridgway's rail survey
March 16	J. Konecny	Belding's Savannah sparrow survey, Coastal California gnatcatcher survey, Snowy plover survey
March 22	J. Konecny	Ridgway's rail survey
March 25	J. Konecny	Belding's Savannah sparrow survey, Coastal California gnatcatcher survey
April 9	J. Konecny	Ridgway's rail survey
April 13	J. Konecny	Belding's Savannah sparrow survey, Coastal California gnatcatcher survey
April 17	J. Konecny	Ridgway's rail survey
April 18~~9~~	J. Konecny	Western snowy plover survey, California least tern survey~~Coastal California gnatcatcher survey, California least tern~~
April 21	J. Konecny	Belding's Savannah sparrow survey, Coastal California gnatcatcher survey
April 28	J. Konecny	Ridgway's rail survey
May 5	J. Konecny	Coastal California gnatcatcher survey
May 12	J. Konecny	Coastal California gnatcatcher survey
May 18	J. Konecny	Western snowy plover survey, California least tern survey

Survey Date(s)	Personnel	Focus
June 15	J. Konecny	Western snowy plover survey, California least tern survey
July 26	J. Kurnow	Rare plant survey

Focused Surveys

Focused surveys for rare plants and sensitive animal species were conducted as part of the biological assessment in 2018. Additional focused surveys for special status animals were conducted in 2022 and are currently in progress. Information on the focused surveys conducted for the project to date is presented in Table 1 above, as well as discussed further below. Rare plants or sensitive animals detected during surveys were mapped directly in the field.

Special-Status Plants

Rare Plant Survey

Focused surveys for rare plants within the study area were conducted ~~on~~ in April ~~16,~~ 2018, by HELIX biologist Jason Kurnow, ~~and~~ in~~on~~ June ~~18,~~ 2018, by HELIX biologist Amy Mattson, and in July 2022 by Jason Kurnow (Table 1). The surveys were performed on foot via meandering transects through potential suitable habitat.

Killer Algae Survey (*Caulerpa taxifolia*)

Focused surveys for killer algae were conducted within appropriate habitat in the study area by Merkel & Associates, Inc. biologist Daniel Kahl. The survey consisted of two visits in September 2018 and were performed per the Caulerpa Control Protocol Version 4.0 (Table 1). Waters below the existing bridge as well as waters within 150 feet of the bridge were surveyed on foot and via snorkeling during low tides (Merkel & Associates, Inc. 2018a).

Eelgrass Survey (*Zostera marina*)

Focused surveys for eelgrass were conducted within appropriate habitat in the study area by Merkel & Associates, Inc. biologist Daniel Kahl. The survey consisted of two visits in September 2018 and were performed per the 2014 NOAA Fisheries California Eelgrass Mitigation Policy and Implementing Guidelines (Table 1). Waters below the existing bridge as well as waters within 150 feet of the bridge were surveyed on foot and via snorkeling during low tides (Merkel & Associates, Inc. 2018b).

Special-Status Animals

Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*)

Focused surveys for the Belding's savannah sparrow (BSS) were conducted for the project site and a 500-foot surrounding radius. Surveys were conducted by HELIX subconsultant John Konecny in 2018 and 2022 (Table 1). Surveys were conducted by meandering and stopping at areas of potentially suitable habitat for BSS. Binoculars were used to aid in the detection and identification of this species. If BSS were observed, additional observation was conducted to evaluate behavior.

California Least Tern (*Sternula antillarum browni*)

Focused surveys were conducted for the California least tern (LETE) were conducted in 2018 by HELIX biologist Thomas Liddicoat and again in 2022 by HELIX subconsultant John Konecny (Table 1). Surveys were performed in appropriate habitat located within a 500-foot radius of the proposed project site. During the surveys, the biologist walked meandering transects along beach habitat within the survey area during various tide levels. Binoculars were used during the surveys to aid in bird detection and identification. If LETE were observed, additional observation was conducted to evaluate behavior.

Coastal California Gnatcatcher (*Polioptila californica californica*)

Focused surveys for the coastal California gnatcatcher (CAGN) were conducted in 2018 and 2022 within appropriate habitat located within a 500-foot radius of the proposed project site by HELIX biologist Katie Bellon (TE778195) and HELIX subconsultant John Konecny (TE837308-6), respectively. The surveys were conducted in accordance with the USFWS survey protocol (1997). Surveys were conducted with binoculars to aid in bird detection, and recorded CAGN vocalizations were played sparingly, and only if other means of detection had failed.

Ridgway's Rail (*Rallus obsoletus*)

Focused surveys for the Ridgway's rail (RIRA) were conducted within appropriate habitat located within a 500-foot radius of the proposed project site. The surveys were conducted by HELIX subconsultant John Konecny (TE837308-6) in 2018 and in 2022 (Table 1). Surveys were conducted in accordance with the recommendations provided to the USFWS by the Clapper Rail Study Team (2009). Surveys were conducted at least seven days apart, split between dawn and dusk, walking within the survey area, and stopping at areas where there was appropriate RIRA habitat and listening for vocalizations. If rails were not detected passively, a digital call-prompt was played.

Western Snowy Plover (*Charadrius nivosus* ssp. *nivosus*)

Surveys were conducted for wintering populations of the western snowy plover (SNPL) within appropriate habitat located within a 500-foot radius of the proposed project site in 2018 and 2022 (Table 1). The surveys were performed by HELIX biologist Thomas Liddicoat (TE139634) in 2018 and John Konecny (TE837308-6) in 2022. Methods were based on the Western Snowy Plover Winter Window Survey Protocol Final Draft (USFWS 2007). The surveys were conducted by walking meandering transects along beach habitat within the survey area during various tide levels. Surveys were conducted with binoculars to aid in bird detection.

Jurisdictional Delineation

HELIX biologists Stacy Nigro and Jason Kurnow conducted a jurisdictional delineation of the project study area in July 2018 (Table 1). The delineation was conducted to verify and update previous delineation fieldwork conducted by HELIX in 2012, 2013, and 2015 (HELIX 2012, 2015, and 2016). Prior to beginning fieldwork, aerial photographs and topographic maps (1"=125' scale) were reviewed to determine the location of potential jurisdictional areas that may be affected by the proposed project.

Areas within and immediately surrounding the project site were evaluated for the presence of potentially jurisdictional waters of the U.S., including wetlands.

If an area was suspected of being a wetland, vegetation and hydrology indicators were noted, and a soil pit was excavated and described. The area was then determined to be a wetland waters of the U.S. if it satisfied the three wetland criteria (i.e., hydrophytic vegetation, wetland hydrology, and hydric soil) described within the Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008). Areas were determined to be non-wetland waters of the U.S. if there was evidence of regular surface flow (e.g., bed and bank), but the vegetation and/or soils criterion were not met.

The upper elevational limits of Section 404 and Section 10 waters were based on elevations provided by the USACE (Robert Smith, pers. comm.). The upper limit of Section 404 waters is the High Tide Line, or 7.12 feet (mean lower low water [MLLW] datum). The Mean High Water, or 4.6 feet (MLLW datum), was used as the upper limit of Section 10 waters. Baseline elevation data reported in NAVD 88 was modified to reflect an elevation using MLLW as the datum.

Pursuant to Division 2, Chapter 6, Sections 1600-1603 of the California Fish and Game Code (CFGC), the CDFW regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake, which supports fish or wildlife. CDFW does not have a specific definition of what constitutes a stream as it relates to regulation under Sections 1600-1603 of the CFGC. In practice, CDFW defines a stream channel as that area where water uniformly or habitually flows over a given course, and where the width of the water course can reasonably be identified by physical or biological indicators. Typically, CDFW jurisdictional habitat includes all riparian shrub or tree canopy, as well as other wetland vegetation and associated habitats that may extend beyond the banks of a stream, river, or lake. CDFW's definition of "lake" includes "natural lakes or man-made reservoirs." Potential CDFW jurisdictional boundaries within the project site were determined based on the presence of riparian vegetation, wetland vegetation, and associated habitats, as well as areas supporting ~~or~~ regular surface flow associated with the San Dieguito River mouth.

Potential California Coastal Commission (CCC) jurisdictional boundaries were determined based on the "one-parameter" definition, which only requires evidence of a single parameter to establish wetland conditions: "Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate" (CCR Title 14, Section 13577).

Nomenclature

Nomenclature for this report is from Baldwin et al. (2012) for plants, Holland (1986) and Oberbauer (2008) for vegetation communities; Society for the Study of Amphibians and Reptiles (SSAR; 2020) for reptiles and amphibians; American Ornithologists' ~~Society~~ Union (AOU 2020) for birds; and Bradley et al. (2014) for mammals. Sensitive plant species status is taken from CNPS (2021). Sensitive animal species status is taken from the CDFW (CDFW 2021a-c).

REGIONAL CONTEXT

The project site is located within the boundaries of the County of San Diego Multiple Species Conservation Program (MSCP 1998). Within the MSCP, the project is in the City of Del Mar Subarea, as

well as the San Dieguito Lagoon Core Area. The City is a local jurisdiction participant in the MSCP but has yet to prepare an approved/adopted Subarea Plan. The project is not within an area targeted for MSCP conservation. Also, the project site does not incorporate areas designated or proposed by the U.S. Fish and Wildlife Service (USFWS) as critical habitat.

RESULTS

General Land Uses

The project site is primarily developed and includes an existing concrete multi-lane roadway bridge and areas immediately surrounding the bridge (see Figures 1 through 3). The bridge serves as an important north-south connection for coastal residents and visitors in the vicinity and the greater San Diego region and is frequently used by motorists, bicyclists, and pedestrians. The bridge is situated between the State Fairgrounds to the east across the lagoon and the Pacific Ocean is immediately to the west of the bridge. A public beach is located adjacent to the west of the bridge. North of the bridge is a tall coastal bluff along the western edge of Camino del Mar that contains passive recreational opportunities within the James G. Scripps Bluff Preserve (Scripps Bluff Preserve). The lagoon extends eastward from the bridge to beyond I-5. The Los Angeles–San Diego–San Luis Obispo (LOSSAN) corridor railroad trestle bridge crossing the San Dieguito River, maintained by the North County Transit District, spans the lagoon parallel to and 500 feet east of the Camino del Mar Bridge. The bridge supports a north-to-south arterial roadway (i.e., Camino del Mar) near coastal destinations and provides access to local beaches, open space areas, hiking trails, the Del Mar Village (the City's central business district), and Torrey Pines State Beach.

Topography and Soils

Topography within the project site (as well as in the immediately surrounding areas) is relatively flat. Elevations of the existing bridge platform surface range from approximately 9 feet above mean sea level (AMSL) at the northern terminus of the bridge, to approximately 15 feet AMSL at the southern terminus of the bridge. Project areas to the north at Via de la Valle and to the south of the bridge near 24th Street are approximately 60 feet AMSL and approximately 13 feet AMSL, respectively.

The project site is generally underlain by an upper layer of Recent Alluvial Deposits (Qa) overlying successive strata of Young Alluvial Deposits (Qya), Young Estuarine Deposits (Qyes), Old Alluvial Deposits (Qoa), and the Del Mar Formation (Td). Based on the review of the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) web soil survey results (accessed May 2020), the surficial deposits at the site consist of lagoon water (LG-W) underneath the existing bridge, Tujunga Sand (TuB) to the south of the bridge, and tidal flats (Tf) to the north of the bridge.

Vegetation Communities and Habitat Types

The project study area, which consists of the project site and immediately surrounding areas, supports 14 different vegetation communities. Existing vegetation communities and habitat types identified and mapped within the study area are shown in Figure 5, *Vegetation Communities and Habitat Types*, and Table 2, *Existing Vegetation Communities and Habitat Types Within the Project Study Area*.

Table 2
EXISTING VEGETATION COMMUNITIES AND HABITAT TYPES WITHIN THE PROJECT STUDY AREA[1]

Vegetation Community or Habitat Type[2]	Acreage
Sensitive	
Alkali Marsh 52300	0.12
Beach 64400	7.26
Diegan Coastal Sage Scrub (including disturbed) 32500	1.69
Estuarine 64130	0.93
Intertidal Area (Open Water) 64112	4.39
Mudflat 64300	0.26
Southern Coastal Bluff Scrub 31200	1.24
Southern Coastal Salt Marsh 52120	1.02
Southern Willow Scrub 63320	0.10
Subtotal	17.01
Non-Sensitive	
Developed 12000	34.72
Disturbed Habitat 11300	0.05
Non-native Vegetation 11000	0.68
Ornamental N/A	0.15
Subtotal	35.60
TOTAL	**52.61**

[1] Acreage rounded to the nearest 0.01.
[2] Vegetation classifications and numerical codes are from Holland (1986) and Oberbauer (2008).

In addition to terrestrial surveys for vegetation, aquatic surveys for killer algae and eelgrass were conducted in 2018 by Merkel & Associates, Inc. at the bridge and within a surrounding 150-foot area, primarily consisting of intertidal open water, mudflat, and estuarine habitats. No killer algae was detected during the surveys. Two relatively small, narrow, and marginal quality eelgrass beds were found within the survey area, located northeast and southeast of the bridge (Merkel & Associates, Inc. 2018a, 2018b).

Alkali Marsh

Alkali marsh is a dense to fairly open growth of perennial grasses and sedges comprised of only a few species. It occurs on permanently moist, alkaline soils. Characteristic species may include yerba mansa (*Anemopsis californica*), sedges (*Carex* spp.), saltgrass (*Distichlis spicata*), and alkali mallow (*Malvella leprosa*; Holland 1986). Within the study area, this vegetation community is dominated by saltgrass and fleshy jaumea (*Jaumea carnosa*). One patch of alkali marsh occurs within the study area northeast of the bridge between Diegan coastal sage scrub and southern coastal salt marsh.

Beach

Beach is sandy and/or cobbly habitat on coastal strands, lagoons, or lakes. Ocean beaches are a shoreline feature of deposited sand formed by waves and tides off the coast. Beaches tend to be unvegetated areas; however, upper portions may be sparsely populated with herbaceous species. Beach is located in the northwestern portion of the study area, west of Camino del Mar. Within the study area, beach is heavily used by the public and is, therefore, unvegetated. In addition, beach habitat to the west of the bridge is open to off-leash dogs and is heavily used by dog owners.

Developed Land

Developed land includes areas that have been constructed upon or otherwise covered with a permanent, unnatural surface and may include, for example, structures, pavement, irrigated landscaping, or hardscape to the extent that no natural land is evident. These areas no longer support native or naturalized vegetation (Oberbauer 2008). Developed lands include paved roads and commercial and residential development in the northern and southern portions of the study area.

Diegan Coastal Sage Scrub (Including Disturbed)

Diegan coastal sage scrub is comprised of low, soft-woody subshrubs that are most active in winter and early spring. Many taxa are facultatively drought-deciduous. It is characterized by California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*) together with laurel sumac (*Malosma laurina*), white sage (*Salvia apiana*), and black sage (*Salvia mellifera*). It often occurs on low moisture-availability sites such as steep, xeric slopes or clay-rich soils that are slow to release stored water. Within the study area, this vegetation community occurs as linear strips on both the western and the eastern sides of the Camino Del Mar roadway and is dominated by California sagebrush and California buckwheat. In the northeastern portion of the study area, there is a patch of disturbed Diegan coastal sage scrub. This disturbed form has sparse shrub cover and a high percentage of non-native herbaceous species relative to the undisturbed form of Diegan coastal sage scrub in the study area.

Disturbed Habitat

Disturbed habitat includes land cleared of vegetation (e.g., dirt roads), land containing a preponderance of non-native plant species such as ornamentals or ruderal exotic species that take advantage of disturbance (previously cleared or abandoned landscaping), or land showing signs of past or present animal usage that removes any capability of providing viable habitat. Disturbed habitat within the study area consists primarily of dirt pathways and previously disturbed lands characterized by bare ground or non-native, weedy vegetation located immediately northwest of the bridge.

Estuarine (Intertidal)

Estuarine habitat consists of periodically and permanently flooded substrates and includes open water portions of semi-enclosed coastal waters where salty water from the ocean mixes with freshwater from the land. The area is open water, but in the intertidal zones, the substrate is exposed during low tides. Estuarine areas are partially enclosed or cut off from the ocean, and may consist of channels, sloughs, and mud and sand flats. River mouths, lagoons, and bays often constitute estuarine habitat. Within the study area, a small patch of estuarine habitat occurs on the east side of the bridge, north of the mouth of the river.

Intertidal Area (Open Water)

Open water habitat consists of open, intertidal water between the beach areas and is generally the area below the observed high tide line. Open water occurs at the central portion of the study area, east and west of the bridge, as well as underneath the bridge.

Mudflat

Mudflats are mostly unvegetated coastal lowlands habitat that are commonly found in sheltered bays or estuaries, interspersed with coastal salt marsh. When mud flats dry out, they may form saltpans. Mudflats in the study area are unvegetated areas with scattered small patches of cord grass (*Spartina foliosa*) and inhabited by fiddler crabs (*Uca crenulata*). Mudflats occur in the northeastern portion of the study area in close association with southern coastal salt marsh and brackish water estuary.

Non-native vegetation

Non-native vegetation is a category describing stands of naturalized trees and shrubs (e.g., acacia [*Acacia* sp.], peppertree [*Schinus* spp.]), many of which originated in landscaping. This vegetation is not irrigated. Characteristic species in this vegetation community in the study area include Brazilian peppertree (*Schinus terebinthifolius*) and acacia. Non-native vegetation occurs in the northwestern portion of the study area adjacent to beach access areas, east of the northern bridge abutment, and along the southern banks of the river/lagoon channel and beach areas south of the bridge.

Ornamental

This vegetation classification is comprised of non-native plant species, typically planted for landscaping schemes, and often irrigated. Ornamental vegetation is often associated with developed lands. Within the project study area, a relatively small area of ornamental vegetation was mapped northwest of the bridge at the trail entrance to the beach. This planted/landscaped area consists of a succulent garden comprised of a variety of non-native ornamental succulent plants such as agave species (*Agave* spp.), yucca species (*Yucca* spp.), and aloe species (*Aloe* spp.).

Southern Coastal Bluff Scrub

Southern coastal bluff scrub is a short scrub up to two meters tall, often forming continuous mats. It consists of dwarf shrubs, herbaceous perennials, and annuals with varying degrees of succulence. It is exposed to varying, moisture-laden winds with high salt content, and the soil is usually rocky and poorly developed. Characteristic species in this community include saltbush (*Atriplex* spp.), dudleyas (*Dudleya* spp.), California encelia (*Encelia californica*), coast prickly pear (*Opuntia littoralis*), and lemonadeberry (*Rhus integrifolia*). Within the study area, this vegetation community is dominated by big saltbush (*Atriplex lentiformis*). Southern coastal bluff scrub occurs in one area along the northwestern edge of the study area, northwest of the Camino del Mar bridge.

Southern Coastal Salt Marsh

Southern coastal salt marsh is a highly productive, herbaceous and suffrutescent, salt-tolerant vegetation community of hydrophytes, forming a moderate to dense cover up to one meter tall (Holland 1986). This vegetation occurs at the inland margins of bays, lagoons, and estuaries along the southern California coast. Characteristic species in this vegetation community include saltgrass, spiny rush (*Juncus acutus*), pickleweeds (*Salicornia* spp.), and fleshy jaumea. Southern coastal salt marsh occurs primarily in the northeastern portion of the study area and is dominated by Pacific pickleweed (*Salicornia pacifica*) and fleshy jaumea.

Southern Willow Scrub

Southern willow scrub consists of dense, broadleaved, winter-deciduous stands of trees dominated by shrubby willows (*Salix* sp.) in association with mule fat (*Baccharis salicifolia*), and with scattered emergent cottonwood (*Populus fremontii*) and western sycamores (*Platanus racemosa*). This vegetation community occurs on loose, sandy, or fine gravelly alluvium deposited near stream channels during flood flows. This vegetation type within the project study area is dominated by arroyo willow and occurs as a small stand along the toe of slope of Camino Del Mar, northeast of the bridge.

Plants

A total of ~~48~~ 52 plant species were observed in the study area during project surveys of which 20 (approximately 42 percent) are non-native species (Appendix A, *Plant Species Observed*).

Animals

A total of ~~40~~ 44 animal species were observed or detected within the study area during project surveys, including three invertebrate, one fish, and 36 bird species (Appendix B, *Animal Species Observed or Detected*).

Sensitive Biological Resources

Sensitive Vegetation Communities and Habitats

Sensitive vegetation communities and habitats are those considered rare within the local region or sensitive by CDFW; are listed as sensitive under a regional planning program (e.g., MSCP); or support sensitive plants or animals as defined by Section 15380 of the State CEQA Guidelines. They are considered sensitive because they have been depleted, are naturally uncommon, or support sensitive species. Within the project study area, nine sensitive vegetation communities and habitat types were identified: alkali marsh, beach, Diegan sage scrub (including disturbed), estuarine, intertidal area, mudflat, southern coastal bluff scrub, southern coastal marsh, and southern willow scrub. Developed land, disturbed habitat, ornamental, and non-native vegetation are not considered sensitive vegetation/ habitat under CEQA.

Sensitive Plants

Special status plant species have been afforded special status and/or recognition by the USFWS and/or CDFW. They may also be included in the CNPS' Inventory of Rare and Endangered Plants. Their status is often based on one or more of three distributional attributes: geographic range, habitat specificity, and/or population size.

Within the project study area, ~~three~~ four sensitive plant species were detected: red sand-verbena (*Abronia maritima*), southwestern spiny rush (*Juncus acutus* var. *leopoldii*), ~~and~~ Torrey pine (*Pinus torreyana* ssp. *torreyana*), and woolly seablite (*Suaeda taxifolia*). ~~Although found present in the study area, none of these three plant species were detected within the project site itself.~~ No federally or state listed endangered or threatened plant species were found to be present in the study area during project-specific surveys conducted in 2012, 2013, 2014, ~~and~~ 2018, and 2022. Additional information on

these four ~~three~~ special-status plant species is provided below, and their spatial distribution in the study area is presented on Figure 6, *Special-Status Plants and Animals*.

Red sand-verbena (*Abronia maritima*)
Status: CNPS CRPR 4.2
Distribution: Nearly extirpated in southern California, but may occur in Los Angeles, Orange, San Diego, San Luis Obispo, Ventura, Santa Barbara, and Santa Cruz counties; Baja California, Mexico
Habitat: Coastal dunes
Presence in the Project Study Area: Five red sand-verbena plants were detected in beach habitat east of the bridge, outside the project site footprint.

Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*)
Status: CNPS CRPR 4.2
Distribution: Los Angeles, San Bernardino, San Luis Obispo, Ventura, and San Diego counties; Baja California, Mexico
Habitat: Coastal bluffs and coastal scrub
Presence in the Project Study Area: Two individuals of southwestern spiny rush were found during biological surveys for the project, located within Diegan Coastal sage scrub in the study area, but outside of the project site footprint. ~~These plants were found.~~

Torrey pine (*Pinus torreyana* ssp. *torreyana*)
Status: CNPS Rare Plant Rank 1B.2
Distribution: Northern portions of San Diego County, along the coast.
Habitat(s): Coastal sage scrub and chaparral vegetation types (e.g., southern maritime and southern mixed chaparrals).
Presence in the Project Study Area: ~~A single Torrey pine was detected in the northern portion of the project study area, just outside and to the east of the project site footprint, within Diegan coastal sage scrub habitat.~~A total of 13 Torrey pine trees were found in the study area during surveys for the project; 1 tree located northeast of the bridge, 11 trees within the street center median landscaping (10 to the north and one to the south of the bridge), and 1 on the west side of Camino del Mar adjacent to the south end of the bridge.

Woolly sea-blite *(Suaeda taxifolia)*
Status: CNPS Rare Plant Rank 4.2
Distribution: Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego counties; Baja California, Mexico.
Habitat(s): Coastal bluff scrub, coastal dunes, and margins of coastal salt marshes.
Presence in the Project Study Area: One individual of this species was observed within the study area, located east of the bridge across/east of the San Dieguito River mouth.

Overall, special-status plant species were evaluated for the potential to occur in the project study area based on the vegetation communities/habitat types present, soils and geographic location, sightings reported to the CNDDB and/or CNPS databases, or documentation in nearby studies. Special-status plant species evaluated for the potential to occur at the project site are listed in Attachment C. Based on the species evaluations, and results of focused rare plants surveys for the project, no additional sensitive plants are expected to occur on-site.

Sensitive Animals

One special-status animal species was detected in the project study area during surveys for the project, Belding's savannah sparrow. No other sensitive animal species were found to be present on-site during project-specific surveys conducted in 2012, 2013, ~~and~~ 2018, and 2022. Other than Belding's savannah sparrow, no other special-status animal species have been detected during focused surveys for the project ~~in 2022, which are currently in progress~~. Additional information on this special-status animal species is provided below and presented on Figure 6.

Belding's savannah sparrow (*Passerculus sandwichensis beldingi*)
Status: State listed endangered (SE)
Distribution: In San Diego County, occurs throughout coastal lowlands
Habitat: Coastal marshes
Presence in the Project Site: Three territories of the Belding's savannah sparrow were found east of the bridge during the 2013 surveys. No individuals were observed during surveys in 2018. Focused surveys in 2022 found ~~two~~ three territories in the project study area, east of the bridge in habitat on the east side of the lagoon.

In addition to Belding's savannah sparrow, other special-status animal species that were evaluated for the potential to occur at the project site are listed in Appendix D. No other species were determined to have the potential to occur on-site, based on the habitat types present, geographic location, sightings reported to the CNDDB and/or USFWS databases, or documentation in nearby studies.

Although no special-status fish species are expected to occur in the study area, multiple common fish species may occur in the study area, including species managed by the NOAA NMFS Pacific Fishery Management Council. These fish species include northern anchovy (*Engraulis mordax*); California grunion (*Leuresthes tenuis*); and Pacific Coast groundfish species such as California halibut (*Paralichthys californicus*), California skate (*Raja inornate*), leopard shark (*Triakis semifasciata*), and speckled sanddab (*Citharichthys stigmaeus*).

Jurisdictional Resources

Approximately 12.83 acres of potentially jurisdictional waters of the U.S. were identified in the project study area, consisting of 1.71 acres of wetlands and 11.12 acres of non-wetland waters. Wetlands in the project study area are also considered special aquatic sites. Areas considered waters of the U.S. may be subject to USACE and RWQCB jurisdiction. These 12.83 acres as well as an additional 0.01-acre are also considered potentially jurisdictional habitats and coastal wetlands, under the jurisdiction of CDFW and California Coastal Commission, respectively. Specifically, these areas consist of 1.72 acres of wetlands/special aquatic sites and 11.12 acres of non-wetland waters. Potentially jurisdictional aquatic resources are presented below in Table 3*, Potentially Jurisdictional Aquatic Resources Summary,* and reflected on Figures 7a, *Waters of the United States*, 7b, *CDFW Jurisdiction*, and 7c, *California Coastal Commission Wetlands.* No isolated waters potentially subject to RWQCB jurisdiction were detected in the study area; thus, no areas of jurisdiction that are exclusively regulated by the RWQCB under the Porter-Cologne Water Quality Control Act are present.

Table 3
POTENTIALLY JURISDICTIONAL AQUATIC RESOURCES SUMMARY[1]

Vegetation Community or Habitat Type	USACE Waters of the U.S.[2]	CDFW Jurisdiction and Coastal Commission Wetlands
Special Aquatic Sites including Wetlands		
Alkali Marsh	0.12	0.12
Mudflat	0.26	0.26
Southern Coastal Salt Marsh	1.23	1.24
Southern Willow Scrub	0.10	0.10
Subtotal	*1.71*	*1.72*
Non-wetland Waters		
Beach	5.60	5.60
Estuarine	0.92	0.92
Intertidal (Open Water)	4.60	4.60
Subtotal	*11.12*	*11.12*
TOTAL	**12.83**	**12.84**

[1] Acreage rounded to the 0.01.
[2] Potentially subject to RWQCB jurisdiction.

The descriptions of jurisdictional resources and maps provided in the project's Aquatic Resources Delineation Report represent HELIX's recommendation based on the information available at the time of the delineation (HELIX 2021). The final determination on the extent of features subject to jurisdiction are subject to USACE, RWQCB, CDFW, and/or CCC regulation would be made by these agencies during regulatory permitting for the project.

Wildlife Corridors and Movement

Wildlife corridors connect otherwise isolated pieces of habitat and allow movement or dispersal of plants and animals. Wildlife corridors can be local or regional in scale. Their functions may vary temporally and spatially based on conditions and species presence. Corridors represent areas where wildlife movement is concentrated due to natural or anthropogenic constraints. Local corridors provide access to resources such as food, water, and shelter. Animals use these corridors in their daily routine to move between different habitats. Regional corridors also provide these functions and link two or more large habitat areas providing avenues for wildlife dispersal, migration, and contact between otherwise distinct populations.

The San Dieguito River lagoon outlets into the Pacific Ocean approximately 400 feet west of the bridge. The San Dieguito River and the associated lagoon area are mapped as a Biological Core Area (BCA) in the County's MSCP. BCAs are defined as areas generally supporting high concentrations of sensitive biological resources which, if lost or fragmented, could not be replaced or mitigated elsewhere (County 1998). The San Dieguito River and San Dieguito Lagoon provide regionally important feeding and resting areas for migratory birds along the Pacific Flyway, as well as tidal, open water, mudflat, and salt marsh habitats that support a variety of birds, fishes, and invertebrates. Eastward movement of terrestrial wildlife from the study area is constrained by the State Fairgrounds and developed areas around it. The river is highly constrained for the approximately 0.5-mile reach situated between Camino Del Mar, eastward past the railroad tracks to Jimmy Durante Boulevard. More extensive areas of native habitat occur east of Jimmy Durante Boulevard on both sides of I-5.

The San Dieguito Lagoon and San Dieguito River mouth are not ~~is~~ mapped as ~~Essential Fish Habitat (~~EFH~~) under~~ by the NOAA NMFS on-line mapper (NOAA NMFS 2021). According to data presented in the EFH online mapper and two fishery management plans (FMPs)~~,:~~ the Coastal Pelagic Species FMP and the Pacific Coast Groundfish FMP, EFH is located approximately 500 feet west of the project (Pacific Fishery Management Council 2021 and 2022~~2016a and 2016b~~, respectively). However, based on communication and coordination with NOAA NMFS in December 2022, the project area does contain EFH for groundfish and coastal pelagic species. As defined by the U.S. Congress in the 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act, EFH includes the waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. EFH for coastal pelagic species includes all marine and estuarine waters from the shoreline along the U.S. west coast offshore to the limits of the Exclusive Economic Zone (the 200-nautical mile limit) and down to specific depths depending upon the species and temperature regimes. The EFH for Pacific Coast groundfish extends to the high tide line, but no higher, along the entire West Coast of the U.S. (NOAA-NMFS ~~2016~~2021). The estuarine habitat within lagoon is not EFH, but is ~~also~~ designated as a Habitat Area of Particular Concern for EFH (NOAA NMFS 2021).

Within the project study area, some movement of wildlife, particularly marine birds, occur north and south of the river, on either side of the bridge among the mudflats, beach, and intertidal waters. Additionally, urban wildlife species such as raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), coyote (*Canis latrans*), and skunk (*Mephitis mephitis*) could also use upland areas alongside the river as well as travel along the existing pedestrian trail located to the south of the river. Other than these localized areas, the disturbed nature of the surroundings with its developed, urbanized environment likely deters wildlife from moving between areas of habitat associated with the river to other areas surrounding the project study area and immediately surrounding vicinity. Terrestrial wildlife movement in the study area is constrained by the State Fairgrounds and developed areas around it. The river is highly constrained for the approximately 0.5-mile reach situated between Camino del Mar, eastward past the railroad tracks to Jimmy Durante Boulevard. More extensive areas of native habitat occur east of Jimmy Durante Boulevard on both sides of I-5. In addition to terrestrial movement, the San Dieguito River mouth likely provides passage and habitat for common marine fish species, including topsmelt, northern anchovy, California grunion, and Pacific Coast groundfish species such as California halibut, California skate, leopard shark, and speckled sanddab, which have potential to occur within the study area.

Overall, while the study area and adjacent native habitats associated with the lagoon support localized use by wildlife, particularly birds and some common urban mammal species, it does not serve as a regional wildlife corridor or habitat linkage due to its relatively small size and constrained connectivity to larger habitat areas (i.e., narrow river connection with development abutting both edges of the open water).

REGIONAL AND REGULATORY CONTEXT

The following federal, state, and/or local regulations apply to biological resources on-site.

Federal

Federal Endangered Species Act

Administered by the USFWS, the federal ESA provides the legal framework for the listing and protection of species (and their habitats) that are identified as being endangered or threatened with extinction. Actions that jeopardize endangered or threatened species, and the habitats upon which they rely, are considered take under the ESA. Section 9(a) of the ESA defines take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." "Harm" and "harass" are further defined in federal regulations and case law to include actions that adversely impair or disrupt a listed species' behavioral patterns.

Sections 7 and 4(d) of the Federal ESA regulate actions that could jeopardize endangered or threatened species. Section 7, administered by the USFWS, describes a process of Federal interagency consultation for use when Federal actions may adversely affect listed species. A Section 7 Consultation (formal or informal) is required when there is a nexus between a listed species' use of a site and if the project is funded (wholly or in part) by the State Revolving Fund. A biological assessment is required for any major construction activity if it may affect a listed species. Take can be authorized via a letter of Biological Opinion, issued by the USFWS, for non-marine related listed species issues. The project would be funded in part by the State Resolving Fund. A Section 7 Consultation would be required if impacts to a federally listed species would occur.

Identified by the USFWS, critical habitat is defined as areas of land that are considered necessary for endangered or threatened species to recover. The ultimate goal is to restore healthy populations of listed species within their native habitat, so they can be removed from the list of threatened or endangered species. Once an area is designated as critical habitat pursuant to the federal ESA, all federal agencies must consult with the USFWS to ensure that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of the critical habitat.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) was originally enacted in 1976 to manage and control foreign fisheries within 200 miles off the U.S. Since initial legislation, the MSFCMA has been amended to focus long-term conservation and sustainability of marine fisheries. Target objectives by the MSFCMA include: preventing overfishing, rebuilding fish stocks, ensuring safe seafood supply, and protecting fish habitats. The MSFCMA identifies and describes EFH as well as designate Habitat Areas of Particular Concern. The NOAA NMFS is the federal agency overseeing implementation of the MSFCMA.

Migratory Bird Treaty Act

All migratory bird species native to the United States and its territories are protected under the Migratory Bird Treaty Act (MBTA), as amended under the Migratory Bird Treaty Reform Act (MBTRA) of 2004 (FR Doc. 05-5127; USFWS 2004). The MBTA mandates protection for eggs and chicks of all

migratory bird species but does not stipulate specific protection measures. In common practice, the MBTA is used to place restrictions on the disturbance of active bird nests during the nesting season (generally February 15 to August 31). In addition, the USFWS commonly places restrictions on disturbances allowed near active raptor nests.

Clean Water Act and Rivers and Harbors Act

Federal wetland regulation (non-marine issues) is guided by the Rivers and Harbors Act of 1899 and the CWA. The Rivers and Harbors Act deals primarily with discharges into navigable waters, while the purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of all waters of the U.S. Permitting for projects filling waters of the U.S. is overseen by the USACE under Section 404 of the CWA. Most development projects are permitted using Individual Permit or Nationwide Permit instruments.

Coastal Zone Management Act of 1972

The Coastal Zone Management Act (CZMA) creates a broad program for the management of coastal lands based on land development control. It was enacted to encourage the participation and cooperation of state, local, regional, federal agencies, and governments to have programs affecting the coastal zone. The CZMA allows state involvement through the development of Coastal Zone Management Plans (CZMP) for comprehensive management at the state level. The CZMPs define permissible land and water use within the state coastal zone. This coastal zone extends three miles seaward and inland as far as necessary to protect the coast. The CZMA also requires federal agencies or licensees to carry out their activities in such a way that they conform to the maximum extent practicable with a state's coastal zone management program. The California Coastal Act is California's coastal zone management program under the CZMA. This program is discussed below.

State of California

California Environmental Quality Act

Primary environmental legislation in California is found in CEQA and its implementing guidelines (State CEQA Guidelines), requiring that projects with potential adverse effects or impacts to the environment undergo environmental review. Adverse impacts to the environment are typically mitigated as a result of the environmental review process in accordance with existing laws and regulations.

California Endangered Species Act

The CESA established it is state policy to conserve, protect, restore, and enhance state endangered species and their habitats. Under state law, plant and animal species may be formally designated rare, threatened, or endangered by official listing by the California Fish and Game Commission. The CESA authorizes that private entities may “take” plant or wildlife species listed as endangered or threatened under the FESA and CESA, pursuant to a federal Incidental Take Permit if the CDFW certifies that the incidental take is consistent with CESA (CFG Code Section 2080.1[a]). For state-only listed species, Section 2081 of the CFG Code authorizes the CDFW to issue an Incidental Take Permit for state-listed threatened and endangered species if specific criteria are met. The MSCP is a regional Natural Communities Conservation Plan that was granted take coverage under Section 2081 of the CESA.

California Fish and Game Code

Pursuant to California Fish and Game Code Section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Raptors and owls and their active nests are protected by California Fish and Game Code Section 3503.5, which states that it is unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird unless authorized by the CDFW.

California Coastal Act of 1976

The California Coastal Act (CCA) provides for the protection of environmentally sensitive habitat identified by the CDFW from adjacent developments in the coastal zone. The CCA is California's coastal zone management program under the CZMA, discussed above. The CCA establishes the CCC as having jurisdiction over California's coastal zone. The CCA identifies environmentally sensitive habitat areas as any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments. Compliance with requirements in the CCA is ensured for specific development projects in the coastal zone through the issuance of a Coastal Development Permit (CDP). In most incorporated areas within the coastal zone, compliance with the CCA is regulated by local government through the implementation of a certified LCP. The local government typically issues CDPs and implements their approved LCP in regulating developments within the coastal zone. Portions of the project are within areas under the jurisdiction of the City's certified LCP and the CCC permit authority area.

Natural Communities Conservation Planning Act

The Natural Communities Conservation Planning (NCCP) program is a cooperative effort to protect habitats and species. It began under the State's NCCP Act of 1991, legislation broader in its orientation and objectives than the CESA or FESA. These laws are designed to identify and protect individual species that have already declined significantly in number. The NCCP Act of 1991 and the associated Southern California Coastal Sage Scrub NCCP Process Guidelines (1993), Southern California Coastal Sage Scrub NCCP Conservation Guidelines (1993), and NCCP General Process Guidelines (1998) have been superseded by the NCCP Act of 2003. The MHCP is an enrolled NCCP program and was adopted in 2003 by the County.

Local

County of San Diego Multiple Species Conservation Program

The California NCCP Act of 1991 (Section 2835) allows the CDFW to authorize take of species covered by plans in agreement with NCCP guidelines. A Natural Communities Conservation Program, initiated by the State of California, focuses on conserving coastal sage scrub, and in concert with the USFWS and the federal ESA, is intended to avoid the need for future federal and state listing of coastal sage scrub-dependent species.

The MSCP Plan was approved in August 1998 covers 85 species and includes a 900-square mile area in southwestern San Diego County (County 1998). The Draft City of Del Mar Subarea, portions of the unincorporated County, and 10 additional city jurisdictions comprise the MSCP Plan area. It is a

comprehensive, long-term habitat conservation plan that addresses the needs of multiple species by identifying key areas for preservation as open space in order to link core biological areas into a regional wildlife preserve. The MSCP is one of several large multiple jurisdictional habitat planning efforts in San Diego County, each of which constitutes a subregional plan under the NCCP Act of 1991. The MSCP includes incorporated cities in southwestern San Diego County that will implement their respective portions of the MSCP through citywide "subarea" plans, which describe the specific implementing mechanisms each city will institute for the MSCP. The City of Del Mar has not approved or adopted its Draft Subarea Plan; therefore, the project is not subject to the provisions of the MSCP, although it is referenced for project planning considerations and demonstration of voluntary consistency.

City of Del Mar General Plan

The Environmental Management Element of the City's Community Plan (General Plan) provides goals and policies applicable to the project site as they relate to the conservation of natural resources as well as the protection and preservation of sensitive species and their habitats (City 2019).

Del Mar Municipal Code

The Del Mar Municipal Code includes a Lagoon Overlay Zone to protect wetland resources of the San Dieguito Lagoon, including sensitive upland habitats. The proposed project is within the Lagoon Overlay Zone, which is codified and described in Chapter 30.53.10 of the Del Mar Municipal Code. All development activities in the Lagoon Overlay Zone are to be designed and implemented in a manner consistent with the required wetland protection, wetland enhancement, and permitted uses specified under Sections 30.53.040 through 30.53.170 of the City's Municipal Code. Additionally, development in the Lagoon Overlay Zone requires the approval of both a Conditional Use Permit (CUP) and CDP by the City. Permitted uses in wetlands are limited to aquaculture, scientific research, and wetland restoration projects. Section 30.52.080 prohibits activities that would involve "grading, filling, construction, or placement of structures within the boundaries of wetlands as determined pursuant to the provisions of this Chapter."

PROJECT IMPACTS/EFFECTS, SIGNIFICANCE, AND PROPOSED MITIGATION

For the purpose of evaluating potential project effects (i.e., impacts) and as prescribed by the Issues in CEQA Appendix G Section IV Biological Resources, the proposed project would result in a significant impact if it would:

1. Have a substantial adverse effect, either directly or through habitat modifications, on any candidate, sensitive, or special status species in local or regional plans, policies, or regulations or by the USFWS or CDFW;

2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by USFWS or CDFW;

3. Have a substantial adverse effect on federally protected wetlands as defined by Clean Water Act Section 404 (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

4. Interfere substantially with the movement of any native resident, migratory fish, or wildlife species, or established native resident or migratory wildlife corridors; or impede use of native wildlife nursery sites;

5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state conservation plan.

The significance of impacts to biological resources present or those with the potential to occur was determined based upon the sensitivity of the resource and the extent of the anticipated impacts. For certain highly sensitive resources (e.g., a federally listed species), impacts would be significant. Conversely, other resources that are of low sensitivity (e.g., species with a large, locally stable population in the County but declining elsewhere) could sustain some impact with a less than significant effect. Analyses of project impacts to biological resources are discussed in detail below.

IMPACTS

This section describes potential direct and indirect effects (impacts) on biological resources associated with the proposed project. Direct impacts are immediate impacts and typically result in permanent removal. Direct impacts for the project were quantified by overlaying the limits of project-related ground disturbance on the biological resources map of the site (Figure 8, *Project Impacts*). Indirect impacts are actions by the project that are not direct removal of resources but affect the surrounding resources either as a secondary effect of the direct impacts (e.g., construction noise, runoff, nighttime lighting, fugitive dust, etc.) or as the cause of degradation of a biological resource over time (e.g., edge/adjacency effects). The magnitude of an indirect impact can be the same as a direct impact; however, the effect usually takes longer to become apparent.

Issue 1 – Sensitive Species

Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?

Issue 1 Analysis of Project Effects

Sensitive Plants

Less than Significant Impact.

Two of the 13 Torrey pine trees located within the study area would be removed during project construction: one located on the west side of the roadway adjacent to the south end of the bridge and one within the Camino del Mar roadway median south of the bridge. These two trees are located within a public right-of-way and are isolated to a small area of the construction zone. Section 23.50.080 C.10 of the Del Mar Municipal Code allows the removal of a protected tree if the tree obstructs proposed improvements that cannot be reasonably designed to avoid the need for tree removal. In context of the proposed project, tree removal is required in order to accommodate the necessary improvements

required for the bridge removal and replacement with a structure that meets applicable public health and safety standards and protection from hazards (i.e., earthquakes, flooding, and sea level rise), while remaining within the existing bridge right-of-way, and not resulting in new off-site impacts. The removal of the two Torrey pine trees within the Camino del Mar public road right-of-way would be addressed through the City's Public Tree/Landscape Management program, as administered by the City of Del Mar Public Works Department. Existing credits that have been added to the Program via Capital Improvement Program projects would be applied to the project to ensure compliance with Chapter 23.50 of the Del Mar Municipal Code.

With the exception of these two Torrey pine trees that would be removed and replaced through the City's Public Tree/Landscape Management program, none of the other special-status plants were found to occur in areas where project impacts are proposed, and none are expected to occur. ~~The project would have no impact on federal or State-listed plant species. Three sensitive plant species were detected within the project study area but located outside of the project impact footprint; thus, no impacts to these species are expected. Based on the results of focused plant surveys for the project, no additional sensitive plant species were detected or are expected to occur.~~ Thus, project impacts to sensitive plants ~~are not anticipated~~would be less than significant.

Sensitive Animals

Less than Significant Impact with Mitigation Incorporated. Implementation of the project is not anticipated to result in direct impacts to the State listed endangered Belding's savannah sparrow or its habitat/territory, as suitable nesting and foraging habitat for this species does not occur within the impact area. No other direct impacts to sensitive animal species are expected as a result of the project. Indirect impacts to Belding's savannah sparrow may occur if the species is present within suitable habitat adjacent to project construction activities. Specifically, construction-related noise could cause breeding birds to temporarily or permanently leave their territories to avoid disturbances from human activities, which could lead to reduced reproductive success and increased mortality. Noise effects would be considered potentially significant if noise levels generated during construction exceed a level of 60 A-weighted decibels (dBA) hourly average (L_{EQ}) or ambient (whichever is greater) adjacent to sensitive nesting bird species such as Belding's savannah sparrow. During construction, up to 12 temporary night closures of the bridge during the 27-month construction period are expected during which lighting would be needed. Night lighting that extends onto adjacent wildlife habitat can discourage use of the habitat by nocturnal wildlife and can also provide nocturnal predators with an unnatural advantage over their prey, resulting in a potentially significant impact. Temporary lighting would be required to be oriented downward (toward the bridge deck), and the lighting source would be required to be shielded in order to minimize light spill and avoid adverse effects on adjacent wildlife habitat. With the implementation of mitigation measures **BIO-1** and **BIO-2** potential indirect impacts to Belding's savannah sparrow would be avoided or reduced to below a level of significance.

Given the location of the project within the San Dieguito River, there are a variety of birds that migrate seasonally through the project area on the Pacific flyway, as well as certain birds that permanently reside locally. Pursuant to the Migratory Bird Treaty Act (MBTA), the development of the proposed project could disturb or destroy active migratory bird nests if vegetation clearing occurs during the general bird nesting season (February 15 through September 30) and/or raptor nesting season (January 15 through July 31). Disturbance to or destruction of migratory bird nests are in violation of the MBTA and are, therefore, considered to be a potentially significant impact. Implementation of mitigation

measure **BIO-3** would ensure that potential impacts to birds protected under the MBTA and California Fish and Game Code are avoided during construction.

As noted above, no special-status fish species are expected to occur in the study area; however, project construction would include specific operating procedures and implementation of BMPs to protect water quality in the study area, which ultimately correlates to protecting fish with potential to occur within the study area, including those managed by NOAA NMFS Pacific Fishery Management Council. The study area is not identified as supporting EFH; thus, no impacts to EFH are anticipated. Construction operating procedures and BMPs implemented for the project would also ensure that EFH located outside of the study area would not be adversely affected by the project. Details of these construction procedures and BMPs are presented in the Project Description.

Issue 1 Mitigation Measures

BIO-1 **Pre-construction Protocol Surveys and Listed Species Avoidance.** In preparation for construction and to confirm presence or absence of Belding's savannah sparrow, a pre-construction survey shall be conducted one year prior to construction, ~~If construction activities are scheduled to start~~ during the breeding season ~~for Belding's savannah sparrow~~ (~~February~~ March 15 to June 30)~~, a qualified biologist shall conduct pre-construction surveys to determine the presence or absence of this species. The final survey shall not be completed more than three days prior to the beginning of construction or grading activities. If it is determined at the completion of pre-construction surveys that active nests belonging to this species are absent within 300 feet of construction, construction shall be allowed to proceed~~. If Belding's savannah sparrow is detected within the project impact footprint ~~during pre-construction surveys~~, the City shall notify CDFW, and if required by CDFW, shall prepare and submit an application for a Section 2081(b) Incidental Take Permit for impacts to Belding's savannah sparrow prior to construction. If it is determined by the survey that active territories for Belding's savannah sparrow are absent within 300 feet of construction, construction shall be allowed to proceed.

If results of the pre-construction survey discussed above conclude Belding's savannah sparrow is absent, a subsequent survey shall be conducted prior to work if construction is scheduled to commence between March 15 and June 30 (i.e., breeding season for Belding's savannah sparrow) to ensure absence of this species. ~~If pre-construction surveys determine the presence of~~ If this subsequent survey finds active nesting territories belonging to this species within 300 feet of construction, then construction shall: (1) be postponed until a qualified biologist determines the nest(s) is no longer active or until after the respective breeding season; ~~or~~ (2) not occur until a temporary noise barrier or berm is constructed at the edge of the development footprint and/or around construction equipment to the satisfaction of the project biologist; and/or (3) shall be postponed until consultation with CDFW to address protection of this species has been completed by the City~~to ensure that noise levels are reduced to below 60 A-weighted decibels (dBA) or ambient. Decibel output shall be confirmed by a qualified noise specialist, and intermittent monitoring by a qualified biologist shall be required to ensure that conditions have not changed~~.

BIO-2 **Construction Noise Abatement.** If noise-generating construction activities are not completed prior to the breeding season for Belding's savannah sparrow (~~February~~ March 15 through June 30) and this species is found present during the pre-construction surveys completed in accordance with **BIO-1**, then appropriate noise attenuation measures shall be implemented to

reduce construction noise levels at the edge of occupied habitat ~~to below 60 dBA L_{EQ} (one hour average)~~. Noise levels shall be recorded by a qualified noise specialist and intermittent monitoring shall be conducted by a qualified biologist. ~~Such~~Noise attenuation measures shall include, but not be limited to, the following:

- Construction equipment shall be properly outfitted and maintained with manufacturer-recommended noise-reduction devices.
- Diesel equipment shall be operated with closed engine doors and equipped with factory-recommended mufflers.
- Mobile or fixed "package" equipment (e.g., arc-welders and air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
- Electrically powered equipment shall be used instead of pneumatic or internal- combustion powered equipment, where feasible.
- Unnecessary idling of internal combustion engines (e.g., in excess of five minutes) shall be prohibited.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.
- No project-related public address or music system shall be audible at any adjacent sensitive receptor.
- Temporary sound barriers or sound blankets shall be installed between construction operations and adjacent noise-sensitive habitat. ~~The project Contractor shall construct a temporary noise barrier at least six feet in height meeting the specifications listed below (or of a Sound Transmission Class 19 rating or better) to attenuate noise.~~
- ~~All barriers shall be solid and constructed of wood, plastic, fiberglass, steel, masonry, or a combination of those materials, with no cracks or gaps through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove or close butted seams and must be at least 3⁄4-inch thick or have a surface density of at least 3.5 pounds per-square-foot. Sheet metal of 18-gauge (minimum) may be used if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Noise blankets, hoods, or covers also may be used, provided they are appropriately implemented to provide the required sound attenuation.~~

BIO-3 **Nesting Bird and Raptor Avoidance**. In order to avoid violation of the federal MBTA and California Fish and Game Code, site-preparation activities (removal of trees and vegetation) shall be avoided during the general avian breeding/nesting season (January 15 to July 30 for raptors; February 15 to September 30 for other avian species), if practicable.

If site-preparation activities are to occur during the general avian or raptor breeding season, a pre-construction nesting survey shall be conducted within ~~30~~ three days prior to the commencement of construction. A qualified biologist shall perform the nesting survey to

ascertain whether there are active raptor nests or sensitive avian species nesting within 500 feet of the project footprint as well as other bird nests within 300 feet of the project footprint. This survey shall identify the species of nesting bird and to the degree feasible, nesting stage (e.g., incubation of eggs, feeding of young, near fledging). Nests shall be mapped (not by using GPS because close encroachment may cause nest abandonment). If the surveys conclude no active nesting, the work shall resume as planned. If project activities are delayed or suspended for more than five days during the breeding season, surveys shall be repeated prior to re-initiating work. If an active nest is observed, the nest location shall be fenced off surrounding an adequate radius buffer zone as determined by the biological monitor. Buffer distances may include, but shall not be restricted to, 100 feet around non-listed active passerine (e.g., perching birds and songbirds) nests and 300 feet around listed passerine (e.g., Belding's savannah sparrow) nests. The buffers may be reduced, if appropriate, and as directed by a qualified biologist. The reduction in no-work buffers shall be approved by the City prior to implementation. Each~~This~~ nest avoidance buffer zone shall not be disturbed until a qualified biologist has verified that the young have fledged, or the nest has otherwise become inactive.

Issue 2 – Sensitive Natural Communities

Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS?

Issue 2 Analysis of Project Effects

Less Than Significant with Mitigation Incorporated. No impacts to riparian habitat would occur as a result of the project; however, direct impacts (permanent and temporary) to other sensitive natural communities/habitats would occur, including beach, Diegan coastal sage scrub (including disturbed), intertidal (open water), and mudflat. Impacts to non-sensitive vegetation communities are not considered significant and, therefore, do not require mitigation.

Permanent impacts by the project consist of direct effects which alter the pre-construction condition permanently, whereas temporary impacts reflect areas of the project that would be directly impacted but replaced to a pre-construction condition following construction. Permanent impacts by the proposed project would occur from replacement of the existing bridge. Temporary impacts would primarily occur within the existing roadway segments north and south of the bridge, as well as the placement of temporary trestle structures on the east and west sides of the bridge to accommodate ongoing moving traffic during construction. Additionally, construction access and staging areas are considered temporary impacts as they also reflect areas that would be impacted but replaced to a pre-construction condition following construction. Table 4, *Project Impacts to Sensitive Natural Communities*, provides the quantities of proposed project impacts, and Figure 8, *Project Impacts*, presents the spatial distribution of project impacts and impact footprint.

Table 4
PROJECT IMPACTS TO SENSITIVE NATURAL COMMUNITIES[1]

Vegetation Community or Habitat Type	Temporary Impacts	Permanent Impacts	Total Impacts
Beach	0.88	0.36	1.24
Diegan Coastal Sage Scrub (including disturbed)	0.02	0.16	0.18
Intertidal (Open water)	0.41	0.04	0.45
Mudflat	0.00	<0.01	<0.01
TOTAL	**1.31**	**0.56**	**1.87**

[1] Acreage rounded to the nearest 0.01.

While the project has been designed to minimize impacts to sensitive natural communities/habitats to the greatest extent practicable, direct impacts could not be completely avoided due to the location of the bridge structures in relation to existing natural resources.

Direct impacts to intertidal open water, mudflat, and beach habitats would occur during the removal of the existing bridge pilings and the replacement of new piers. However, project effects would be offset by the implementation of the project itself. ~~t~~The removal of the existing pilling structures, which are greater in quantity and diameter than the piers proposed for the replacement bridge, would result in a net environmental benefit due to the expected uplift and improvement of tidal circulation and related functions. This reduction in the bridge structure from 0.05 acre currently (approximately 2,350 square feet [sf]) to 0.006 acre (approximately 257 sf) proposed by the project would ultimately reduce the obstruction within the open water compared to existing conditions.~~Additionally,~~ T~~t~~he ebb and flow of tidal current under the bridge would be enhanced due to the fewer number and smaller size of piers being installed for the replacement bridge, which would result in more natural tidal flows compared to that which currently exists. In addition, the construction activities within the intertidal open water habitat are temporally and spatially a minor undertaking and would not entail a long-term construction phase. Tidal flow beneath the bridge would be maintained during construction. Ultimately, such direct impacts to intertidal open water are considered less than significant and no mitigation is proposed. Additionally, direct impacts to less than 0.01-acre of mudflat (approximately 40 square feet) adjacent/below the bridge are considered less than significant. -Because the beach habitat is primarily unvegetated, the proposed direct impacts would result in relatively minor surface disturbance, and impacted areas of the beach would be rehabilitated and recontoured to restore it to natural sand grade and pre-construction conditions, impacts are considered less than significant. The current pier structures on site impede and spread natural tidal flows, likely expanding the area of inundated beach. Proposed reduction of structures within the intertidal area beneath the bridge would allow for better tidal flow/current, with less blockage/displacement, which may result in an increase of exposed beach. Overall, as discussed above in this section, the project is expected to result in a long-tern net environmental/ecological benefit to the San Dieguito Lagoon and River mouth and its associated habitats; thus, no mitigation to beach is proposed.~~No mitigation to beach is proposed.~~

Direct impacts (permanent and temporary) to relatively narrow strips/patches of Diegan coastal sage scrub located alongside Camino del Mar, north of the bridge, would occur as a result of the project. Permanent impacts to Diegan coastal sage scrub would be considered significant and would require mitigation. A 2:1 mitigation ratio is proposed for permanent impacts to Diegan coastal sage scrub. Mitigation would occur through on-site or off-site restoration, enhancement, and/or establishment/re-establishment with a minimum 1:1 establishment/re-establishment component (due to Coastal Zone requirements and to ensure no-net-loss), or the purchase of credits at an approved mitigation bank.

Mitigation within the Coastal Zone is preferred; mitigation located outside of the Coastal Zone shall require approval by the City and CCC, as well as other applicable agencies such as the CDFW.

Temporary impacts to Diegan coastal sage scrub would be replaced/restored to previous (pre-construction) condition or better (biologically equivalent or superior in function). By restoring this habitat to pre-construction condition or better, the temporary impacts would be considered less than significant; thus, no mitigation is proposed. If restoration to pre-construction condition or better is not completed, the impacts by the project would be considered significant. To ensure replacement of temporary impact areas, a habitat restoration plan would be required for the project to address/replace temporary impacts to Diegan coastal sage scrub.

Potential indirect impacts to natural communities as a result of the project are not expected. ~~Appropriate~~ Construction operating procedures/commitments and typical construction ~~Best Management Practices~~BMPs would be ~~selected and~~ installed for the project per compliance with National Pollutant Discharge Elimination System and Storm Water Quality Management Plan requirements prior to the onset of construction activities and throughout construction to reduce potential water quality impacts. These may include, but not limited to: (1) installing erosion and sediment control devices such as silt fences, fiber rolls, bonded fiber matrix, and gravel bags in appropriate locations; (2) placing temporary filters at storm drain inlets (e.g., gravel bags/filter fabric); (3) designating containment areas for material storage (e.g., covering/berming of soil stockpiles); and (4) providing containment areas for solid waste storage and concrete washout.

Mitigation for permanent impacts to 0.16 acre of Diegan coastal sage scrub may occur on- or off-site using habitat mapped as disturbed, non-native vegetation, and/or ornamental. A total of 0.37 acre of these habitat types was identified in the study area and could be available for potential Diegan coastal sage scrub establishment/re-establishment, which would meet the 1:1 establishment/re-establishment requirement. Potential Diegan coastal scrub enhancement is also available, totaling approximately 0.75 acre. This is greater than the 0.32-acre mitigation required. Ultimately, implementation of mitigation measure **BIO-4** would ensure that impacts to sensitive natural communities would be reduced to less than significant.

Issue 2 Mitigation Measures

BIO-4 **Habitat Restoration Plan.** The City shall prepare and implement of a habitat restoration plan. Temporary impacts to 0.02 acre of Diegan coastal sage scrub shall be restored to a pre-construction or superior condition at a 1:1 replacement within the area impacted. Permanent impacts to 0.16 acre of Diegan coastal sage scrub shall be mitigated at a 2:1 ratio. Mitigation shall occur through on- or off-site restoration, enhancement, and/or establishment with a minimum 1:1 establishment component, or the purchase of credits at an approved mitigation bank. Mitigation may occur on-site or off-site by converting habitat that has been mapped as disturbed, non-native vegetation, and/or ornamental into native habitat. The habitat restoration plan shall be submitted to CDFW for review and concurrence prior to ground disturbance that may impact Diegan coastal sage scrub. Mitigation located outside of the Coastal Zone shall require approval by the City and CCC, as well as other applicable agencies such as the CDFW.

Issue 3 – Wetlands

Would the project have a substantial adverse effect on federally-protected wetlands as defined by Section 404 of the federal Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Issue 3 Analysis of Project Effects

Less Than Significant with Mitigation Incorporated. The project would result in impacts to wetlands defined by Section 404 of the CWA. Approximately 2.21 acres of direct impacts to intertidal open water, mudflat, and adjacent beach would occur as a result of the project. These direct impacts consist of approximately 1.88~~90~~ acres of temporary impacts and approximately 0.33~~1~~-acre permanent impacts during the removal of existing bridge components and replacement with a new bridge (Table 4, *Project Impacts to Potentially Jurisdictional Aquatic Resources*). Although permanent impacts would occur, ultimately the project would result in smaller footprint within the jurisdictional area through the removal of the existing bridge piers and replacement with fewer piers. As a result, there would be a net gain in open intertidal water upon completion of the project and enhanced aquatic functions (e.g., improved tidal/flood processes, increased water column, expansion of benthic habitat, etc.).

Direct temporary impacts would primarily be for construction access and would be restored to pre-project conditions; permanent impacts would be negligible to these unvegetated habitats. The localized nature of the activities means that the temporal and spatial impacts to the surrounding environment from the replacement of the pilings are negligible. In addition, as stated above, the removal of the larger diameter existing pilings and replacement with structures with lesser girth is expected to improve tidal circulation and create a better tidal circulation; therefore, offsetting temporary impacts. The beach environment is unvegetated and impacts from project activities are expected to be surficial. As stated earlier, the current pier structures impede and spread natural tidal flows, likely expanding the area of inundated beach. Proposed reduction of structures within the intertidal area beneath the bridge would allow for better tidal flow/current, with less blockage/displacement, which may result in an increase of exposed beach. Additionally, ~~R~~replacement of the beach environment to pre-project condition by stabilizing it and contouring as a part of the project design is expected to offset temporary impacts. Overall, because the project would result in a smaller development footprint and provides increased function and value, project impacts are considered less than significant.

Although the project was designed and sited to avoid and minimize impacts to jurisdictional resources to the extent practicable, the project would impact potentially protected wetlands and waters under Section 404 of the CWA subject to the jurisdiction of the USACE. The project would also result in impacts to potentially jurisdictional waters of the state subject to jurisdiction by the RWQCB under Section 401 of the CWA and protected streambed and associated riparian habitat under the jurisdiction of the CDFW per Section 1602 of the CFGC. Lastly, project construction would result in impacts to wetlands subject to the permit authority of the CCC. Table 5, *Project Impacts to Potential Jurisdictional Areas*, depicts the potential impacts to jurisdictional waters under the purview of the USACE, RWQCB, CDFW, and CCC.

Table 5
PROJECT IMPACTS TO POTENTIALLY JURISDICTIONAL AQUATIC RESOURCES[1]

Vegetation Community or Habitat Type	USACE / RWQCB / CDFW / CCC Jurisdiction		
	Temporary Impacts	Permanent Impacts	Total Impacts
Beach	1.28	0.29	1.57
Intertidal (Open Water)	0.60	0.0~~45~~	0.6~~45~~
Mudflat	0.00	<0.01	<0.01
TOTAL	**~~1.90~~1.88**	**0.3~~31~~**	**2.21**

[1] Acreage rounded to the nearest 0.01.

Impacts to areas regulated under the CWA could require regulatory permitting by the USACE under Section 404 of the CWA and are expected to be authorized by the USACE under Nationwide Permit 14 (Linear Transportation Projects). In addition to a USACE Nationwide Permit, the RWQCB may also require a Water Quality Certification be required pursuant to Section 401 of the CWA. Impacts areas under the jurisdictional authority of the RWQCB would be the same as that of the USACE. Additionally, such impacts to intertidal open water, mudflat, and adjacent beach would be under the jurisdictional authority of CDFW pursuant to the CFGC, and CDFW could require a Streambed Alteration Agreement. Furthermore, these project impacts would also include CCC jurisdictional areas, and CCC would require the issuance of a coastal development permit (CDP) from the CCC and/or the City. Coordination between the City and CCC has occurred during regularly scheduled interagency meetings; topics of discussion for this project have included conducting pre-construction exploratory borings at future abutment locations and review of bridge design scenarios accounting for projected flooding and sea level rise.

Final requirements for regulatory permits for impact to open water and jurisdictional beach habitat would be determined in consultation with the resource agencies (i.e., USACE, RWQCB, CDFW, and CCC). In addition to permits, the resource agencies may require mitigation for project impacts. Implementation mitigation measure **BIO-5** would verify whether regulatory permits and/or mitigation would be required by the resource agencies and ensure that potential temporary and permanent impacts to jurisdictional aquatic resources would be less than significant.

Issue 3 Mitigation Measures

BIO-5 **Regulatory Permits.** Prior to project impacts to potentially jurisdictional resources, demonstration that regulatory permits from USACE, RWQCB, CDFW, and CCC, have been issued or that no such permits are required shall be provided to the City. Implementation of permit requirements, including additional mitigation, shall be required.

Issue 4 – Wildlife Movement and Nursery Sites

Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Issue 4 Analysis of Project Effects

Less Than Significant with Mitigation Incorporated. While the project site and immediately adjacent native habitats associated with the lagoon support localized use by wildlife, particularly birds, the project site does not function as a wildlife corridor/habitat linkage for non-avian terrestrial wildlife due to its relatively small size and constrained connectivity to larger habitat areas (i.e., narrow river connection with development abutting both edges of the open water).

Relative to potential interference with the movement of native resident or migratory fish, construction of the replacement bridge would temporarily disturb benthic and aquatic habitats within the lagoon. Although no special-status fish species are expected to occur in the study area, multiple common fish species managed by the NOAA NMFS Pacific Fishery Management Council may occur in the study area, including northern anchovy; California grunion; and Pacific Coast groundfish species such as California halibut, California skate, leopard shark, and speckled sanddab. Construction impacts would occur to primarily unvegetated soft-bottom habitat, which typically recovers faster than benthic environments which are more sensitive. Although impacts would occur as a result of bridge replacement, the project ultimately provides a net increase of subtidal habitat via the reduction of pilings/piers from ~~twelve~~ 12 associated with the existing bridge to ~~four~~ 4 proposed for the new bridge. Construction would result in temporary and short-term impacts to tidal areas beneath and adjacent to the bridge; however, substantial impacts to tidal flow are not anticipated and tidal circulation and related functions under the bridge would be enhanced. Overall, the project is expected to result in a long-term net environmental/ecological benefit to the San Dieguito Lagoon River mouth and its associated habitats. In order to further reduce potential temporary effects to aquatic and benthic habitats and passage of fish species through the project site, construction operating procedures and appropriate BMPs would be employed to address indirect effects related to water quality and hydroacoustic and vibration effects. Additionally, construction personnel would consult the Caltrans Construction Best Management Practices Manual (Caltrans 2017) to determine the appropriate BMPs for application in a tidal environment.

Although substantial impacts would not occur, the presence of subtidal and intertidal marine vegetation within the lagoon provides habitat for fish species and fish movement, including the species noted above. To evaluate potential impacts to fish movement and habitat, waters within 150 feet of the bridge were surveyed by Merkel & Associates in September 2018 for the presence of eelgrass (*Zostera marina*). Eelgrass within the survey area consisted of narrow marginal eelgrass beds extending along the shoreline between the deeper water areas and the beach and revetted shoreline northwest and southwest of the bridge (Merkel & Associates 2018). Eelgrass identified during the surveys was located in areas that would be avoided and protected in place during construction; thus, avoiding potential impacts to fish or other aquatic species. Because eelgrass is a dynamic habitat type that is continuously changing in density, biomass, and distribution and has the potential to occur within the project footprint at the time of construction preconstruction eelgrass surveys would be conducted, and applicable mitigation per the Southern California Eelgrass Mitigation Policy would be implemented should the project impact eelgrass ~~be impacted by the project~~. With the implementation of mitigation measure BIO-6, the project would not interfere with wildlife movement or impede the use of nursery sites and impacts would be less than significant.

Issue 4 Mitigation Measures

BIO-6 **Eelgrass Avoidance and Mitigation.** A pre-construction eelgrass survey shall be conducted in accordance with NOAA Fisheries California Eelgrass Mitigation Policy and Implementation Guidelines. If the pre-construction survey demonstrates eelgrass presence within the 100 feet of the construction footprint, then a mitigation plan to achieve no net loss in eelgrass function shall be developed and conducted in accordance with the California Eelgrass Mitigation Policy and Implementation Guidelines. The mitigation plan shall be reviewed and approved in consultation with NOAA Fisheries prior to project impacts to eelgrass. Mitigation options shall include (1) development of comprehensive management plans that protect eelgrass resources within the context of broader ecosystem needs and management objectives; (2) in-kind compensatory mitigation (e.g., creation, restoration, or enhancement of the same habitat type to mitigate for adverse impacts) that achieves a minimum final mitigation ratio of 1.38:1 once mitigation is complete (3) credits purchased through a mitigation bank or in-lieu fee program at a 1:1 ratio where the credits have been established for a full three-year period prior to use (or higher ratio should the bank credits have been in place for a period less than three years); (4) out-of-kind compensatory mitigation (e.g., creation, restoration, or enhancement of another habitat type to mitigate for adverse impacts) that demonstrates to the satisfaction of NOAA Fisheries such that it can be demonstrated that the proposed mitigation will compensate for the loss of eelgrass habitat function within the ecosystem; or (5) alternate mitigation recommendations provided by NOAA Fisheries that will achieve no net loss.

Issue 5 – Local Policies and Ordinances

Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Issue 5 Analysis of Project Effects

Less Than Significant with Mitigation Incorporated. The project is located within the City's Lagoon Overlay Zone (LO-Z), which guides development within areas identified as "wetlands" and "wetland buffer areas." To the extent practicable, the project has been sited and designed to occur within and immediately adjacent to the existing roadway/edge, outside of areas in which plant or animal life and their habitats are rare or especially valuable because of their special nature or role in an ecosystem, and in areas currently subject to disturbance or degradation by human activities and developments. The biological resources within the project site are in narrow strips of vegetation (native and non-native uplands) directly adjacent to the existing Camino Del Mar Bridge and are currently subject to disturbance from vehicle traffic, noise, and pedestrian/bicycle activities. Project consistency with the City's Municipal Code and LO-Z was considered as a guide for the proposed design and project design was modified to avoid wetland areas to the extent practicable. As described above, the project would result in temporary and permanent impacts to jurisdictional resources, which would conflict with the permitted activities within the City's LO-Z as development in wetland habitat is prohibited. Although the project would conflict with the City's LO-Z that protects biological resources in the Lagoon, physical impacts on biological resources, including wetlands, would be less than significant with implementation of mitigation measure **BIO-5**.

The City's Municipal Code also includes a tree preservation/protection ordinance. This ordinance protects Torrey pine, Monterey Cypress (*Cupressus macrocarpa*), and trees of any species that are

located in the public right-of-way. Permits to remove protected trees are typically granted or denied by the Director of Planning and Community Development reflecting associated mitigation requirements within an approved Tree Removal Permit. Pursuant to Section 23.050.070, the Design Review Board is responsible for administering and enforcing this DMMC chapter when a request for a Tree Removal Permit is a direct result of a concurrent development permit application reviewed by the Design Review Board, with powers to grant or deny the permit, as well as determination of mitigation requirements. For City projects, the City Council is the decision maker. The affected trees located within the project impact footprint are isolated to a small area of the construction zone: one is located southwest of the southern bridge abutment and ~~six~~one is ~~are~~located within the Camino del Mar roadway median south of the bridge, adjacent to residential plantings (including trees) on either side of the road. These two trees are within public right-of-way and their removal is required in order to allow bridge removal and replacement. Consistent with DMMC Section 23.50.090, the impacts/loss of these two trees would be mitigated. As proposed, two new street canopy trees would be installed within Greet Streets tree wells. Additional mitigation to cover the loss of street trees would be covered by the City's Public Tree/Landscape Management program that is administered by the City of Del Mar Public Works Department. The Program currently has a net excess of 78 public trees that were added via various Capital Improvement Program projects within the last five years including the Civic Center Redevelopment, Court Street Park, and Downtown Streetscape Plan. These credits can be applied towards future mitigation associated with City projects. Existing credits that have been added to the Program via Capital Improvement Program projects would be applied to the project to ensure compliance with Chapter 23.50 of the Del Mar Municipal Code.

Because the project would implement regulatory permitting with the resource agencies (**BIO-5**) and adhere to the City's tree protection ordinance, project impacts are considered less than significant.

Issue 5 Mitigation Measures

No additional mitigation is required.

Issue 6 – Adopted Conservation Plans

Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?

Issue 6 Analysis of Project Effects

No Impact. The project does not occur within the boundaries of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan. Therefore, no impact would occur.

Del Mar occurs within the planning boundaries of the County MSCP (County 1998). The MSCP is a multi-jurisdictional planning program designed to develop an ecosystem preserve within San Diego's incorporated and unincorporated areas. While the MSCP has been adopted for the County, no subarea plan has been approved or adopted for Del Mar. Therefore, the draft policies and guidelines of these plans are not applicable to the project. The project, however, considered the context of such draft plans and implementation of the proposed project would not preclude or prevent finalizing and adopting the plan. Compliance with existing regulations and implementation of measures **BIO-1 through BIO-5** would ensure consistency with the general conservation goals and objectives of the County MSCP.

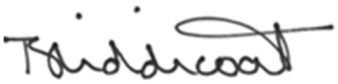
Issue 6 Mitigation Measures

No mitigation is required.

CONCLUSION

Implementation of the proposed project could result in potential significant impacts to biological resources specifically nesting birds, sensitive natural communities, and jurisdictional aquatic resources. However, the timing of project construction and implementation of the mitigation measures **BIO-1** through **BIO-6** described above would ensure potential impacts to biological resources are either avoided or minimized to remain below a level of significance. Please contact me at (619) 462-1515 or ThomasL@helixepi.com if you have questions or need assistance with project mitigation compliance.

Sincerely,



Thomas Liddicoat
Biology Project Manager/Senior Biologist

Enclosures:

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Appendix C

Archaeological Survey Report (Confidential, bound separately)

Restricted Distribution – Confidential Information

This document is confidential under Government Code Section 6254.10, Section 304 of the National Historic Preservation Act, and Section 9 of the Archaeological Resources Protection Act and has been bound separately for City of Del Mar informative purposes only. Government Code Section 6254.10 states, "Nothing in this chapter requires disclosure of records that relate to archaeological site information and reports maintained by, or in the possession of, the Department of Parks and Recreation, the State Historical Resources Commission, the State Lands Commission, the Native American Heritage Commission, another state agency, or a local agency, including the records that the agency obtains through a consultation process between a California Native American tribe and a state or local agency."

Appendix D

Preliminary Geotechnical Design Report

June 19, 2020
Kleinfelder Project No. 20180876.001A

Mr. Tim Thiele, PE, QSD
City Engineer | Michael Baker International
City of Del Mar
1050 Camino Del Mar
Del Mar, California 92014

SUBJECT: Preliminary Geotechnical Design Report
Camino Del Mar Bridge Replacement
Over San Dieguito River
Del Mar, California

Dear Mr. Thiele:

Kleinfelder is pleased to present this Preliminary Geotechnical Design Report (PGDR) for the Camino Del Mar Bridge Replacement project over San Dieguito River in Del Mar, California. This report presents the results of our geotechnical engineering investigation and provides preliminary geotechnical recommendations for the proposed replacement bridge project. This report is presented in conjunction with the Preliminary Foundation Report (PFR) for the project.

We appreciate this opportunity to be of service and look forward to continuing to work with you in the future. If you have any questions about this report or need additional services, please contact us at 619.831.4600.

Respectfully submitted,

KLEINFELDER

Janna Bonfiglio, PE 89334
Project Engineer

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DOCUMENT 6

PRELIMINARY GEOTECHNICAL DESIGN REPORT
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER
DEL MAR, CALIFORNIA
KLEINFELDER PROJECT NO. 20180876.001A

JUNE 19, 2020

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ONLY THE CLIENT OR ITS DESIGNATED REPRESENTATIVES MAY USE THIS DOCUMENT AND ONLY FOR THE SPECIFIC PROJECT FOR WHICH THIS REPORT WAS PREPARED.

A Report Prepared for:

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Engineering Manager for City of Del Mar
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PRELIMINARY GEOTECHNICAL DESIGN REPORT
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER
DEL MAR, CALIFORNIA

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June 19, 2020
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1 INTRODUCTION

The City of Del Mar has retained Kleinfelder to provide engineering services of the project plans, specifications, and estimate (PS&E) phase of the Camino Del Mar Bridge Replacement project. This Preliminary Geotechnical Design Report (PGDR) was prepared to provide preliminary conclusions and recommendations for the type selection phase of the proposed project located along Camino Del Mar and over the San Dieguito River in Del Mar, California. This PGDR was prepared in accordance with Caltrans' Geotechnical Design Report Guidelines, dated January 2020, and covers the geotechnical aspects of the project outside of the bridge structure footprint. The PGDR is a companion report to a separately provided Preliminary Foundation Report (PFR) for the proposed project. The preliminary geotechnical recommendations for the bridge structure are provided in the PFR.

The purpose of this PGDR is to present the results of our Phase 0 geotechnical field investigation, evaluate the subsurface conditions at the site, determine potential geologic and seismic hazards, perform geotechnical engineering evaluations, and provide preliminary recommendations for the geotechnical aspects of the proposed project outside of the bridge structure footprint (approximately 150 feet away from the bridge limits).

This PGDR is not intended for final design of the project. Additional investigations and analyses will be required as recommended in Section 6 of this report for final design.

1.1 SCOPE OF WORK

The purposes of our geotechnical engineering services were to evaluate the soil and geologic conditions at the site and provide preliminary conclusions and recommendations for design and construction of the proposed improvements. The scope of services for this study included the following:

- Review of readily available geotechnical and geologic information including published geologic maps, topographic maps, aerial photography, previous and nearby geotechnical reports, and as-built and conceptual drawings;
- Obtain necessary geotechnical permits and approval for performing explorations within the City of Del Mar right-of-way including preparation of a geotechnical investigation work plan;
- Coordination and oversight of utility clearance surveys, traffic control, and pavement coring for proposed exploration locations;

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- Coordination and oversight of two exploratory borings and three Cone Penetrometer Tests (CPTs) within the existing Camino Del Mar Bridge Replacement project site;
- Performing laboratory testing on collected soil samples from the borings;
- Preparation of this PGDR which includes the following:
    - A description of the existing site and proposed project improvements including a site vicinity map and a site plan showing approximate locations of field explorations;
    - Discussion of pertinent geotechnical and geologic information based on our review of existing geotechnical reports for the site and other available geotechnical and geologic information;
    - Discussion of field exploration methods, logs of borings and CPTs, and laboratory test procedures and results;
    - Discussion of the site and subsurface conditions observed during our field investigation;
    - Discussion of the regional geologic and seismic setting and potential geologic and seismic hazards at the site;
    - Seismic design parameters in accordance with the California Department of Transportation (Caltrans) 2019 Seismic Design Criteria including performance of a site-specific response analysis;
    - Preliminary recommendations for embankment fill stability and settlement;
    - Pavement section recommendations;
    - Discussion of soil corrosivity properties affecting below-grade concrete and steel; and
    - Recommendations for further field investigations.
- Preparation of a Preliminary Foundation Report (PFR), inclusive of foundation design and construction recommendations, which is provided under a separate cover.

The recommendations contained within this report are subject to the limitations presented in Section 7.0 and are in conjunction with the PFR for this project.

1.2 PROJECT DATUM

Unless otherwise noted, elevation data presented in this report are referenced to the North American Vertical Datum of 1988 (NAVD88) and the stationing is referenced from the project conceptual design drawings.

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1.3 EXISTING SITE CONDITIONS AND AS-BUILT INFORMATION

The Camino Del Mar Bridge Replacement project site is located along the coast in Del Mar, California, crossing over the San Dieguito River which flows from the east and discharges into the Pacific Ocean. Based on our review of the project conceptual drawings and the topographic survey prepared by Sampo Engineering, Inc. and dated April 13, 2018, the site limits extend from approximately 400 feet north of the northern end of the bridge (approximate Station 170+00), near the access point to Del Mar North Beach, to approximately 400 feet south of the southern end of the bridge (approximate Station 156+00), just south of Sandy Lane. The approximate 596-foot-long existing bridge structure extends from approximate Station 166+00 at the northern end to approximate Station 160+00 at the southern end. The general site vicinity is shown on Figure 1 and the existing conditions of the site are provided on Figure 2. The coordinates of the approximate center of the bridge structure are:

Latitude: 32.9750 °N Longitude: -117.2690°W

The project site is bounded by the on-grade portion of Camino Del Mar roadway which eventually intersects with Via De La Valle to the north and Sandy Pointe to the south. The existing San Dieguito River and the Del Mar Racetrack venue bounds the project site to the east and the Del Mar North Beach, residential housing, and the Pacific Ocean bounds the project site to the west. The extents of the recreational beach areas located below and beyond the southern and northern portions of the bridge are dependent upon the season (dry or rainy season) and typical tidal changes of approximately 4 feet throughout the day (NOAA, 2020). Based on our review of National Oceanic and Atmospheric Administration (NOAA) tidal information, we understand that typical current tide elevations range from approximate elevation +0 to +4 feet throughout the day.

At the southern area of the bridge, existing grades of the beach area below the bridge generally range from approximate elevations +5 to +9 feet with a berm having an approximate slope inclination of 1½ horizontal to 1 vertical (1½H:1V) and ranging in elevation from approximately +6 to +16 feet extending up from the beach area to the bridge abutment. The surface of this berm at the south end of the bridge is covered with rip-rap and some vegetation for erosion control.

Within the northern area of the bridge, existing grades of the beach area generally range from approximate elevations +5 to +8 feet with the roadway elevation at approximately +18 feet extending up from the beach area to the bridge abutment. The slope inclination of this berm is up to approximately 1¼H:1V and this slope is also covered with rip-rap and some vegetation for erosion control.

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Based on our site reconnaissance, our review of as-built drawings (Powell and T.Y. Lin, 2001; Caltrans, 1951), and our review of the topographic survey, current conditions at the project site consist of the reinforced concrete girder bridge supported by ten piers and two abutments. Per the as-built plans and bridge inspection reports, the existing bridge was built in 1932 and widened with a pedestrian walkway and curb in 1953. Additional improvements to the bridge including replacement of pavements, pedestrian walkway, and railings were performed in 2001. Our review of the as-built drawings for the existing bridge indicates that the existing abutments and piers are supported on timber piles. Outside of the bridge limits, asphalt concrete (AC) pavement exists along the on-grade approach embankments along Camino Del Mar. A concrete median filled with landscaping separates the northbound and southbound directions of Camino Del Mar. Concrete sidewalks line the east and west sides of the on-grade portion of Camino Del Mar to the north and south of the bridge. An existing wire fence is located along the eastern sidewalk to the north of the bridge due to the steep embankment slopes extending along the east side of the street. Furthermore, street signs for pedestrian crosswalks are also present just south and north of the existing bridge.

The as-built drawings also indicate potential abandoned timber piles from an abandoned highway bridge located to the west of the existing Camino Del Mar bridge as well as for an abandoned pipeline trestle located adjacent to the east side of the existing bridge. Some of these abandoned timber piles can currently be observed to the west of the site.

Based on our site reconnaissance, utilities observed at the site include a 12-inch-diameter high pressure gas line and a 12-inch-diameter sanitary sewer line which are hung from the eastern side of the bridge and traverse the eastern side of the on-grade portion of Camino Del Mar. Additionally, a 4-inch-diameter high pressure gas line is hung from the western side of the bridge and traverses the western on-grade portion of Camino Del Mar. Communications markers and a an electrical box were also observed to the east of the Camino Del Mar roadway.

The existing conditions of the project site are presented on Figure 2.

1.4 PROJECT DESCRIPTION

Based on discussions with the project design team, the proposed project is still in the bridge type selection phase and we understand that, after assessment of several alternatives, five bridge options are still currently being considered. These alternatives consist of three 5-span and 6-span cast-in-place box girder bridge options as well as two 6-span precast concrete girder bridge options. The proposed bridge structure will be constructed in a two-phased system allowing

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continuous traffic flow during construction. The locations of the abutments and bents for each option vary but are anticipated to consist of constructing the proposed abutments behind the existing abutments and keeping portions of the existing abutments in place as additional scour and erosion protection.

Based on conversations with the project team and review of the draft conceptual plans, we understand that the design storm elevation is +14.55 feet corresponding to the 50-year storm plus 2 feet of freeboard water elevation. Due to this design storm elevation, the proposed bridge is required to be raised to a higher level than the existing bridge. We understand that several grading profiles are currently being evaluated that will require new approach fills and retaining walls extending from the edges of the abutments along the on-grade portion of Camino Del Mar. At this stage of the project, we understand that the proposed approach retaining walls have not yet been selected and that the final wall dimensions are still under design. Based on the conceptual plans, the proposed approach fills are anticipated to be highest at the bridge abutment and will be graded to meet existing roadway grades away from the bridge. The extents of the approach fills are approximately 300 feet to the north and south of the proposed abutments. However, only the first approximate 80 to 100 feet of the approach fills from the abutments are proposed to be retained by retaining walls on both sides. Therefore, retaining walls are addressed as part of the PFR.

In order to place the proposed approach fills, the existing asphalt pavement along the on-grade portion of Camino Del Mar will be demolished. Upon completion of fill placement, the on-grade surficial pavement will be replaced with new asphalt concrete pavement and an approximate 30-foot-long concrete approach slab. Temporary cuts are anticipated to be required outside of the bridge footprint for re-alignment of existing utilities at the site as well for remedial grading.

1.5 EXCEPTIONS TO POLICY

No exceptions to policy were taken for the preparation of this PGDR.

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2 GEOTECHNICAL INVESTIGATION

Our preliminary geotechnical investigation (Phase 0 investigation) consisted of advancing two exploratory borings and three cone penetrometer tests (CPTs). The borings and two of the CPTs were performed within accessible areas near the existing bridge abutments. A third CPT was performed on the existing bridge deck near the central portion of the Camino Del Mar bridge. Laboratory testing and review of existing geotechnical and geologic information were also performed for our geotechnical investigation. The approximate locations of the borings and CPTs performed by Kleinfelder are shown on Figures 2 and 3.

2.1 REVIEW OF EXISTING GEOTECHNICAL INFORMATION

2.1.1 Previous Geotechnical Reports for Camino Del Mar Bridge

The following previous geotechnical reports have been reviewed as part of our scope:

- "Preliminary Geotechnical Design Report (PGDR), Camino Del Mar Bridge Replacement (Bridge No. 57C-0209), Del Mar, California," prepared by Ninyo & Moore, dated July 31, 2018.
- "Preliminary Foundation Report (PFR), Camino Del Mar Bridge Replacement (Bridge No. 57C-0209), Del Mar, California," prepared by Ninyo & Moore, dated July 31, 2018.
- "Progress Report of Foundation Investigation on Road XI-SD-2-SD,A, San Dieguito River Basin, Station 1216 to Station 1280," prepared by the California Department of Public Works, Division of Highways (as available online on GeoDOG), dated May 25, 1960.
- "Supplemental Report of Foundation Investigation on Road XI-SD-2-SD,A, San Dieguito River Basin, Station 1216 to Station 1280," prepared by the California Department of Public Works, Division of Highways (as available online on GeoDOG), dated September 12, 1960, and associated logs of the borings (LOTBs).

The Ninyo & Moore reports were prepared for the Camino Del Mar Bridge Replacement project in which the results of two borings, designated as B-7 and B-8, and two CPTs, designated as CPT-11 and CPT-12, performed in March 2013 were presented. Boring B-7 and CPT-11 were performed near the existing northern bridge abutment extending to reported depths of approximately 81½ feet and 155 feet below ground surface (bgs), respectively. Boring B-8 and CPT-12 were performed near the existing southern bridge abutment and extended to reported depths of approximately 95 feet and 196 feet bgs, respectively.

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In general, Ninyo & Moore reported undocumented fill material overlying successive strata of alluvium and the Del Mar Formation. The fill reportedly extended to depths of up to approximately 12 to 14 feet bgs and generally consisted of brown and light gray, very loose to medium dense silty sand with trace amounts of shells, gravel, and asphalt fragments.

Alluvium consisting of gray and black, very loose to very dense silty sands with trace amounts of gravel interlayered with soft to very stiff lagoonal silts and clays was reported below the fill in all of the Ninyo & Moore borings and CPTs. The alluvium extended to the termination depth of the borings (up to 95 feet bgs) and to the termination depth of CPT-12 (approximately 195 feet bgs) located at the southern end of the bridge. Ninyo & Moore stated in their report that the alluvium extended to the termination depth of all CPTs performed at the site; however, a cross-section was provided by Ninyo & Moore in their report showing a contact with the underlying Del Mar Formation at CPT-11 located at the northern end of the bridge. The contact was shown at approximately 145 feet bgs on the cross-section. Based on our review of the CPT logs provided in the Ninyo & Moore report, our review of other available geologic information in the site vicinity, and the results of our field investigation as presented in Section 3.2 of this report, we anticipate that the Del Mar Formation was encountered at approximately 145 feet bgs at the CPT-11 location as shown on the Ninyo & Moore cross-section.

Groundwater was encountered in the Ninyo & Moore borings at depths of approximately 12½ feet and 14 feet bgs, or at approximate elevations +1½ feet and +3 feet, and surface water was observed within the San Dieguito River.

The progress and supplemental reports prepared by the Division of Highways in 1960 provide insight on the embankment construction proposed by the State over 50 years ago prior to construction of the Camino Del Mar bridge, indicating deeper fills may be present at the site, particularly near the abutment areas.

The Ninyo & Moore boring and CPT logs, exploration plan, geologic cross section, and laboratory test results, along with the Division of Highway LOTBs, are provided in Appendix E.

2.1.2 Nearby Geotechnical Reports and LOTBs

Previous geotechnical reports and other available geotechnical information for projects located in the site vicinity were also reviewed and include the following:

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- "San Dieguito River Bridge Replacement, Double Track and Del Mar Fairgrounds Special Events Platform (Milepost 242 to Milepost 244) 90% Design, Draft Foundation Report, Bridge 243.0," prepared by Leighton Consulting, Inc., dated May 5, 2017.
- "Foundation Investigation for Jimmy Durante Bridge, Del Mar, California," prepared by Robert Prater Associates, dated May 1980 (as available online on GeoDOG).
- Various Foundation Reports, LOTBs, and geologic and seismic letters regarding various stages of construction and widening of the I-5 bridge over San Dieguito River spanning from 1962 to 2004, as available online on GeoDOG.

These available geotechnical documents provide further information regarding the geologic conditions in the site vicinity. These reports were completed by others for the bridges spanning across the San Dieguito River up channel from our site and include the heavy rail bridge located 550 feet to the east of the site, the Jimmy Durante Blvd bridge located 2,500 feet to the east of the site, and the I-5 bridge located 5,700 feet to the east.

The quantity and quality of information provided in the previous reports varies. The Leighton Consulting investigation performed for the heavy rail bridge located just east of the site reports that a relatively thin layer of young flood plain deposits overlies deep alluvium in the borings and CPTs performed near the river crossing. The borings performed near the river crossing terminated in the alluvium at a depth of 76½ feet bgs. The CPTs performed near the crossing reportedly refused on the Del Mar Formation at depths ranging from 140½ feet to 222 feet bgs.

The Robert Prater Associates foundation investigation report reviewed for the Jimmy Durante Boulevard bridge replacement reports the results of three exploratory borings, two performed at the ends of the existing bridge at the time of the report, and one performed within the middle of the bridge over the San Dieguito River. The boring logs provided in this report indicate artificial fill materials extending to depths of 12 and 13 feet at the ends of the bridge overlying natural soils consisting of loose to very dense sandy silt, silty sand, and poorly-graded sand. Boring EB-1, performed at the northern end of the bridge, terminated in these natural overburden soils at a depth of 53 feet bgs. These sandy materials were reportedly underlain by formational claystone at a depth of approximately 41 feet in Boring EB-2, performed at the southern end of the Jimmy Durante bridge, and formational sandstone at a depth of approximately 48 feet in boring EB-3, performed in the center of the bridge.

The LOTBs for the I-5 bridge widening project in 1991 near the San Dieguito River crossing reports deep estuary deposits overlying the Del Mar Formation at a depth of approximately 140 feet bgs.

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2.2 CURRENT FIELD EXPLORATIONS

2.2.1 Rotary Wash Borings

Two rotary-wash boreholes, designated as R-20-001 and R-20-002, were drilled near the existing abutments of the Camino Del Mar Bridge. Borings R-20-001 and R-20-002 were completed using augering techniques in the upper soils and then rotary wash techniques below groundwater and were performed to depths of approximately 151 feet and 208 feet below ground surface (bgs), or to approximate elevations -135 feet and -192 feet, respectively. The drilling was performed by Pacific Drilling Co. between February 10th and February 21st, 2020 using a truck-mounted drill rig equipped with 8-inch outer-diameter hollow stem augers and a 4-inch-diameter tri-cone roller bit. Prior to drilling the borings, a public utility mark-out was performed and nearby utilities were located within the City of Del Mar right-of-way (ROW) using geophysical surveys performed by Southwest Geophysics. Additionally, the surface pavement was cored by Cut N Core and the first 5 to 6 feet of each borehole were advanced by manual hand auger to further clear for underground utilities.

A field engineer from our office logged the subsurface conditions encountered in the boreholes and collected soil samples for further evaluation and laboratory testing. Selected bulk and relatively intact samples were retrieved from the boreholes at selected sampling depths, sealed, and transported to our laboratory for further evaluation. The intact samples were retrieved using either a Standard Penetration Test (SPT) split-spoon sampler or a California sampler. The number of blows necessary to drive the samplers 18 inches, using a 140-pound automatic hammer dropped from a height of 30 inches, were recorded by our field engineer. Graphic notations on the borehole logs indicate which sampler type was utilized at each sampling location.

Upon completion, the boreholes were backfilled with bentonite and patched at the surface with asphalt concrete (AC). Soil cuttings were stored in 55-gallon steel drums and, upon completion of laboratory waste characterization testing, were disposed of offsite.

The geotechnical boring logs are presented in Appendix A and on the Log of Test Borings (LOTBs) in Appendix D and the locations of the borings are presented on Figures 2 and 3. The subsurface conditions encountered during drilling are described further in Section 3.2 of this report.

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2.2.2 Cone Penetrometer Tests (CPTs)

Four cone penetrometer tests (CPTs), designated as CPT-20-001, CPT-20-002, CPT-20-002A, and CPT-20-003, were performed by Fugro between February 18th to February 21st, 2020. The CPTs, which include advancement of one seismic CPT (SCPT), were advanced to depths ranging from 16 to 200 feet below the ground surface or bridge deck. The CPTs were advanced using a truck-mounted CPT drill rig with a 30-ton push capacity equipped with a 15cm^2 cone-shaped probe attached to cylindrical steel rods instrumented with a cylindrical-shaped friction sleeve and pore pressure transducer. During advancement of the CPTs, the cone tip penetration resistance, friction resistance along the friction sleeve, and pore water pressure were recorded. For the SCPT, shear wave velocity measurements were taken at 5-foot intervals using a cone tip equipped with geophones.

CPT-20-001 and CPT-20-003 were performed near the existing bridge abutments and were advanced to depths of approximately 158 feet and 200 feet, or to approximate elevations of -142 feet and -184 feet, respectively. CPT-20-002 and CPT-20-002A were performed through the bridge deck near the center of the existing bridge. The CPTs performed within the bridge deck required casing to be installed from the bridge deck to below the mud line of the river channel to support the CPT rods. CPT-20-002 was quickly abandoned at 16 feet below the bridge deck after beginning the CPT due to sinking of the casing and CPT rods into the soft, underlying soils in the river channel. Therefore, CPT-20-002A was advanced at the same location as a second attempt to perform the CPT on the bridge deck but refused at a depth of approximately 37 feet below the bridge deck, or at approximate elevation of -21 feet.

Prior to advancement of the CPTs, public and private utility locating was performed and the surficial pavement was cored. The first approximate five feet of the CPTs performed near the bridge deck were advanced by manual hand auger to further clear for underground utilities. Upon completion of the CPTs, the rods were extracted and the surface was patched with either AC near the abutments or concrete within the bridge deck. A detailed description of the CPT methodology, logs of the CPTs, and the SCPT shear wave velocity measurements are presented in Appendix B. Subsurface conditions interpreted from the CPT data are presented in Section 3.2.

2.3 LABORATORY TESTING

A laboratory testing program was conducted to substantiate field classifications and evaluate selected physical characteristics and engineering properties of the soils encountered. Moisture content, unit weight, Atterberg Limits, sieve analyses, R-value, direct shear, unconfined

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compression, unconsolidated undrained triaxial compression (TXUU), and corrosion tests were performed in general accordance with the applicable American Society of Testing and Materials (ASTM) or Caltrans test methods. Results of the laboratory testing program are presented in Appendix C.

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3 GEOTECHNICAL CONDITIONS

3.1 REGIONAL SETTING

In addition to our review of previous and nearby geotechnical reports and LOTBs, our geologic evaluation also consisted of reviewing available aerial photographs, topographic maps, soil survey results, and geologic maps along with observation of the existing site conditions during our subsurface investigation. The results of the evaluation are included in the following sections.

3.1.1 Soil Survey

Based on our review of the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) web soil survey results (accessed May 2020), the surficial deposits at the site consist of lagoon water (LG-W) underneath the existing bridge, Tujunga Sand (TuB) to the south of the bridge, and tidal flats (Tf) to the north of the bridge.

Tujunga sand is reported to primarily consist of 'somewhat excessively drained' fine sand, gravelly sand, loamy sand, and gravelly loamy sand having a hydrologic soil group A, negligible runoff class, and high to very high infiltration capacity. Tidal flats are reported to have a negligible runoff class but are reported to be Hydrologic Soil Group D and be very poorly drained due to the depth of the water table and frequency of flooding where these are mapped.

3.1.2 Geologic Setting

The site is located within the coastal zone of the Peninsular Ranges Geomorphic Province (Norris and Webb, 1990). This province stretches from northern Los Angeles County to the tip of Baja California and is dominated by mountainous terrane composed of Cretaceous-age igneous rocks of the Southern California Batholith and various Jurassic-age metamorphic rocks. The lower-lying flanks of this basement complex are covered with a variety of younger sedimentary rocks. Within San Diego County, these sedimentary rocks consist of a westward thickening clastic wedge comprised of three sequences of deposits.

The oldest sequence consists of claystone, siltstone, sandstone, and conglomerate deposited during the late Cretaceous time as an apparent submarine fan (Abbott, 1999). These units crop out on Mt. Soledad in La Jolla, Point Loma, and Carlsbad. The second sequence of sediments was deposited during the Tertiary (Eocene and Pliocene) period within an embayment that stretched from northern San Diego County into Mexico (Kennedy, 1975). The sediments consist of a variety of claystone, siltstone, sandstone, and conglomerate. The most recent sedimentary

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deposits consist of early to late Pleistocene, near-shore marine, estuarine, and delta deposits, also typically identified as terrace deposits. Most of these sediments were deposited on wave cut surfaces (terraces) developed in response to sea level fluctuations during the Pleistocene. The oldest terrace deposits (Qvop), deposited during the early to middle Pleistocene, and the youngest terrace deposits (Qop), deposited during the late Pleistocene, have been mapped throughout the coastal region of San Diego County including in the vicinity of the project site.

During the late Pleistocene, the land surface throughout San Diego County was down-cut and eroded by fluvial processes in response to a world-wide, glacially-induced drop in sea level. This erosional event resulted in the dissected system of east to west flowing drainages and intervening basins that empty into the Pacific Ocean. Near the coast, these drainages were down-cut several hundreds of feet below current sea-level elevations. Near the end of the Pleistocene epoch and continuing up to the present, sea level gradually rose as the continental glaciers receded. This event forced in-filling of the eroded drainages with alluvial sediments which range in age from the latest Pleistocene to recent times. The project site is located within one of these drainages associated with the San Dieguito River. The surrounding highlands to the north and south are comprised of Pleistocene-age old paralic deposits (Qop6) deposited over Eocene-age sedimentary rocks consisting of the Del Mar Formation (Td) and the Torrey Sandstone (Tt). These deposits are shown on the Regional Geologic Map presented as Figure 4.

3.1.3 Tectonic Setting

California is one of the most tectonically active areas of the United States. The high seismicity of California is attributed to the fact that the state straddles the boundary of two global tectonic plates known as the North American Plate (on the east) and the Pacific Plate (on the west). The main plate boundary fault is defined by the San Andreas fault which crosses through some of the most densely developed areas of both Southern and Northern California. This fault stretches northwest from the Gulf of California in Mexico, through the desert region of the Imperial Valley, crossing the San Bernardino region, and traversing up into northern California, where it eventually trends offshore near San Francisco (Jennings, 1994; Jennings and Bryant, 2010). Within Southern California, the plate boundary is actually a complex system of numerous faults known as the San Andreas Fault System (SAFS) that spans a 150-mile-wide zone from the main San Andreas fault in the Imperial Valley, westward to offshore of San Diego (Powell et al., 1993; Wallace, 1990).

The major faults east of the site (from east to west) include the San Andreas, San Jacinto, and Elsinore faults. Major faults west of the site are all offshore and include the Rose Canyon-Newport-Inglewood, Palos Verdes-Coronado Bank, San Diego Trough, and San Clemente faults

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(Kennedy and Welday, 1980). The most dominant zone of active faulting within the San Diego region is the Rose Canyon Fault Zone (RCFZ).

Approximately 49 mm/yr of overall lateral displacement has been measured geodetically as fault slip across these plate boundaries. The Elsinore, San Jacinto, and San Andreas faults combined account for up to approximately 41 mm/yr of the total plate displacement (84 percent), meaning that the remaining 8 mm/yr (16 percent) is accommodated across the offshore faults to the west of the site (Bennett et al., 1996). Studies within the Rose Canyon, east of Mount Soledad, have revealed fault strands that have displaced Holocene soil horizons with slip rates from 1 to 2.4 mm/yr (Rockwell, 2010).

The RCFZ may be part of a more extensive fault zone that includes the Offshore Zone of Deformation and the Newport-Inglewood fault to the north (Grant and Shearer, 2004; Sahakein, et al., 2017), and several possible extensions southward, both onshore and offshore (Treiman, 1993). The RCFZ is composed of predominantly right-lateral strike-slip faults that extend north to northwest through the San Diego metropolitan area towards La Jolla, however, various fault strands display normal, oblique, or reverse components of displacement as well. The fault zone extends offshore at La Jolla and continues north-northwest subparallel to the coastline. To the south in the San Diego downtown area the fault zone appears to splay out into a group of generally right-normal oblique faults extending into San Diego Bay (Treiman, 1993).

The closest fault to the site is the off-shore portion of the Rose Canyon-Newport-Inglewood connected fault located approximately 2.2 miles west of the site. The locations of this and other nearby faults with respect to the site is shown on the regional fault and seismicity map shown on Figure 5.

3.2 SURFACE AND SUBSURFACE CONDITIONS

Geologic units observed in the borings consist of successive strata of recent alluvial deposits, young alluvial deposits, young estuarine deposits, old alluvial deposits, and the Del Mar Formation. The alluvial deposits underly surficial pavement and artificial fill material and overly the Del Mar Formation. The areal extent of these geologic units is depicted on the regional geologic map in Figure 4. Artificial fill soils overlie the alluvial deposits and existing AC pavement caps the fill soils at the surface at the approach embankments on both the north and south sides of the existing bridge. Detailed descriptions of these units are provided on the boring logs in Appendix A and generalized descriptions are provided in the subsequent sections below.

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Additionally, the subsurface geologic conditions are also depicted on the geologic cross-section in Figure 6.

3.2.1 Surficial Pavement

Asphalt concrete (AC) was encountered at the surface of all the boring and CPTs performed for our study. The surficial AC was measured to be approximately 5 to 6 inches thick in the borings and CPTs performed near the abutments. At the CPT-20-002/2A location, a 5-inch-thick surficial AC layer was underlain by approximately 12 inches of reinforced concrete associated with the bridge deck.

3.2.2 Artificial Fill (af)

Artificial fill soils were encountered underlying the surficial pavement in the borings and CPTs performed near the abutment. The fill material generally consists of yellowish red, dark yellowish brown, strong brown, and light brownish gray poorly graded sand with variable amounts of silt and trace amounts of gravel. The fill layer extends to depths of approximately 9 feet bgs in boring R-20-001 located near the existing northern abutment, or to approximate elevation +7 feet, and to 8½ feet bgs in boring R-20-002 located near the existing southern abutment, or to approximate elevation +7½ feet. Based on our review of previous plans, these fills were likely placed for the existing bridge embankments and it is possible that deeper fills may be present beyond our exploration locations. Field SPT penetration blow counts (field N-values corrected only for sampler type) of the fill material ranged from 10 to 26 blows per foot (bpf) corresponding to medium dense material.

No earthwork reports were available for our review documenting placement and/or compaction of the encountered fill. Therefore, the existing fill at the site is considered undocumented.

3.2.3 Recent Alluvial Deposits (Qa)

Recent alluvial deposits were encountered underlying the fill materials in the borings and CPTs performed near the existing abutments and were encountered at the ground surface below the bridge deck in CPT-20-002/2A. The recent alluvial materials generally consist of brown, gray, and dark gray silty sand and poorly graded sand with various amount of silt and gravel. An interbedded lean to fat clay layer was encountered within the recent alluvium in boring R-20-001 and CPT-20-001 at the northern end of the existing bridge. This clayey layer likely pinches out towards the south as evidenced by the subsurface conditions encountered in CPT-20-002A, CPT-20-003, and boring R-20-002. This geologic unit was recently loosely deposited by the flow of the San

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Dieguito River as evidenced by field SPT N-values ranging from 2 to 34 bpf for coarse-grained layers and 4 to 8 bpf for fine-grained layers, corresponding to very loose to dense and soft to medium stiff materials. Furthermore, CPT tip resistances in this unit generally ranged from approximately 5 to greater than 200 tsf and field pocket penetrometer values of 0 tsf were observed in the fine-grained samples of this unit. It should be noted that the presence of gravel may result in unreasonably high SPT N-values or tip resistances.

The thickness of the recent alluvial deposits varies at the site with thicker recent alluvium at the northern end of the existing bridge. The recent alluvium extends to a depth of approximately 48 feet bgs in the explorations performed at the northern end of the bridge, or to approximately elevation -32 feet. At the southern end of the existing bridge, the recent alluvium extended to a depth of approximately 30 feet bgs, or to approximate elevation -14 feet. CPT-20-002A, performed within the center of the bridge, terminated in the recent alluvial deposits.

3.2.4 Young Alluvial Deposits (Qya)

Middle Holocene-age young alluvial deposits were encountered underlying the recent alluvial deposits in the borings and CPTs performed near the existing abutments. This unit generally consists of dark gray silty sand and poorly graded sand with various amount of silt and trace amounts of gravel and shells and thin interbedded clayey layers. This unit was encountered to be loose to very dense as evidenced by field SPT N-values ranging from 8 to greater than 50 bpf, with an average field SPT N-value of 33 bpf, and CPT tip resistances generally ranging from approximately 20 to greater than 300 tsf.

The thickness of the young alluvial deposits was encountered to be approximately 37 feet thick in explorations performed near the northern abutment and approximately 48 feet thick in the explorations performed at the southern abutment. The young alluvium extended to depths of approximately 78 to 85 feet bgs, or to approximate elevations of -62 feet and -69 feet, at the southern and northern abutments, respectively.

3.2.5 Young Estuarine Deposits (Qyes)

Below the young alluvial deposits, a relatively thin layer of young estuarine deposits was encountered in the borings and CPTs performed near the abutments. This geologic unit generally consists of an approximate 6 to 8-feet thick black and dark gray, low to medium plasticity, lean clay with trace amounts of sand, mica, and shells. The fine-grained conditions encountered in this unit represent a pause in sea-level rise which occurred at the end of the Pleistocene indicating a transition from the young alluvium overlying above and old alluvium below.

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The young estuarine deposits extended to a depth of approximately 95 feet bgs in the explorations performed at the northern end of the bridge, or to approximately elevation -79 feet. At the southern end of the existing bridge, the recent alluvium extended to a depth of approximately 94 feet bgs, or to approximate elevation -78 feet. Field pocket penetrometer values of 0.5 tsf were observed in this unit and SPT N-values in this unit ranged from approximately 8 to 21 bpf, with an average of approximately 12 bpf, indicating stiff to very stiff fine-grained materials. Furthermore, CPT tip resistances generally ranged from approximately 9 to 36 tsf in the fine-grained portions this unit.

3.2.6 Old Alluvial Deposits (Qoa)

Pleistocene-age old alluvial deposits were encountered underlying the young estuarine deposits in the borings and CPTs performed near the existing abutments. The old alluvial materials generally consist of very dark gray silty sand and poorly graded sand with silt. Boring R-20-002 and CPT-20-003 refused and terminated in the old alluvium unit at depths of approximately 200 and 208 feet bgs, or at approximate elevations of -184 feet and -192 feet, as gravel content increased in the old alluvium. In boring R-20-001 and CPT-20-001 performed near the northern abutment, the old alluvium extended to a depth of approximately 146 feet bgs, or to approximate elevation -130 feet. The old alluvial deposits were encountered to be medium dense to very dense as evidenced by field SPT N-values ranging from 10 to greater than 50 bpf, with an average of approximately 30 bpf, and CPT tip resistances generally ranging from approximately 30 tsf to greater than 300 tsf.

3.2.7 Del Mar Formation (Td)

The Del Mar Formation is an Eocene-age geologic unit deposited in an ancient lagoonal environment. This formation was encountered below the old alluvial deposits at the northern end of the bridge in boring R-20-001 and CPT-20-001 at an approximate depth of 146 feet, or approximate elevation -130 feet. This geologic contact is generally consistent with the contact of the Del Mar Formation reported in Ninyo & Moore CPT-11 which was also performed near the northern end of the bridge. The Del Mar Formation was penetrated to a depth of 5 feet and was observed in one sample to consist of dark reddish brown with grayish green claystone. This unit is known to have interbedded sandstone layers. Field SPT N-values of the Del Mar Formation were greater than 50 bpf and CPT tip resistances generally ranged from 100 to 300 tsf corresponding to very dense material.

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3.3 GEOLOGIC HAZARDS AND UNSUITABLE MATERIALS

3.3.1 Landslides

Landslides are deep-seated ground failures (several tens to hundreds of feet deep) in which a large arcuate or block shaped section of a slope detaches and slides downhill. Landslides can cause damage to structures both above and below the slide mass. Several formations within the San Diego region are particularly prone to landslides. These formations generally have high clay content and mobilize when they become saturated. Other factors, such as steeply-dipping bedding that project out of the face of the slope and/or the presence of fracture planes, will also increase the potential for a landslide.

The nearest substantive slope to the site is located approximately 400 feet to the north. This slope is part of the coastal bluff and is comprised of the Del Mar Formation. The Del Mar Formation is known for instability in steep slopes. However, due to the distance to the project site from these slopes and the relatively flat-lying site topography outside of the bridge footprint, it is our opinion that the hazard with respect to a landslide impact at the site is low.

3.3.2 Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or pavements supported on grade.

Visual classification of the soils near anticipated subgrade elevations indicates that these soils primarily consist of non-plastic poorly-graded sand with small amounts of silt. Based on the results of our field investigation and review of existing information, it is our opinion that the site soils near the ground surface generally have a very low to low expansion potential. Isolated zones of more expansive soil may also be encountered near the surface but are not anticipated.

3.4 SURFACE WATER AND GROUNDWATER

Groundwater was encountered in all the borings and CPTs performed for our field investigation. Encountered groundwater depth ranged from approximately 11 to 14 feet bgs, or at approximate elevations +5 to +2 feet, during drilling. Upon completion of drilling, the groundwater levels were measured to be approximately 17 feet bgs, or approximate elevation -1 foot. It should be noted

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that the borings were converted into rotary wash upon encountering groundwater. Circulation of water and drilling mud in the boreholes are required as part of the rotary wash drilling. Therefore, water level measurements after completion of the borings may have been influenced by introduction of water and drilling fluids in the boreholes. Also, some rains occurred prior to and during our field investigation and a rise and fall in the water surface level within the San Dieguito River channel was observed.

The Ninyo & Moore borings for this site reported groundwater at depths of approximately 12½ and 14 feet bgs, or at approximate elevations +1½ feet and +3 feet.

Due to the proximity of the site to the coast, groundwater levels are expected to fluctuate due to tidal and seasonal influences. Based on our available information review, we understand that historic minimum and maximum tidal elevations range from approximate elevation -3 feet to +7½ feet (NOAA, 2020). The design storm elevation for the project is determined to be +14.55 feet based on the draft conceptual plans.

The flood hazard potential for the site was evaluated based on the Federal Emergency and Management Administration (FEMA) Flood Insurance Rate Maps (FIRM). These maps identify those areas that may be subject to special flood events. According to FEMA FIRM 06073C1307H dated December 20, 2019, the site is located within a regulatory floodway flood hazard area with a base flood elevation of 12 feet NAVD 88. Therefore, the hazard at the site with respect to flooding is considered high and flood loads should be considered in the design in accordance with the AASHTO Bridge Design Specifications. We understand that a design flood elevation of +14.55 feet is currently being used for design which corresponds to a 50-year event plus two feet of freeboard.

3.5 EROSION AND SCOUR

Scour is the loss of ground by erosion in flowing water environments caused by changes in flow volume, flow velocity or flow direction. Scour can occur over the width of the stream or river bed and can be concentrated at locations in which hard protrusions occur in a river bed, such as at bridge piers. The San Dieguito River channel may scour during high flow events along the existing embankment slopes to the north of the bridge outside of the proposed bridge footprint. We understand that the existing rip-rap slope protection will be maintained to protect these slopes from surficial erosion from high flow events.

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4 PRELIMINARY SEISMIC INFORMATION AND RECOMMENDATIONS

Kleinfelder has reviewed the site with respect to potential seismic hazards. This evaluation is based on review of available geologic maps, aerial photographs, topographic maps, hazard maps, our geologic site reconnaissance, boring, CPT, and laboratory data, and engineering analyses. Potential seismic hazards considered in our study include surface fault rupture, seismic shaking, liquefaction and seismically induced settlement, and tsunamis. The following sections discuss these hazards and their potential at this site in more detail.

4.1 POTENTIAL SEISMIC HAZARDS

4.1.1 Surface Fault Rupture

As previously discussed in Section 3.1, the subject site is not underlain by any known active or potentially active faults. The closest active fault is the Rose Canyon-Newport Inglewood off-shore fault which is located approximately 2.2 miles offshore to the west of the site. The results of our site reconnaissance and review of historical aerial photography did not reveal indications of faults crossing the project site. Based on this data, it is our opinion that the potential for ground rupture due to faulting at the site is negligible.

4.1.2 Liquefaction and Seismic Settlement

The term liquefaction describes a phenomenon in which saturated, cohesionless soils temporarily lose shear strength (liquefy) due to increased pore water pressures induced by strong, cyclic ground motions during an earthquake. Structures founded on or above potentially liquefiable soils may experience bearing capacity failures due to the temporary loss of foundation support, vertical settlements (both total and differential), and undergo lateral spreading. The factors known to influence liquefaction potential include soil type, relative density, grain size, confinement, depth to groundwater, and the intensity and duration of the seismic ground shaking. Liquefaction is most prevalent in loose to medium dense sandy and gravely soils below the groundwater table but can also occur in non-plastic to low plasticity fine-grained soil.

Based on the guidelines provided for liquefaction evaluation in the Caltrans Geotechnical Manual (Caltrans, 2020), evaluations of potential liquefaction susceptibility based on groundwater level, deposit age, and soil composition were made according to the criteria of Youd et al. (2001), Boulanger and Idriss (2006), and Caltrans' Geotechnical Manual. For CPT analyses, we used the recommendations of Youd et al. (2001) to consider layers with soil behavior type index, I_c<2.6 as potentially liquefiable. It should be noted that based on these criteria, the old alluvial deposits

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were considered to have a low liquefaction susceptibility based on the age of the geologic deposits.

For layers that met the compositional criteria, liquefaction triggering (factor of safety) analyses were performed using methodologies proposed by Youd et al. (2001) (NCEER, 2001). The analyses utilized both SPT data from our boreholes and tip resistance from our CPTs. In order to perform liquefaction analysis, estimated earthquake magnitude (M_w) and peak ground acceleration (PGA) are needed. Liquefaction analyses were evaluated for a magnitude of 6.63 and a PGA of 0.41g based on Caltrans ARS Online V3.0.1. A groundwater depth of 10 feet was used in our analysis for the explorations performed near the abutments based on potential fluctuations of groundwater level due to tidal influence.

Based on the Liquefaction Evaluation Guidelines in Caltrans' Geotechnical Manual, liquefaction triggering potential was only evaluated for the upper 70 feet and liquefaction-induced volumetric settlements are only reported for induced settlements in the upper 50 feet. It should be noted that there is a potential for liquefaction to occur at deeper depths based on our analyses; however, due to the depths of these deposits and associated overburden stresses, liquefaction at these depths are likely to not result in volumetric surface settlements.

Liquefaction-induced volumetric settlements were estimated using the methods of Tokimatsu and Seed (1987) and Zhang et al. (2002). Based on the methods used, the seismic loading, and the site conditions, the calculated post-liquefaction vertical volumetric settlements within the upper 50 feet of the soil profile generally ranged from 3 to 7 inches.

Another type of seismically-induced ground failure that can occur as a result of seismic shaking is dynamic compaction, or seismic settlement. This phenomenon typically occurs in unsaturated, loose to medium dense granular material or poorly-compacted fill soils. The granular fill soils encountered above the groundwater table at the site were generally found to be in a medium dense condition. We evaluated seismic settlement potential of the existing artificial fill soils using the method of Tokimatsu and Seed (1987). Based on the results of the borings and CPTs and the seismic loading, we calculated seismic compression settlement to be less than approximately 1/3-inch.

The liquefaction and seismic settlement calculations for the borings and CPTs from our field investigation are provided in Appendix G.

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4.1.3 Tsunami Hazard

A tsunami is a giant sea wave usually generated by catastrophic displacement on a submarine fault. Tsunamis can travel at speeds of hundreds of miles per hour over distances of thousands of miles. In the open ocean, tsunamis have large wavelengths and are difficult to detect. As the sea wave approaches shore, the wave decreases in wavelength and increases in amplitude (height). Large tsunamis can travel well beyond the normal wave break of the shoreline and can cause damage to near-shore structures. Based on the "Tsunami Inundation Map for Emergency Planning, State of California, County of San Diego, Del Mar Quadrangle," prepared by the California Emergency Management Agency, dated June 1, 2009, the project site is located within a mapped tsunami inundation area. Therefore, we anticipate the potential for damage due to a tsunami is considered high for the site.

Furthermore, since the site is located within a half-mile of the Pacific Ocean and is situated below an elevation of +40 feet MSL, tsunami hazard should therefore be considered in the design phase of the project, including potential hydrostatic loads on bridges and retaining walls, in accordance with Caltrans' Memo to Designers 20-13 (Caltrans, 2010). Based on an information request submitted to Caltrans by the design team, we understand that the maximum design wave elevation is +10.7 feet NAVD88 with a maximum design flow velocity of 9.8 ft/s (3 m/s). We understand that these values consider sea level rise to year 2100 which is applicable for tsunami hazard. Although the roadway elevation is above this, this design tsunami wave should be considered for design of the project structures in accordance with Caltrans standards.

4.2 SEISMIC SHAKING AND PRELIMINARY SEISMIC DESIGN PARAMETERS

As discussed in Section 3.1.3, the project site is located in a seismically active region. The most significant seismic event likely to affect the project site would be an earthquake resulting from rupture along the offshore Rose Canyon fault, which is located approximately 2.2 miles west of the site.

Based on the results of our field investigation in which we performed a SCPT at the southern portion of the site, the average shear wave velocity in the upper 100 feet (30 meters) of the soil profile, deemed the V_{S30} value, is estimated to be approximately 710 ft/s. This V_{S30} value corresponds to a Soil Profile Type D based on Caltrans Seismic Design Criteria (SDC) V2.0 (Caltrans, 2019). Soil Profile Type D is defined as a stiff soil site with average shear wave velocities within the upper 100 feet of the soil profile between 600 and 1,200 ft/s, an average field

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standard penetration resistance between 15 and 50 bpf, or an average undrained shear strength between 1,000 and 2,000 psf.

However, as discussed in Section 4.1.2 of this report, there is a high liquefaction hazard at the site and; therefore, Caltrans SDC requires the site be classified as Soil Type F. As required by the SDC, a site response analysis must be performed for Soil Type F sites. Thus, we have performed a site response analysis based on the field investigations performed at the project site and the requirements set forth in Caltrans SDC and the results are provided in Appendix F.

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5 PRELIMINARY EVALUATIONS AND RECOMMENDATIONS

Geotechnical engineering discussion, conclusions, and preliminary recommendations for the type selection phase of the Camino Del Mar Bridge Replacement project are presented in the subsequent sections. These recommendations are consistent with the guidelines presented in Caltrans' Geotechnical Design Report Guidelines (Caltrans, 2020) and cover the preliminary geotechnical recommendations pertinent to the project components located greater than approximately 150 feet beyond the extents of the bridge structure. Preliminary foundations recommendations, as well as other discussions and recommendations pertaining to the geotechnical aspects of the bridge structure and associated approach retaining walls located within 150 feet from the bridge limits are provided in the PFR.

5.1 EMBANKMENT FILLS

Based on the project conceptual design plans and discussions with the project team, we understand that several approach fill profiles are currently under consideration at this phase of the project. Minimal grading is expected beyond 150 feet away from the bridge limits with proposed approach fill heights of less than 5 feet.

5.1.1 Embankment Settlement

Based on the conceptual grading profiles for the bridge approaches and the subsurface conditions at the site, we anticipate minimal static settlement due to the new approach fills. Furthermore, due to the granular soils within the zone of influence below the approach embankments, static settlements are anticipated to occur relatively quickly after construction activities with the majority of the elastic settlement occurring during placement and compaction of fills. Once the final grading profiles have been established, bridge approach settlements due to placement of new approach fills should be evaluated.

Liquefaction-induced settlements between 3 to 7 inches during a seismic event have been estimated along the approaches based on the results of the field investigation as discussed in Section 4.1.2 of this report. This should be considered a maintenance issue and should be included as an item for post-earthquakes inspection and repair.

5.1.2 Embankment Global Stability

Based on discussions with the project team and the conceptual plans, we understand that various grade profiles are currently under consideration and that final grades for the embankment slopes

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extending from the roadway to the beach areas along the embankments have not yet been determined. We anticipate the global stability of the proposed approach embankments outside of the bridge limits will be considered stable with the use of Caltrans Standard fill. However, analyses should be performed to confirm the global stability once the final roadway profile, slope grades, and fill thicknesses have been determined.

Approach fill heights are expected to be the highest at the abutments representing the critical section for global stability analysis. We have performed limit equilibrium slope stability analyses for the bridge abutment walls/slopes which are included in the PFR. These slope stability analyses evaluate the critical stability sections of the wall/approach fill system.

5.2 PAVEMENT

Based on conversations with the project team and review of preliminary plans, we understand the existing roadway pavement within approximately 300 feet of the Camino Del Mar Bridge will be demolished and replaced to facilitate proposed earthwork. We anticipate that the pavement for the approach embankments will consist of asphalt concrete (AC) pavement consistent with the current site conditions and a concrete approach slab is anticipated within approximately 30 feet approaching the bridge deck. Recommendations for the new AC pavement are provided herein.

We understand that the Camino Del Mar Replacement Bridge will primarily be used for vehicular, bicycle, and pedestrian traffic, with occasional truck traffic, although detailed vehicular load and frequency information was not provided.

Two resistance value (R-value) tests were performed on selected bulk samples of the near-surface soils from borings R-20-001 and R-20-002. The R-value test results are given in Appendix C and resulted in R-values of 51 and 63.

The recommended pavement sections provided herein are based on Caltrans Highway Design Manual and the following conditions:

1. A Minimum of 12 inches of existing subgrade soils should be overexcavated and replaced with new, compacted engineered fill. The new, compacted engineered fill should be placed at an optimum moisture content between optimum and 3 percent above optimum at a minimum relative compaction of 95 percent per ASTM D1557.
2. Utility trench backfill should be properly placed and adequately compacted to provide a stable subgrade. Trench backfill within the top 12 inches of pavement soil subgrade should be compacted to a minimum of 95 percent relative compaction (ASTM D1557).

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3. An adequate drainage system should be provided to prevent surface water from saturating the subgrade soil. Pavements should be sloped to provide positive drainage and water should not be allowed to pond.
4. A periodic maintenance program should be incorporated to include sealing cracks and other measures.
5. Aggregate base materials and the upper 12 inches of subgrade soil below the aggregate base should be compacted to a minimum of 95 percent of the ASTM D1557 maximum dry density.
6. The finished subgrade should be at, or brought to, a firm and unyielding condition at the time aggregate base is laid and compacted.
7. Concrete curbs separating pavement from landscaped areas extend below the bottom of adjacent aggregate base materials to reduce movement of moisture into the aggregate base layer.
8. Pavement subgrades are placed and compacted according to the project specifications.

5.2.1 Flexible Pavements

Based on our experience with similar projects, we anticipate traffic indices of 5.0 to 7.0 may be anticipated for the project. Based on the R-value test results, potential variability along the approximate 300-foot-long fill sections of the bridge approaches, and the recommendation for pavements to be supported on a minimum of 12 inches of new, engineered fill, we recommend an R-value of 30 may be used for preliminary pavement design. Final pavement sections may be adjusted based on testing of actual subgrade soils during construction.

Preliminary recommended flexible pavement sections using an R-value of 30 have been evaluated in accordance with Caltrans Standards and are provided in Table 1.

Table 1

Recommended Flexible Pavement Sections

Traffic Index	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
5	3	5½
	4	4
6	4	6½
	5	4½

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Table 1 (Continued)

Recommended Flexible Pavement Sections

Traffic Index	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
7	4½	8½
	5	7½

The flexible pavement and aggregate base materials should conform to and be placed in accordance with current Caltrans Standard Specifications. The aggregate base should be compacted to a minimum of 95 percent of the maximum dry density per ASTM D1557.

The above recommendations are contingent on supporting the pavements on a minimum of 12 inches of new, engineered fill. The upper 12 inches of existing fill material encountered within pavement subgrades should be removed. The aggregate base can be placed directly on the pavement subgrades provided it has been compacted to 95 percent of the ASTM D1557 maximum dry density at moisture contents of 0 to 3 percent above optimum.

5.3 CORROSION POTENTIAL

Preliminary laboratory corrosive soil screening of the on-site soils was performed on samples collected from borings R-20-001 and R-20-002 to evaluate the potential corrosion on concrete and ferrous metals. The results of the testing are presented in Table 2 and included in Appendix C. Furthermore, one laboratory corrosion test was performed on a near-surface sample from Ninyo & Moore boring B-8 performed at the southern end of the bridge. The results from this test are also provided in Table 2 as well as in Appendix E.

Table 2

Preliminary Corrosion Test Results

Boring	Depth (feet)	Minimum Resistivity (ohm-cm)	pH	Water Soluble Sulfates (ppm)	Water Soluble Chlorides (ppm)
R-20-001	0.5 - 5.5	12,000	9.0	42	21
R-20-001	51-51.5	190	9.0	600	2,460
R-20-002	0.5 - 4	13,000	8.7	45	21
R-20-002	126-126.5	85	8.0	870	7,480
B-8 (N&M)	5-6.5	10,000	8.4	40	50

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Caltrans Corrosion Guidelines (Caltrans, 2018) considers the subsurface conditions at a site to be aggressive to below-grade concrete if one or more of the following conditions exist for the representative soil samples taken at the site: chloride concentration is 500 parts per million (ppm) or greater, sulfate concentration is 1,500 ppm or greater, or the pH is 5.5 or less. Since resistivity serves as an indicator parameter for the possible presence of soluble salts, it is not included as a parameter to define a corrosive area for structures based on Caltrans Guidelines.

Based on the Caltrans criteria, the near-surface artificial fill soils are considered to be not aggressive to below-grade metals or concrete. However, the natural soils at depth below the groundwater table are considered to be aggressive to below-grade concrete due to the high soluble chloride concentration laboratory test results. Based on these test results and the proximity of the project site to salt water, buried metal and concrete elements should be designed for corrosive conditions in accordance with applicable sections of the AASHTO Bridge Design Specifications with California Amendments and Caltrans Memos to Designers and Standard Specifications.

Preliminary corrosion tests are only an indicator of potential soil aggressivity for the sample tested. We recommend that additional corrosion tests be performed at variable depths and on soil samples taken at additional investigative locations. Furthermore, due to the proximity of the site to the Pacific Ocean and the high groundwater table encountered at the site, we recommend corrosion of below-grade elements should consider corrosive groundwater conditions as well. Corrosion test results should be reviewed and evaluated by the project designers considering the proposed improvements and project lifespan requirements. Kleinfelder does not practice corrosion engineering and the purpose of our tests is only to provide a preliminary screening. A qualified corrosion engineer should be contacted for detailed evaluation of corrosion potential with respect to construction materials at this site and the proposed design.

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6 ADDITIONAL INVESTIGATION AND DESIGN EVALUATION

The recommendations provided in this preliminary geotechnical design report are based on the currently available preliminary plans, our available information review, geotechnical field investigation, and our understanding of the proposed project. We recommend that an additional geotechnical investigation be completed at the site once the final bridge type has been selected and the alignment design plans, profiles and cross-sections are developed. Depending on the location and height of fills, retaining walls, and any other improvements, additional explorations may or may not be required. Based on any additional explorations, our preliminary observations and recommendations should be updated, and final geotechnical recommendations should be prepared for the project. We recommend the additional geotechnical investigation should include the following:

- Additional exploratory borings and/or CPTs located at each proposed pier location. The additional explorations should be advanced deep enough to appropriately evaluate the subsurface conditions for purposes of foundation design based on the preliminary foundation recommendations provided in the PFR. It should be noted that a CPT was attempted at the central portion of the existing bridge and early refusal on gravel and cobbles was encountered. This, along with environmental and permitting restrictions, should be considered during the planning of future explorations within the river channel.
- Additional laboratory testing of collected soil samples to provide final geotechnical design parameters for proper embankment stability, settlement analyses, and pavement design.

Final geotechnical design analyses should be completed for the Camino Del Mar Bridge Replacement project in order to provide recommendations for the finalized bridge type and configuration. The analyses should be conducted to confirm our preliminary recommendations and provide updated recommendations in a final geotechnical design report including recommendations for pavement design and earthwork.

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7 LIMITATIONS

This report has been prepared for the exclusive use of the City of Del Mar and their consultants for specific application to the design and construction of the Camino Del Mar Bridge Replacement project. The findings, conclusions, and recommendations presented in this report were prepared in accordance with generally accepted geotechnical engineering practice. No warranty, express, or implied is made.

The scope of services was limited to the field exploration program described in this report. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies.

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining the level of service necessary to provide information for their project at an acceptable level of risk. The client and key members of the design team should discuss the issues addressed in this report with Kleinfelder so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk, and expectations for future performance and maintenance.

Conclusions and recommendations contained in this report are based on our field observations and subsurface explorations, laboratory tests, engineering analyses, and our understanding of the proposed construction. It is possible that soil or groundwater conditions could vary between or beyond the points explored. If soil or groundwater conditions are encountered during construction that differ from those described herein, then the client is responsible for ensuring that Kleinfelder is notified immediately so that we may re-evaluate the conclusions and recommendations of this report. If the scope of the proposed construction, or locations of the improvements, changes from that described in this report, the conclusions and recommendations contained in this report are not considered valid until the changes are reviewed and the conclusions of this report are modified or approved in writing by Kleinfelder.

Kleinfelder cannot be responsible for interpretation by others of this report or the conditions encountered in the field. Kleinfelder should be retained so that all geotechnical aspects of construction will be monitored on a full-time basis by a representative from Kleinfelder, including but not limited to site preparation, preparation of foundations, and placement of engineered fill. These services provide Kleinfelder the opportunity to observe the actual soil and groundwater

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conditions encountered during construction and to evaluate the applicability of the recommendations presented in this report to the site conditions. If Kleinfelder is not retained to provide these services, we will cease to be the engineer of record for this project and will assume no responsibility for any potential claim during or after construction on this project. If changed site conditions affect the recommendations presented herein, then Kleinfelder must also be retained to perform a supplemental evaluation and to issue a revision to our report.

This report, and any future addenda or reports regarding this site, may be made available to bidders to supply them with only the data contained in the report regarding subsurface conditions and laboratory test results at the point and time noted. Bidders may not rely on interpretations, opinions, recommendations, or conclusions contained in the report. Due to the limited nature of any subsurface study, the contractor may encounter conditions during construction which differ from those presented in this report. In such event, the contractor should promptly notify the owner so that Kleinfelder can be contacted to confirm those conditions. We recommend contingency funds be reserved for potential problems during earthwork and foundation construction.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance, but in no event later than one year from the date of the report. Land use, site conditions (both on and off site), or other factors may change over time and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

Our geotechnical scope of services for this subsurface exploration and preliminary geotechnical design report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances at this site. Kleinfelder will assume no responsibility or liability whatsoever for any claim, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site or from the discovery of such hazardous materials. Additional important information about this report is presented in the attached Geotechnical Business Council insert in Appendix H.

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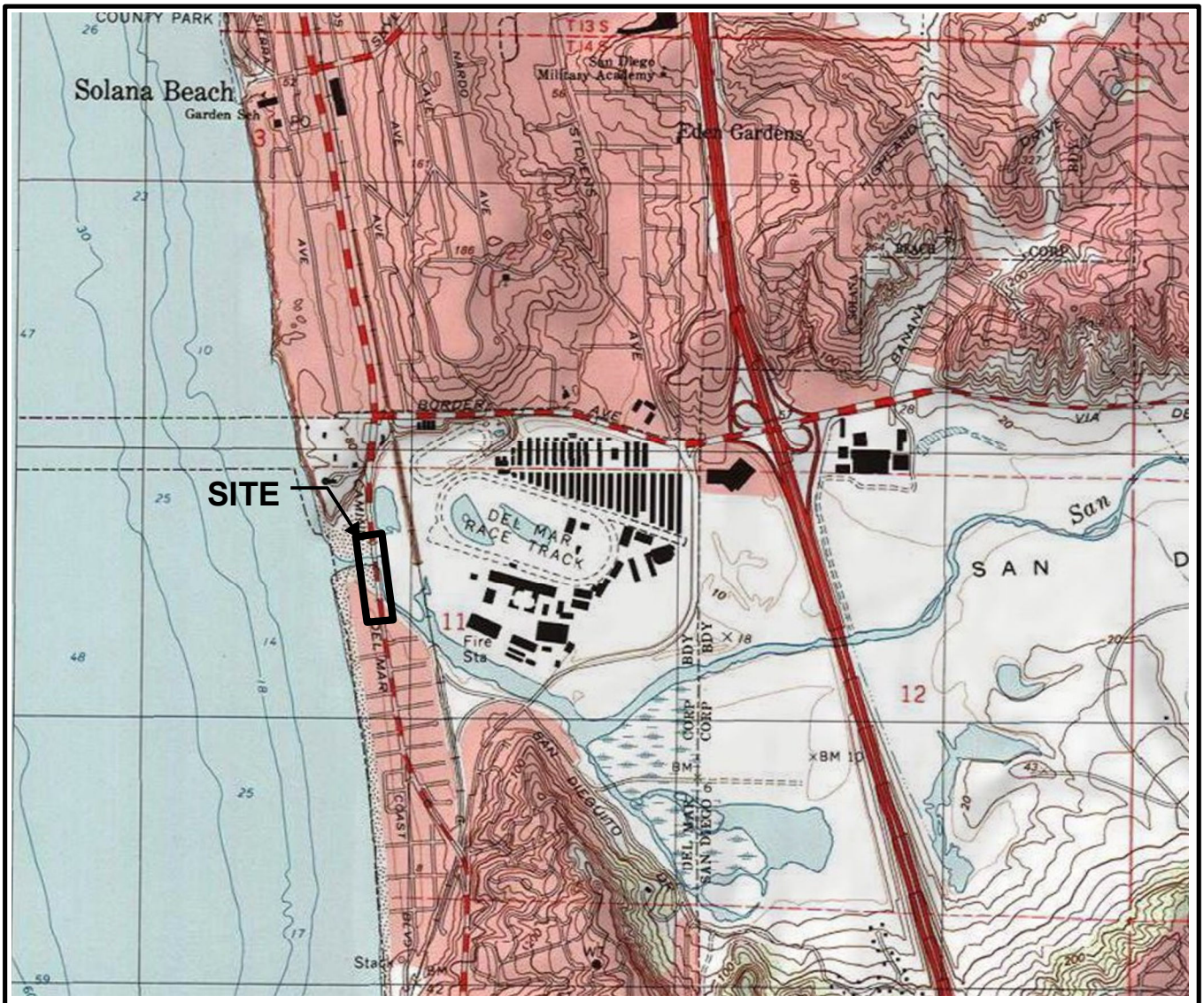
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FIGURES

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DRAWN BY:	JB
CHECKED BY:	KR
FILE NAME:	Figure 1_Vicinity Map.mxd

SITE VICINITY MAP

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
1

\\sandiego\swe-data\G\Bridge Division\Job Files\03 FY2018\0876 - Camino Del Mar Bridge Replacement\Phase B- PAED\Geotech\Deliverables\Figures\Figure 1_Vicinity Map.mxd



CPT-20-001

R-20-001

A

EXISTING CAMINO DEL MAR BRIDGE

CITY OF DEL MAR ROW

12" GAS LINE HANGING FROM BRIDGE

5" WRAPPED PIPE HANGING FROM BRIDGE

CPT-20-002/2A

R-20-002

CPT-20-003

A'

NOTES:

1. EXISTING CONDITIONS REFERENCED FROM THE TOPOGRAPHIC SURVEY PREPARED BY SAMPO ENGINEERING, INC. DATED APRIL 13, 2018.

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SCALE: 1" = 100'

100 50 0 100 200

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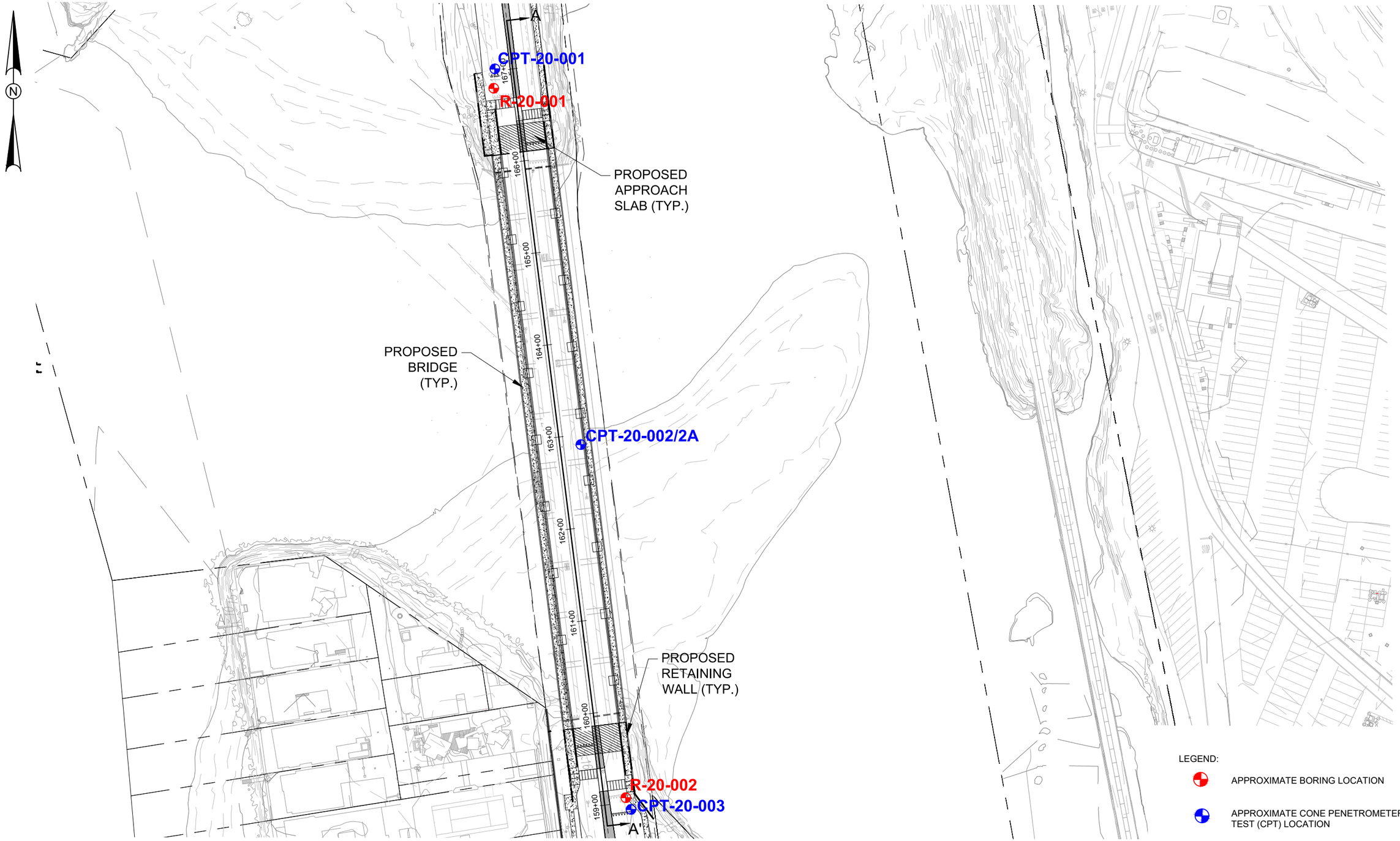
SITE AND PHASE 0 EXPLORATION LOCATION PLAN

CAMINO DEL MAR BRIDGE REPLACEMENT OVER SAN DIEGUITO RIVER - PHASE 0 DEL MAR, CALIFORNIA

FIGURE 2

PLOTTED: 4/7/2020 12:15 PM BY: janna bonfiglio
CAD FILE: C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Resources For Section\Del Mar Bridge TOPO.dwg LAYOUT: Layout1 (2)

PLOTTED: 5/28/2020 5:56 PM BY: janna.bonfiglio
CAD FILE: C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Camino Del Mar Bridge Plan - Profile - Standard 05192020\Camino Del Mar Bridge Plan - Profile.dwg LAYOUT: Layout1



NOTES:
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2. PROPOSED CONDITIONS REFERENCED FROM THE SITE PLAN PREPARED BY KLEINFELDER, INC. DATED MAY 19, 2020.

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100 50 0 100 200

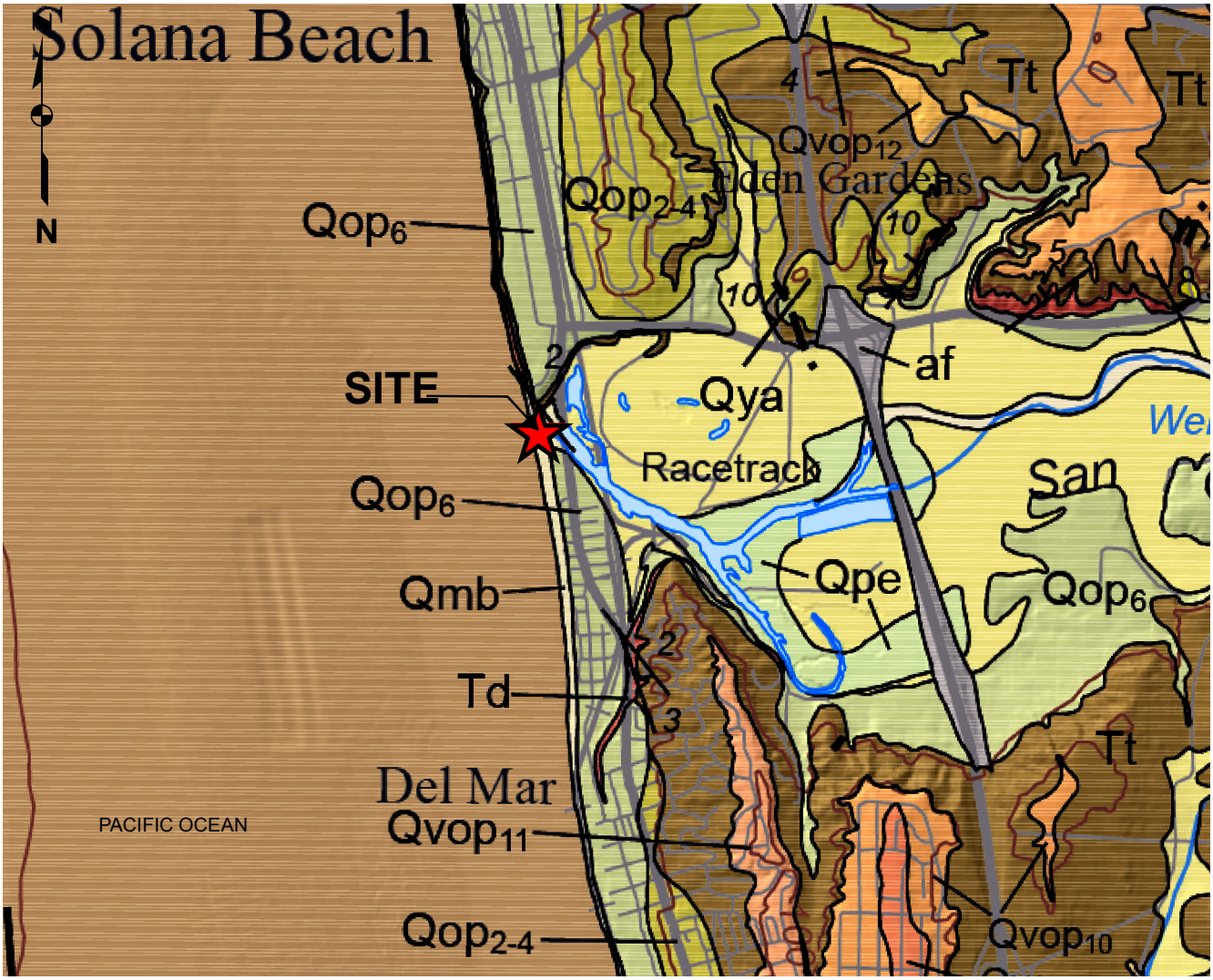
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REVISED:	-

PROPOSED CONDITIONS AND PHASE 0 EXPLORATION LOCATION PLAN

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
3



LEGEND

- af - ARTIFICIAL FILL
- Qmb - MARINE BEACH DEPOSITS
- Qya - YOUNG ALLUVIAL FLOOD-PLAIN DEPOSITS
- Qop_6 - OLD PARALIC DEPOSITS, UNDIVIDED, UNIT 6
- Qop_{2-4} - OLD PARALIC DEPOSITS, UNDIVIDED, UNITS 2-4
- Qop_{11} - OLD PARALIC DEPOSITS, UNDIVIDED, UNIT 11
- Qop_{10} - OLD PARALIC DEPOSITS, UNDIVIDED, UNIT 10
- Qop_{10a} - OLD PARALIC DEPOSITS, UNDIVIDED, UNIT 10a
- Qop_{12} - OLD PARALIC DEPOSITS, UNDIVIDED, UNIT 12
- Td - DELMAR FORMATION
- Tt - TORREY SANDSTONE

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0 1,000 2,000 4,000 6,000 Feet

SOURCE:
GEOLOGIC MAP OF THE SAN DIEGO 30' X 60' QUADRANGLE, CALIFORNIA, BY KENNEDY AND TAN, 2008.

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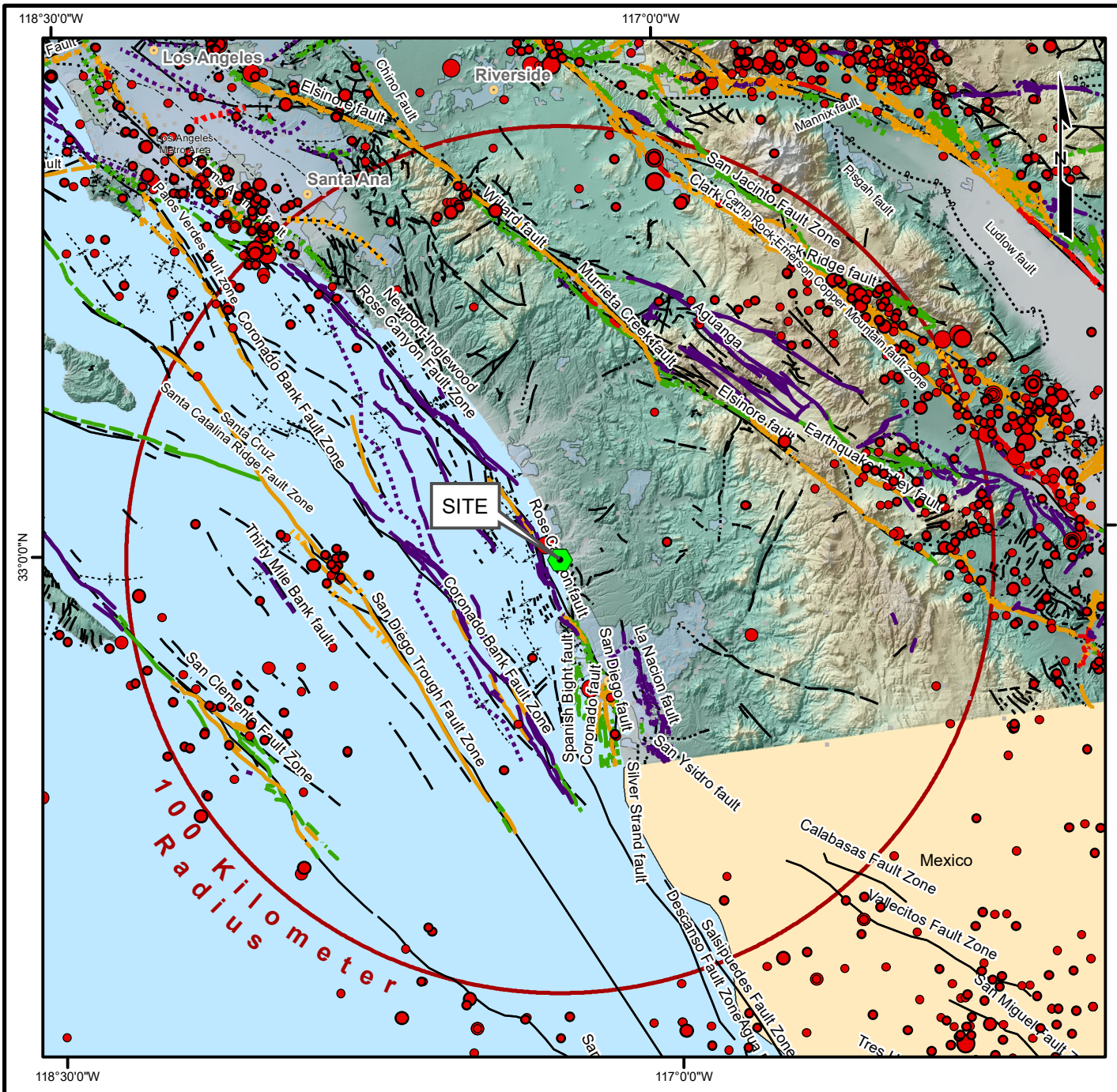
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FILE NAME:	Geo Map.mxd

REGIONAL GEOLOGIC MAP

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
4

\\sandiego\swe-data\G\Bridge Division\Job Files\03 FY2018\0876 - Camino Del Mar Bridge Replacement\Phase B- PAED\Geotech\Deliverables\Figures\Figure 3_Geo Map.mxd



Faulting Legend

Quaternary Faults (Bryant, 2005; USGS, 2018)

Historic displacement (< 150 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Late Quaternary displacement (< 750,000 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Holocene displacement (< 15,000 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Quaternary & unspecified displacement (< 1,600,000 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Pre-Quaternary Geologic Structures (CGS, 2000)
- fault, approx. located
- fault, approx. located, queried
- fault, certain
- fault, concealed
- fault, concealed, queried
- fault, inferred, queried

ANSS Earthquakes

Magnitude
- 4.0 - 4.9
- 5.0 - 5.9
- 6.0 - 6.9
- 7.0 - 7.9
- 8.0 - 8.9

35 17.5 0 35 Kilometers

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REGIONAL FAULT MAP AND EARTHQUAKE EPICENTERS (1800 - JULY 2019)

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
5

\\sandiegolswe-data\G\Bridge Division\Job Files\03 FY20180876 - Camino Del Mar Bridge Replacement\Phase B- PAED\Geotech\Deliverables\Figures\Figure 4_EQ Map.mxd

PLOTTED: 6/1/2020 9:25 AM BY: janet patay
CAD FILE: \\sandiego\sandiego-data\GRAPHICS\..clients\CityOfDelMar\20180876\dwg\Del Mar Bridge TOPO.dwg LAYOUT: Layout1 (2)

NORTH

NORTH

SOUTH

APPROXIMATE EXTENTS OF PROPOSED BRIDGE

EXISTING GROUND SURFACE

CPT-20-001 (PROJECTED 18' WEST)

R-20-001 (PROJECTED 21' WEST)

PROPOSED BRIDGE PROFILE

CPT-20-002/2A (PROJECTED 23' EAST)

R-20-002 (PROJECTED 22' EAST)

CPT-20-003 PROJECTED 26' EAST)

ELEVATION (FEET, NAVD88)

af

ABUTMENT 7

PIER 6

PIER 5

PIER 4

PIER 3

PIER 2

ABUTMENT 1

Qa

Qya

Qyes

Qoa

Td

TD=151.0'

TD=208.0'

GEOLOGIC CROSS SECTION STATIONING

BRIDGE STATIONING

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00

167+00 166+00 165+00 164+00 163+00 162+00 161+00 160+00 159+00

LEGEND

- ARTIFICIAL FILL
- RECENT ALLUVIAL DEPOSITS
- YOUNG ALLUVIAL DEPOSITS
- YOUNG ESTAURINE DEPOSITS
- OLD ALLUVIAL DEPOSITS
- **Td** DEL MAR FORMATION
- APPROXIMATE GEOLOGIC CONTACT, QUERIED WHERE UNCERTAIN

CPT-20-003 (PROJECTED 28' EAST)

CPT LOCATION WITH TIP RESISTANCE (RIGHT SIDE) AND FRICTION RESISTANCE (LEFT SIDE) PROFILES, SHOWING PROJECTION AND TOTAL CPT DEPTH

R-20-002 (PROJECTED 22' EAST)

5,4,7
5,5,5
3,3,1

TD = 208.3'

BORING LOCATION WITH GRAPHIC LOG AND N-VALUES, SHOWING PROJECTION AND TOTAL BORING DEPTH (N = Blows/Foot for bot□Cal and SPT samples - see Boring logs in report for sample types and description of grap□ic symbols)

REFER TO FIGURES A-1 AND A-2 IN APPENDIX A FOR FURTHER EXPLANATION OF BORING LOGS

GROUNDWATER LEVEL DURING DRILLING

GROUNDWATER LEVEL AFTER DRILLING

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60 30 0 60
SCALE (FEET)

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GEOLOGIC CROSS-SECTION A-A'

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
6

APPENDIX A
BOREHOLE LOGS

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APPENDIX A

BOREHOLE LOGS

The geotechnical borehole explorations for the project consisted of drilling and logging two borings, designated as R-20-001 and R-20-002, advanced by Pacific Drilling of San Diego, California. The borings were drilled using a truck-mounted drill rig between February 10th and 21st, 2020. The borings were advanced to depths of approximately 151 and 208 feet below ground surface, respectively, using 8-inch outer-diameter hollow-stem augers and a 4-inch-diameter tri-cone roller bit with the rotary wash method. The approximate locations of the boreholes are presented in Figures 2 and 3.

A Unified Soil Classification System (USCS) chart, graphics key, and borehole log legend are presented in Appendix A in addition to the borehole logs. The borehole logs describe the earth materials encountered, samples obtained, and show results of field and select laboratory tests. The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

The boreholes were logged by our field engineer who collected bulk and intact samples of encountered materials for further evaluation and laboratory testing. In-place soil samples were obtained at the test boring locations using a Standard Penetration Test (SPT) or California-type Samplers driven a total of 18 inches (or until practical refusal) into the undisturbed soil at the bottom of the borehole. The soil sampled by the SPT (2-inch outer diameter) or California-type sampler (3-inch outer diameter) was returned to our laboratory for testing. The samplers and associated rods were driven using a 140-pound automatic hammer falling a distance of 30 inches. The number of hammer blows to drive the samplers every 6 inches is recorded on the boring logs. The total number of hammer blows required to drive the sampler the final 12 inches is termed the blow count (or N-value). The blow count values are the field values and have not been corrected for effects such as overburden pressure, sampler size, sample depth, hammer efficiency, etc. on the boring logs.

Prior to drilling of the borings, a utility mark-out was performed by Southwest Geophysics using various geophysical survey equipment. Additionally, prior to the start of drilling, the surficial pavement was cored by Cut N Core and the first 5 to 6 feet of each borehole was advanced via a manual hand auger to further clear for utilities. Upon completion, the boreholes were backfilled with bentonite and patched at the surface with asphalt concrete. Soil cuttings were stored in 55-gallon steel drums and were disposed of offsite.

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GROUP SYMBOLS AND NAMES

Graphic / Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic / Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY elastic ELASTIC SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435-04)
CL	Collapse Potential (ASTM D 5333-03)
CP	Compaction Curve (CTM 216 - 06)
CR	Corrosion, Sulfates, Chlorides (CTM 643 - 99; CTM 417 - 06; CTM 422 - 06)
CU	Consolidated Undrained Triaxial (ASTM D 4767-02)
DS	Direct Shear (ASTM D 3080-04)
EI	Expansion Index (ASTM D 4829-03)
M	Moisture Content (ASTM D 2216-05)
OC	Organic Content (ASTM D 2974-07)
P	Permeability (CTM 220 - 05)
PA	Particle Size Analysis (ASTM D 422-63 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89-02, AASHTO T 90-00)
PL	Point Load Index (ASTM D 5731-05)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301 - 00)
SE	Sand Equivalent (CTM 217 - 99)
SG	Specific Gravity (AASHTO T 100-06)
SL	Shrinkage Limit (ASTM D 427-04)
SW	Swell Potential (ASTM D 4546-03)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166-06) Unconfined Compression - Rock (ASTM D 2938-95)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850-03)
UW	Unit Weight (ASTM D 4767-04)
VS	Vane Shear (AASHTO T 223-96 [2004])

SAMPLER GRAPHIC SYMBOLS

- Standard Penetration Test (SPT)
- Standard California Sampler
- Modified California Sampler
- Shelby Tube
- Piston Sampler
- NX Rock Core
- HQ Rock Core
- Bulk Sample
- Other (see remarks)

DRILLING METHOD SYMBOLS

- Auger Drilling
- Rotary Drilling
- Dynamic Cone or Hand Driven
- Diamond Core

WATER LEVEL SYMBOLS

- First Water Level Reading (during drilling)
- Static Water Level Reading (short-term)
- Static Water Level Reading (long-term)

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REPORT TITLE
BORING RECORD LEGEND

DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**

PROJECT OR BRIDGE NAME
Camino Del Mar Bridge Replacement

BRIDGE NUMBER	PREPARED BY	DATE	SHEET
NA	**ST**	**2-26-20**	**1 of 3**

gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BR KEY P1_SOIL]
PROJECT NUMBER: 20180876.001A

CONSISTENCY OF COHESIVE SOILS				
Descriptor	**Unconfined Compressive Strength (tsf)**	**Pocket Penetrometer (tsf)**	**Torvane (tsf)**	**Field Approximation**
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	0.25 - 0.50	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	0.50 - 1.0	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	1.0 - 2.0	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	2.0 - 4.0	1.0 - 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS	
Descriptor	**SPT N_{60} - Value (blows / foot)**
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE	
Descriptor	**Criteria**
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS	
Descriptor	**Criteria**
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE		
Descriptor		**Size**
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS	
Descriptor	**Criteria**
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION	
Descriptor	**Criteria**
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

NOTE: This legend sheet provides descriptors and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

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REPORT TITLE
BORING RECORD LEGEND

DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**

PROJECT OR BRIDGE NAME
Camino Del Mar Bridge Replacement

BRIDGE NUMBER	PREPARED BY	DATE	SHEET
NA	**ST**	**2-26-20**	**2 of 3**

gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BR KEY P2_SOIL]
PROJECT NUMBER: 20180876.001A

ROCK GRAPHIC SYMBOLS


IGNEOUS ROCK


SEDIMENTARY ROCK


METAMORPHIC ROCK

BEDDING SPACING

Descriptor	Thickness or Spacing
Massive	> 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8 inches to 1 ft
Thinly bedded	1-1/4 to 3-5/8 inches
Very thinly bedded	3/8 inch to 1-1/4 inches
Laminated	< 3/8 inch

WEATHERING DESCRIPTORS FOR INTACT ROCK

	Diagnostic Features					
	Chemical Weathering-Discoloration-Oxidation		Mechanical Weathering and Grain Boundary Conditions	Texture and Solutioning		
Descriptor	Body of Rock	Fracture Surfaces		Texture	Solutioning	General Characteristics
Fresh	No discoloration, not oxidized	No discoloration or oxidation	No separation, intact (tight)	No change	No solutioning	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull	Minor to complete discoloration or oxidation of most surfaces	No visible separation, intact (tight)	Preserved	Minor leaching of some soluble minerals may be noted	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty"; feldspar crystals are "cloudy"	All fracture surfaces are discolored or oxidized	Partial separation of boundaries visible	Generally preserved	Soluble minerals may be mostly leached	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in situ disaggregation (refer to grain boundary conditions)	All fracture surfaces are discolored or oxidized; surfaces are friable	Partial separation, rock is friable; in semi-arid conditions, granitics are disaggregated	Altered by chemical disintegration such as via hydration or argillation	Leaching of soluble minerals may be complete	Dull sound when struck with hammer; usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures or veinlets. Rock is significantly weakened.
Decomposed	Discolored of oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay		Complete separation of grain boundaries (disaggregated)	Resembles a soil; partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes".

Note: Combination descriptors (such as "slightly weathered to fresh") are used where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant identifiable zones can be delineated. Only two adjacent descriptors shall be combined. "Very intensely weathered" is the combination descriptor for "decomposed to intensely weathered".

RELATIVE STRENGTH OF INTACT ROCK

Descriptor	Uniaxial Compressive Strength (psi)
Extremely Strong	> 30,000
Very Strong	14,500 - 30,000
Strong	7,000 - 14,500
Medium Strong	3,500 - 7,000
Weak	700 - 3,500
Very Weak	150 - 700
Extremely Weak	< 150

ROCK HARDNESS

Descriptor	Criteria
Extremely Hard	Specimen cannot be scratched with pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows
Very hard	Specimen cannot be scratched with pocket knife or sharp pick; breaks with repeated heavy hammer blows
Hard	Specimen can be scratched with pocket knife or sharp pick with heavy pressure; heavy hammer blows required to break specimen
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure; breaks with moderate hammer blows
Moderately Soft	Specimen can be grooved 1/6 in. with pocket knife or sharp pick with moderate or heavy pressure; breaks with light hammer blow or heavy hand pressure
Soft	Specimen can be grooved or gouged with pocket knife or sharp pick with light pressure, breaks with light to moderate hand pressure
Very Soft	Specimen can be readily indented, grooved, or gouged with fingernail, or carved with pocket knife; breaks with light hand pressure

CORE RECOVERY CALCULATION (%)

$$\frac{\Sigma \text{ Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100$$

RQD CALCULATION (%)

$$\frac{\Sigma \text{ Length of intact core pieces > 4 in.}}{\text{Total length of core run (in.)}} \times 100$$

FRACTURE DENSITY

Descriptor	Criteria
Unfractured	No fractures
Very Slightly Fractured	Lengths greater 3 ft
Slightly Fractured	Lengths from 1 to 3 ft, few lengths outside that range
Moderately Fractured	Lengths mostly in range of 4 in. to 1 ft, with most lengths about 8 in.
Intensely Fractured	Lengths average from 1 in. to 4 in. with scattered fragmented intervals with lengths less than 4 in.
Very Intensely Fractured	Mostly chips and fragments with few scattered short core lengths

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REPORT TITLE
BORING RECORD LEGEND

DIST.	COUNTY	ROUTE	POSTMILE	EA
11	San Diego	NA	NA	NA

PROJECT OR BRIDGE NAME
Camino Del Mar Bridge Replacement

BRIDGE NUMBER	PREPARED BY	DATE	SHEET
NA	ST	2-26-20	3 of 3

gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BR KEY P3_ROCK]
PROJECT NUMBER: 20180876.001A

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
S.Tena	2-18-20	2-21-20	32.97607° / -117.26928° WGS84	R-20-001
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Pacific Drilling			Sta N/A	~16.00 ft NAVD88
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Mud Rotary			Marl 10	8 in / 4 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
SPT (1.4"), CAL (2.5")			Auto; 140 lbs / 30-inch drop	94%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS DURING DRILLING	AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING
Bentonite and grout			14.0 ft	17.0 ft on 2-21-20	151.0 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		ASPHALT CONCRETE; (5").												
15.0			POORLY GRADED SAND with SILT (SP-SM); yellowish red (5YR 5/6); moist; mostly medium to fine SAND; little fines; non-plastic (ARTIFICIAL FILL (af)).		S1					3					M, PA, R, CR
	5		- yellow (10YR 7/6) and dark yellowish brown (10YR 4/4); coarse to fine SAND.												
10.0			- medium dense; strong brown (7.5YR 4/6); medium to fine SAND.		S2	12 13 13	26	94							
					S3	5 10 11	21	83		5					M, PA
	10		POORLY GRADED SAND with SILT (SP-SM); medium dense; light brownish gray (2.5Y 6/1); moist; mostly fine SAND; little fines; non-plastic (RECENT ALLUVIAL DEPOSITS (Qa)).		S4	8 8 11	19	77							
5.0			- gray (2.5Y 5/1); medium to fine SAND; increase in moisture content.		S5	6 7 9	16	72		14					M, PA, PI
			- wet.		S6	7 11 14	25	89		25					M
0.0	15		POORLY GRADED SAND (SP); medium dense; gray (2.5Y 5/1); wet; medium to fine SAND; non-plastic; micaceous.		S7	6 8 9	17	89		27					M, PA
			POORLY GRADED SAND with SILT (SP-SM); medium dense; dark gray (2.5Y 4/1); wet; medium to fine SAND; little fines; non-plastic.		S8	3 7 5	12	77		26					Added water at 18 feet. M
-5.0	20		- loose; few coarse subrounded GRAVEL, 2 in. max. dia..		S9	1 3 3	6	39							Switch to mud rotary drilling from hollow stem auger at 20 feet. PA
	25														

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REPORT TITLE				HOLE ID
BORING RECORD				R-20-001
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	San Diego	NA	NA	NA
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	ST		2-26-20	1 of 6

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PROJECT NUMBER: 20180876.001A OFFICE FILTER: SAN DIEGO
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ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	25		SILTY SAND (SM); medium dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines.		S10	7 7 6	13	72						
-10.0			LEAN CLAY (CL); very soft; dark gray (2.5Y 4/1); wet; few fine SAND; mostly fines; medium plasticity.											
	30				S11	2 4 3	7	33		55	66	PP=0.0		M, UW, PI
-15.0			SILTY SAND (SM); loose; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; trace shell fragments.											Rocky from 33 to 34 feet.
	35		FAT CLAY (CH); very soft; dark gray (2.5Y 4/1); wet; few medium SAND; mostly fines; medium to high plasticity; trace roots and shell fragments.		S12	4 4 4	8	55				PP=0.0		PA, PI
-20.0			SILTY SAND with GRAVEL (SM); wet; (inferred from drilling action).											Hard drilling due to gravel layers.
	40		- subrounded gravel (3") inside sampler.			17 18 34	52	NR						Rocky from 40 to 50 feet due to gravel layers. No sample recovery at 40 to 41.5 feet.
-25.0														
	45					14 15 16	31	NR						No sample recovery at 45 to 46.5 feet.
-30.0			SILTY SAND (SM); dense; dark gray (2.5Y 4/1); wet; mostly coarse to fine SAND; little fines; non-plastic; trace shell fragments (YOUNG ALLUVIAL DEPOSITS (Qya)).											
	50				S13	17 20 20	40	44		21	110			M, UW, PA
-35.0														
	55													

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-001**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-26-20**	**2 of 6**

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PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	55		SILTY SAND (SM); dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic.		S14	15 20 21	41	77						
-40.0														
	60		- very dense; micaceous.		S15	17 26 40	66	55		25	102			M, UW, PA, PI
-45.0														
	65		- loose.		S16	11 5 3	8	55				PP=0.0		
-50.0			SANDY LEAN CLAY (CL); very soft; dark gray (2.5Y 4/1); wet; some fine SAND; mostly fines; low to medium plasticity.											
			POORLY GRADED SAND with SILT (SP-SM); very dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; trace shell fragments.											
	70				S17	11 20 31	51	66		21	108			M, UW, PA
-55.0														
	75		- dense.		S18	21 23 20	43	77						PI
-60.0														
	80		- very dense.		S19	29 40 31	71	66		21	107			M, UW, PA
-65.0														
	85													

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-001**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-26-20**	**3 of 6**

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ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		SILTY SAND (SM); medium dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic (YOUNG ESTUARINE DEPOSITS (Qyes)).		S20	13 11 10	21	72							
-70.0			LEAN CLAY (CL); medium stiff; black (10YR 2/1); wet; few fine SAND; mostly fines; medium plasticity; micaceous, trace shell fragments.												
	90				S21	4 5 7	12	66		47	77	PP=0.5			M, UW, PI, WA
-75.0															
	95		SILTY SAND (SM); medium dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; some fines; non-plastic (OLD ALLUVIAL DEPOSITS (Qoa)).		S22	4 6 14	20	100							
-80.0															
	100		- dense.		S23	7 13 22	35	66							DS
-85.0															
	105		POORLY GRADED SAND with SILT (SP-SM); medium dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; micaceous.		S24	5 10 16	26	89							
-90.0															
	110		- SAA.		S25	12 11 13	24	66		32	92				M, UW, PA
-95.0															
	115														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-001**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-26-20**	**4 of 6**

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PROJECT NUMBER: 20180876.001A OFFICE FILTER: SAN DIEGO
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ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	115		SILTY SAND (SM); dense; dark gray (10YR 4/1); mostly medium to fine SAND; little fines; non-plastic.		S26	10 17 16	33	100						
-100.0														
	120		- very dense.		S27	14 24 33	57	33		25	103			M, UW, PA
-105.0														
	125		- SAA.		S28	12 24 31	55	89						
-110.0														
	130		- SAA.		S29	14 24 29	53	66						
-115.0														DS Increase in drilling effort at 132 feet.
	135													
-120.0														
	140		- dense.		S30	21 19 17	36	100						
-125.0														
	145													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-001**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-26-20**	**5 of 6**

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ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	145		SILTY SAND (SM); dense; dark gray (10YR 4/1); mostly medium to fine SAND; little fines; non-plastic.												
-130.0			CLAYSTONE; dark reddish brown (2.5YR 3/4) with grayish green (GLEY 1-5/5GY); medium plasticity (DEL MAR FORMATION (Td)).												Hard drilling at 146 feet.
	150			X	S31	30 50/5"	50/5	100				PP=4.5			PA, PI
-135.0			Bottom of borehole at 151.0 ft bgs												
-140.0	155														
-145.0	160														
-150.0	165														
-155.0	170														
	175														

KLEINFELDER
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REPORT TITLE **BORING RECORD**				HOLE ID **R-20-001**
DIST. **11**	COUNTY **San Diego**	ROUTE **NA**	POSTMILE **NA**	EA **NA**
PROJECT OR BRIDGE NAME **Camino Del Mar Bridge Replacement**				
BRIDGE NUMBER **NA**	PREPARED BY **ST**		DATE **2-26-20**	SHEET **6 of 6**

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PROJECT NUMBER: 20180876.001A
OFFICE FILTER: SAN DIEGO

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
S.Tena	2-10-20	2-13-20	32.97396° / -117.26878° WGS84	R-20-002
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Pacific Drilling			Sta N/A	~16.00 ft NAVD88
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Mud Rotary			Marl 10	8 in / 4 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
SPT (1.4"), CAL (2.5")			Auto; 140 lbs / 30-inch drop	94%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS DURING DRILLING 11.0 ft / AFTER DRILLING (DATE) Not Applicable	TOTAL DEPTH OF BORING
Bentonite and grout				208.0 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		ASPHALT CONCRETE; (6").												
15.0			POORLY GRADED SAND (SP); light brownish gray (10YR 6/2); moist; trace subrounded GRAVEL, 2 in. max. dia.; mostly medium to fine SAND; non-plastic; micaceous (ARTIFICIAL FILL (af)).		S1					4					M, PA, R, CR
	5														
10.0			POORLY GRADED SAND with SILT (SP-SM); medium dense; light brownish gray (10YR 6/2); moist; mostly medium to fine SAND; little fines; non-plastic.		S2	5 4 7	11	100							
			- loose; trace shell fragments.		S3	5 5 5	10	66		4					M, PA, PI
			POORLY GRADED SAND with SILT (SP-SM); very loose; brown (10YR 5/3); moist; mostly medium to fine SAND; little fines; non-plastic; micaceous (RECENT ALLUVIAL DEPOSITS (Qa)).		S4	3 3 1	4	55							
5.0	10		- dark grayish brown (10YR 4/2); moist to wet.		S5	2 1 1	2	55		21					M, PA
			- very dark gray (10YR 3/1); wet; some fines; non-plastic to low plasticity; trace of odor.		S6	1 2 2	4	44							
0.0	15		POORLY GRADED SAND (SP); loose; dark gray (10YR 4/1); wet; mostly medium to fine SAND; non-plastic; trace shell fragments, no odor, micaceous. -gravelly layers from 16 to 18 feet.		S7	2 1 4	5	77		27					Added water at 15 feet. M, PA
			- medium dense.		S8	8 9 9	18	77		27					Switch to mud rotary drilling from hollow stem auger at 16.5 feet. M
	20					1 4 8	12	NR							No sample recovery at 19 to 20.5 feet.
-5.0			SILTY SAND (SM); loose; dark gray (10YR 4/1); wet; mostly medium to fine SAND; some fines; non-plastic; trace shell fragments.		S9	6 3 2	5	55							PA, PI
	25														

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REPORT TITLE				HOLE ID
BORING RECORD				R-20-002
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	San Diego	NA	NA	NA
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	ST		2-14-20	1 of 8

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
PROJECT NUMBER: 20180876.001A OFFICE FILTER: SAN DIEGO
gINT FILE: Klf_gint_master_2018 gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	25		SILTY SAND (SM); dense; dark gray (10YR 4/1); trace subrounded GRAVEL, 3 in. max. dia.; mostly medium to fine SAND; some fines; non-plastic.		S10	12 17 17	34	33		26	100			M, UW
-10.0														
	30		POORLY GRADED SAND with SILT (SP-SM); dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; little fines; non-plastic (YOUNG ALLUVIAL DEPOSITS (Qya)).		S11	14 18 16	34	77						PA
-15.0														
	35		- SAA.		S12	17 21 20	41	55		24	101			M, UW
-20.0														
	40		SILTY SAND (SM); medium dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; some fines; non-plastic; increase in SILT content.		S13	6 9 5	14	77						PA
-25.0														
	45		- very dense; trace GRAVEL, 3 in. max. dia.; medium SAND; little fines.		S14	22 37 44	81	66		24	105			M, UW
-30.0														
	50		POORLY GRADED SAND (SP); medium dense; dark gray; wet; mostly medium to fine SAND; non-plastic; trace shell fragments.		S15	11 14 15	29	100						PA, PI
-35.0														
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**2 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	55		POORLY GRADED SAND with SILT (SP-SM); very dense; dark gray (10YR 4/1); mostly medium SAND; little fines; non-plastic.		S16	16 34 39	73	66		37	92			M, UW
-40.0														
	60		- medium dense.		S17	10 9 12	21	77						PA
-45.0														
	65		- very dense.		S18	24 30 26	56	66		29	96			M, UW
-50.0														
	70		- medium dense.		S19	19 15 14	29	77						PA
-55.0														
	75		- very dense.		S20	14 24 31	55	66		30	96			M, UW
-60.0														
			SILTY SAND (SM); loose; dark gray (10YR 4/1); wet; mostly fine SAND; some fines; non-plastic to low plasticity; micaceous, trace shell fragments (YOUNG ESTUARINE DEPOSITS (Qyes)).											
	80				S21	5 3 5	8	100				PP=0.5		PA, PI
-65.0														
	85													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**3 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	85		SANDY SILT (ML); medium stiff; dark gray (10YR 4/1); wet; some fine SAND; mostly fines; non-plastic to low plasticity.		S22	8 11 16	27	100		48	74	PP=0.5		Hole caved to 20 feet bgs on 2/11/2020 prior to start of drilling activities. M, UW
-70.0														
			LEAN CLAY (CL); medium stiff; dark gray (10YR 4/1); wet; few fine SAND; mostly fines; low plasticity; micaceous, trace shell fragments.											
	90				S23	3 4 5	9	100				PP=0.5		PA
-75.0														
			SILTY SAND (SM); dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic; micaceous, trace shell fragments (OLD ALLUVIAL DEPOSITS (Qoa)).											
	95				S24	10 18 30	48	66		28	95			M, UW, UC
-80.0														
	100		- medium dense; some fines; non-plastic to low plasticity; interbeded layer (1") of Silty Clay material.		S25	7 10 9	19	100						PA
-85.0														
	105		- dense; little fines; non-plastic.		S26	20 25 17	42	33						DS
-90.0														
	110		- medium dense.		S27	12 13 11	24	83						PA, PI
-95.0														
	115													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**4 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
PROJECT NUMBER: 20180876.001A OFFICE FILTER: SAN DIEGO
gINT FILE: Klf_gint_master_2018 gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	115		SILTY SAND (SM); dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic.		S28	12 24 26	50	66		29	104				M, UW
-100.0															
	120		- medium dense; coarse to medium SAND.		S29	13 14 13	27	77							
-105.0															
	125		- very dense.		S30	15 23 31	54	44		31	94				Hole caved to 115 feet bgs on 2/12/2020 prior to start of drilling activities. M, UW, PA
-110.0															
	130		- medium dense.		S31	8 9 12	21	89							
-115.0															
	135		- very dense.		S32	32 37 27	64	44							
-120.0															DS
	140		- loose; some medium to fine SAND; some fines; non-plastic to low plasticity; micaceous, increase in SILT content.		S33	5 2 8	10	94				PP=0.5			PA, PI
-125.0															
	145														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**5 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	145		SILTY SAND (SM); very dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic.		S34	23 29 30	59	44		29	92				M, UW
-130.0	150		POORLY GRADED SAND with SILT (SP-SM); dense; very dark gray; wet; mostly medium to fine SAND; little fines; non-plastic.		S35	15 16 17	33	77							PA
-135.0	155														
-140.0	160		- very dense; coarse to medium SAND.		S36	25 37 38	75	44							DS
-145.0	165														
-150.0	170		SILTY SAND (SM); medium dense; very dark gray; wet; some fines; non-plastic to low plasticity.		S37	4 7 9	16	100							PA
-155.0	175														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**6 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	175		SILTY SAND (SM); medium dense; very dark gray (10YR 3/1); wet; mostly coarse to medium SAND; some fines; non-plastic to low plasticity.												
-160.0															
			SILTY CLAY with SAND (CL-ML); stiff; very dark gray (10YR 3/1); wet; little SAND; mostly fines; medium plasticity.												
	180				S38	19	68	61				PP=1.0			
					S39	28				24	105				M, UW, PI
-165.0					S39	40				18	107				M, UW
			SILTY SAND (SM); very dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic.												
	185														
-170.0															Hole caved to 145 feet bgs on 2/13/2020 prior to start of drilling activities.
	190		- dense.		S40	19	36	94							
-175.0					S40	17									
					S40	19									
	195														
-180.0															
	200		- very dense; olive gray (5Y 5/2); trace subrounded GRAVEL, 1 in. max. dia.; coarse to medium SAND; little fines; iron oxide staining.		S41	34	50/5	45							
-185.0					S41	50/5"									
	205														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**7 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
PROJECT NUMBER: 20180876.001A
OFFICE FILTER: SAN DIEGO
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
-190.0	205		SILTY SAND (SM); very dense; olive gray (5Y 5/2); trace subrounded GRAVEL, 1 in. max. dia.; mostly coarse to medium SAND; little fines.												Practical refusal at 208 feet.
			Bottom of borehole at 208.0 ft bgs												
-195.0	210														
-200.0	215														
-205.0	220														
-210.0	225														
-215.0	230														
	235														

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**8 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
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gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

APPENDIX B

CONE PENETROMETER TEST (CPT) LOGS

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FUGRO
Fugro USA Land, Inc.
6100 Hillcroft Ave.
Houston, Texas 77081
USA

March 3, 2020
Report Number 04.09200002

KLEINFELDER
550 West C Street
Suite 1200
San Diego, California 92101
USA

Attn.: Janna Bonfiglio

REPORT FOR
PIEZOCONE PENETRATION TESTING,
SHEAR-WAVE VELOCITY MEASUREMENTS
AND RELATED SERVICES
DEL MAR, CALIFORNIA

Dear. Ms. Bonfiglio,

Introduction

Fugro is pleased to present data report for Piezocone Penetration Testing, Seismic Shear-Wave Velocity Measurements and Related Services performed at the above-referenced site. This report contains the scope of services performed and the test results.

Scope of Services

We performed four (4) Piezocone Penetration Tests (PCPT) to depths ranging from 16 ft to 200 ft below ground surface and one (1) Seismic PCPT (SCPT) to a depth of 200 ft penetration. All PCPT sounding locations were grouted after the completion of the tests.

PCPT Testing

The PCPT soundings were conducted in general accordance with ASTM D5778-12, *Electronic Friction Cone and Piezocone Penetration Testing of Soils* using a 30-ton truck mounted CPT unit. The in-situ soil data was obtained by hydraulically advancing a cylindrical steel rod, with an instrumented probe at the base,

vertically into the subsurface materials at a constant rate of 2 centimeters per second. The instrumented probe consists of a cone-shaped tip element, with an apex angle of 60 degrees with a base area of 15 square centimeters (cm^2) and a cylindrical-shaped side friction sleeve with a surface area of 200 cm^2. A pore transducer is mounted between the tip and friction sleeve. Measurements of penetration resistance at the cone tip (q_c), frictional resistance along the friction sleeve (f_s), and pore water pressure (u_2), were recorded

with depth during penetration. PCPT sounding measurements collected for this project are presented on the logs attached at the end of this report.

PCPT methods test the soil *in situ* and soil samples are not obtained. There are several methods to identify the soil type using the PCPT data collected. For your reference, we have presented soil stratigraphy using the attached *Campanella and Robertson's Simplified Soil Behavior Chart (12-zone, 1986)*.

Shear Wave Velocity Measurements

The shear wave velocity measurements were conducted in general accordance with ASTM D7400-08, *Standard Test Methods for Downhole Seismic Testing* during the PCPT sounding. A PCPT tip with x, y, and z geophones located behind the friction sleeve was used. Seismic readings were taken at 5 foot depth intervals during the sounding. The energy source for the seismic readings was a metal shear beam struck horizontally. Multiple readings were stacked at each interval. The interval velocities were determined from arrival times and relative arrival times of horizontally polarized shear (SH) seismic waves.

Please note that because of the empirical nature of the soil behavior chart, the soil identification should be verified locally from soil borings and laboratory testing. Some soils, such as cemented or calcareous soils, or glacial tills are outside the limits of the soil behavior chart.

Closing

Fugro appreciates the opportunity to be of service to you. If you have any questions, please feel free to contact me at 713.346.4004.

Best Regards,

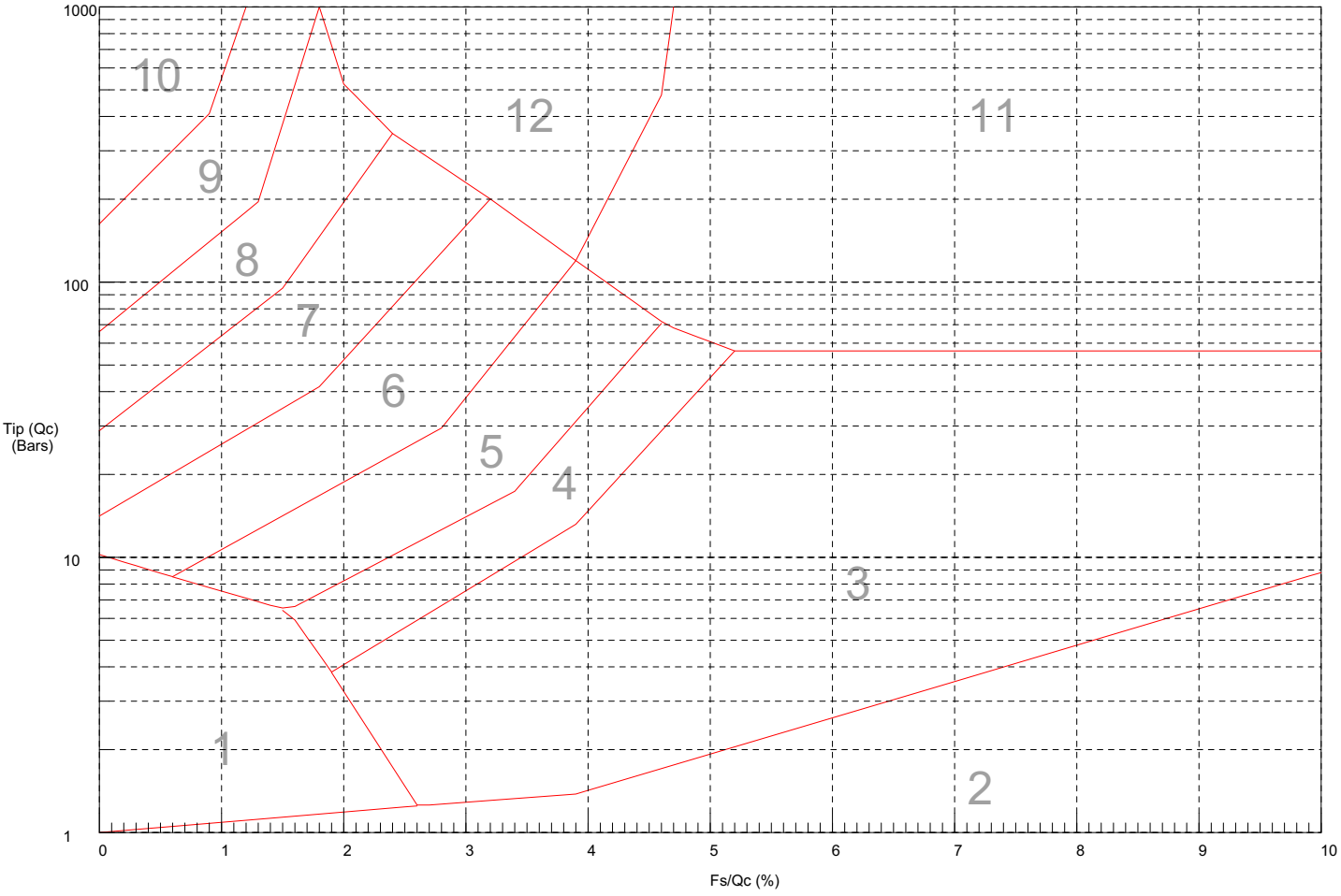
Sheldon Collins
Service Line Manager – CPT
North America

SC/am

Attachments: *Campanella and Robertson's Simplified Soil Behavior Chart* (1 page)
PCPT Sounding Logs (9 pages)
Four (4) Electronic Data Files
Plots of Shear Waves and Shear Waves Velocity (2 pages)
One (1) Shear Wave Velocity Spreadsheets

12 Zone Soil Behavior Chart

Classification Data:
Robertson and Campanella UBC-1986



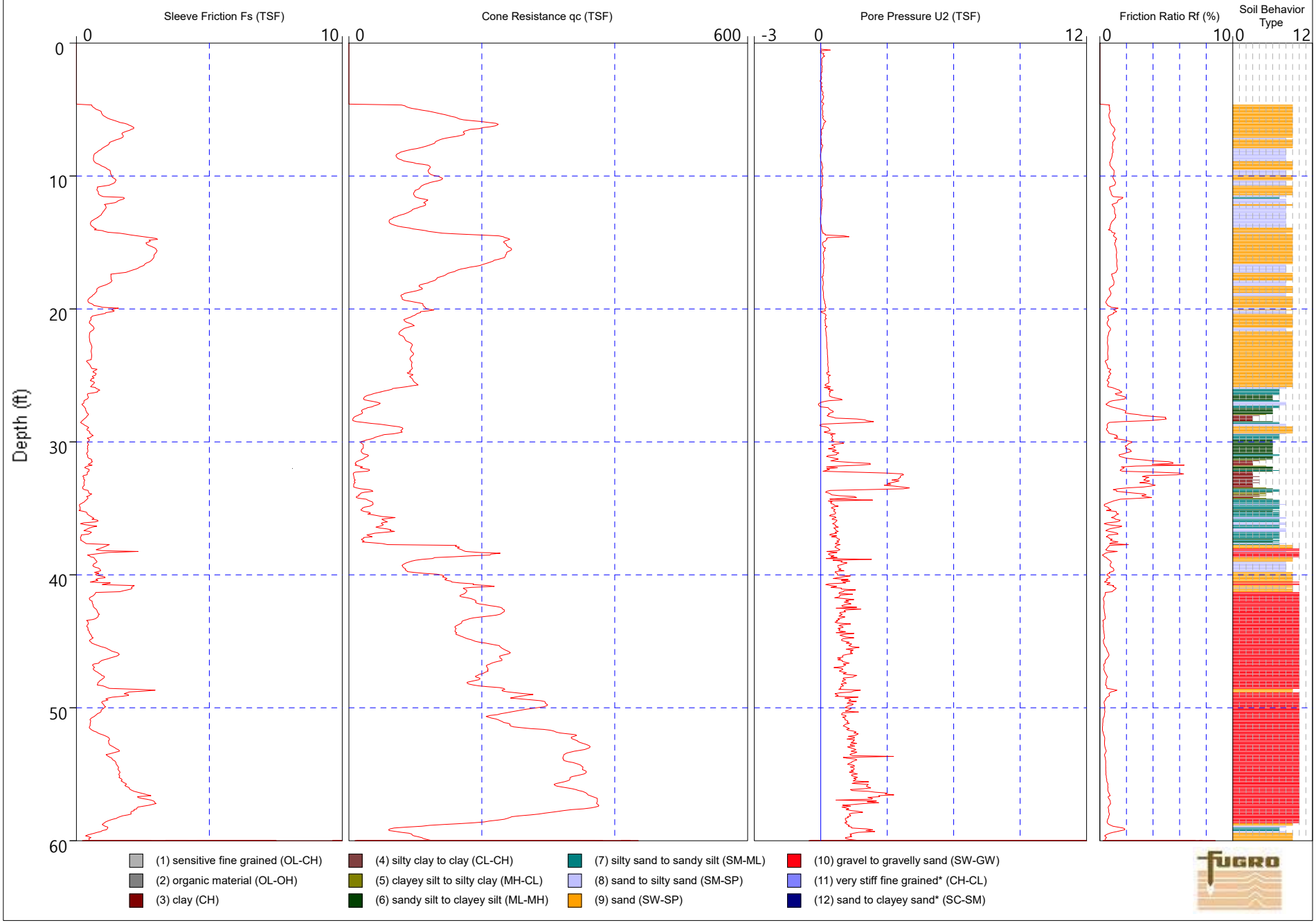
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

* Overconsolidated or cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

CPT Number: CPT-20-001
Date: 18-Feb-2020
Elevation: 0.00

Coordinates: 32.976127, -117.269275
Cone Number: CP15-CF25PB7SN2-P1E1 2111

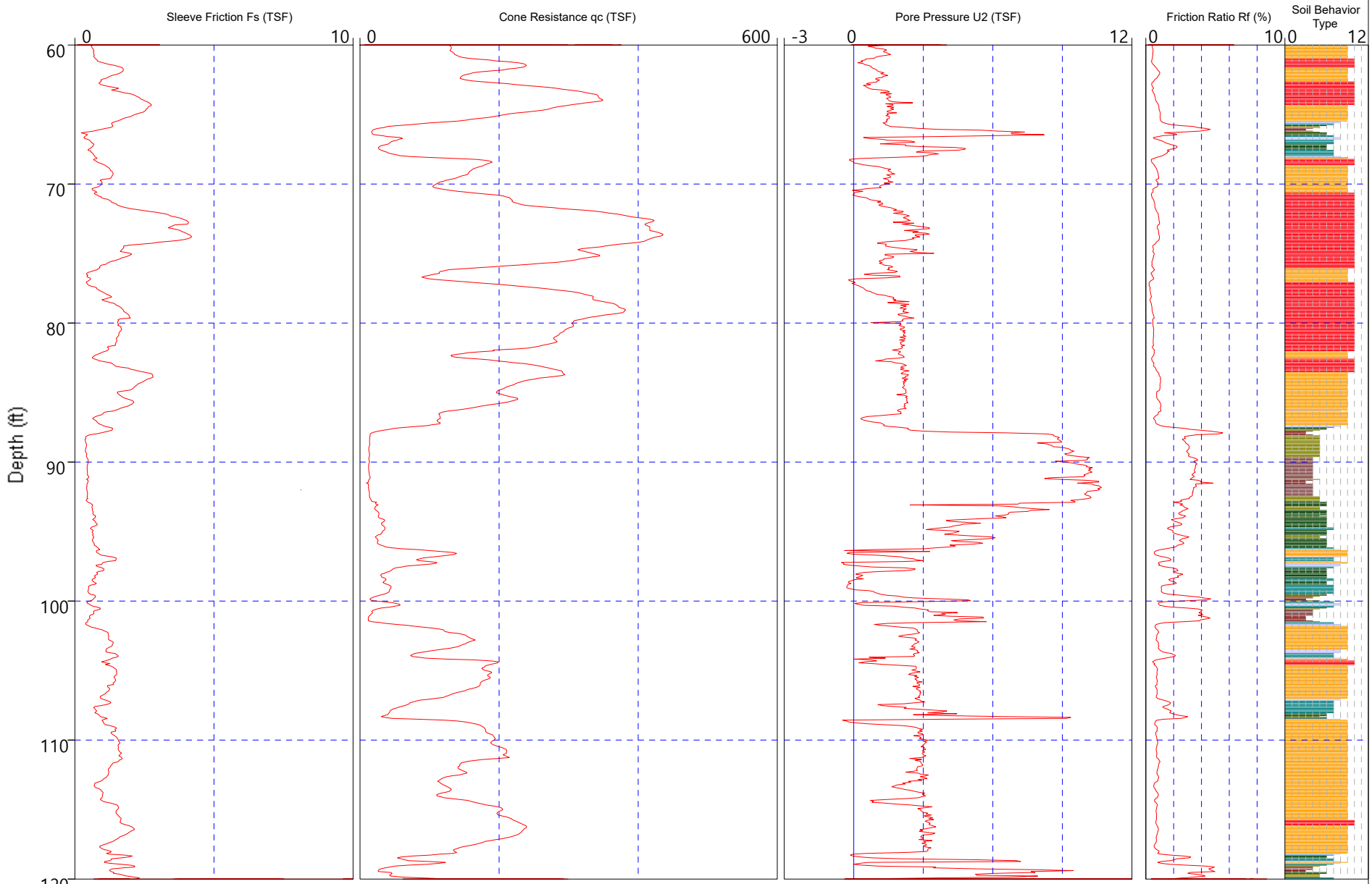


Robertson et al. 1986 *Overconsolidated or Cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

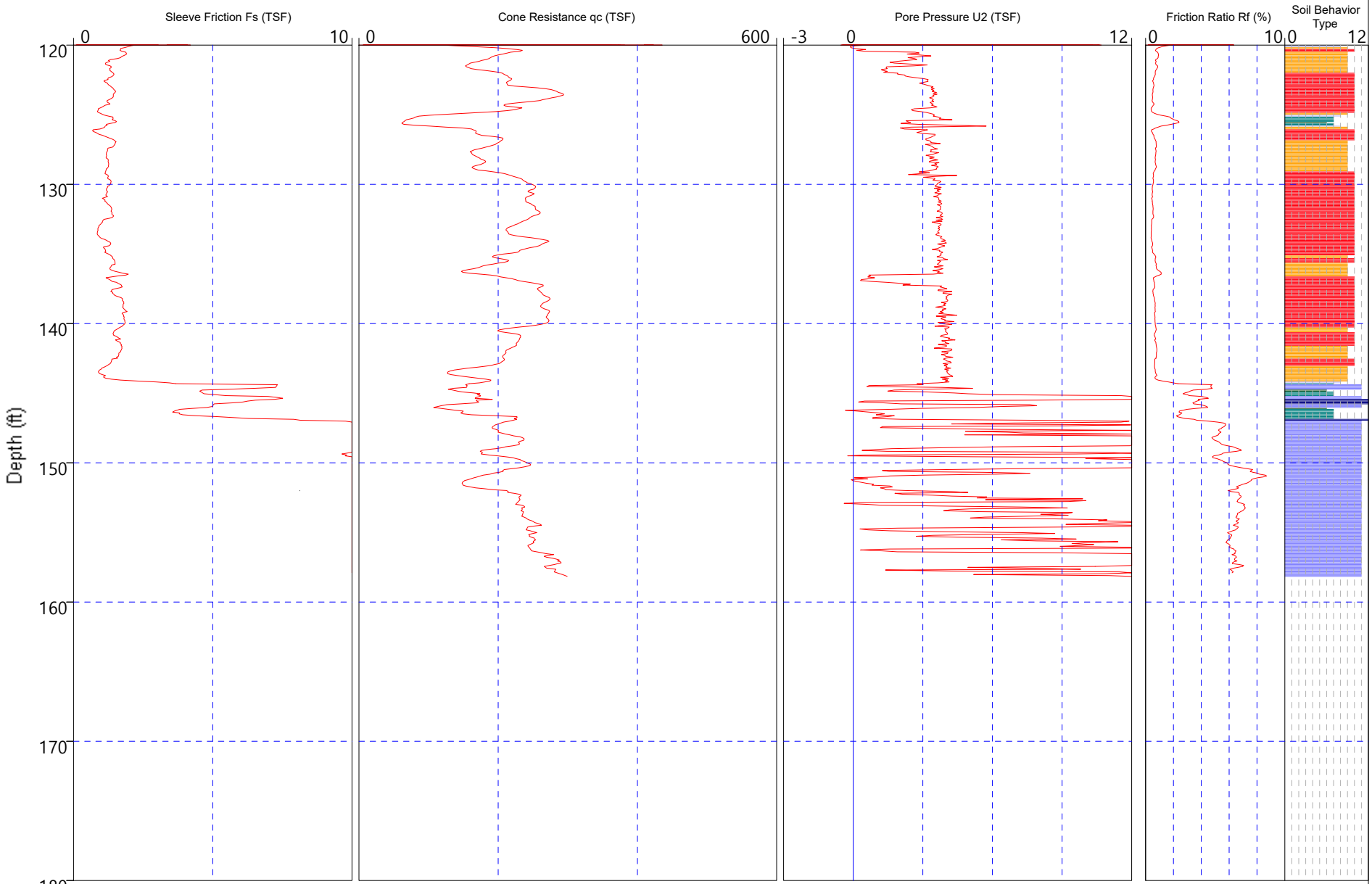
CPT Number: CPT-20-001
Date: 18-Feb-2020
Elevation: 0.00

Coordinates: 32.976127, -117.269275
Cone Number: CP15-CF25PB7SN2-P1E1 2111



Robertson et al. 1986 *Overconsolidated or Cemented

Job Number:	04.09200002	**CPT Number:**	CPT-20-001	**Coordinates:**	32.976127, -117.269275
Operator:	D. Garza	**Date:**	18-Feb-2020	**Cone Number:**	CP15-CF25PB7SN2-P1E1 2111
Location:	Del Mar, CA	**Elevation:**	0.00		



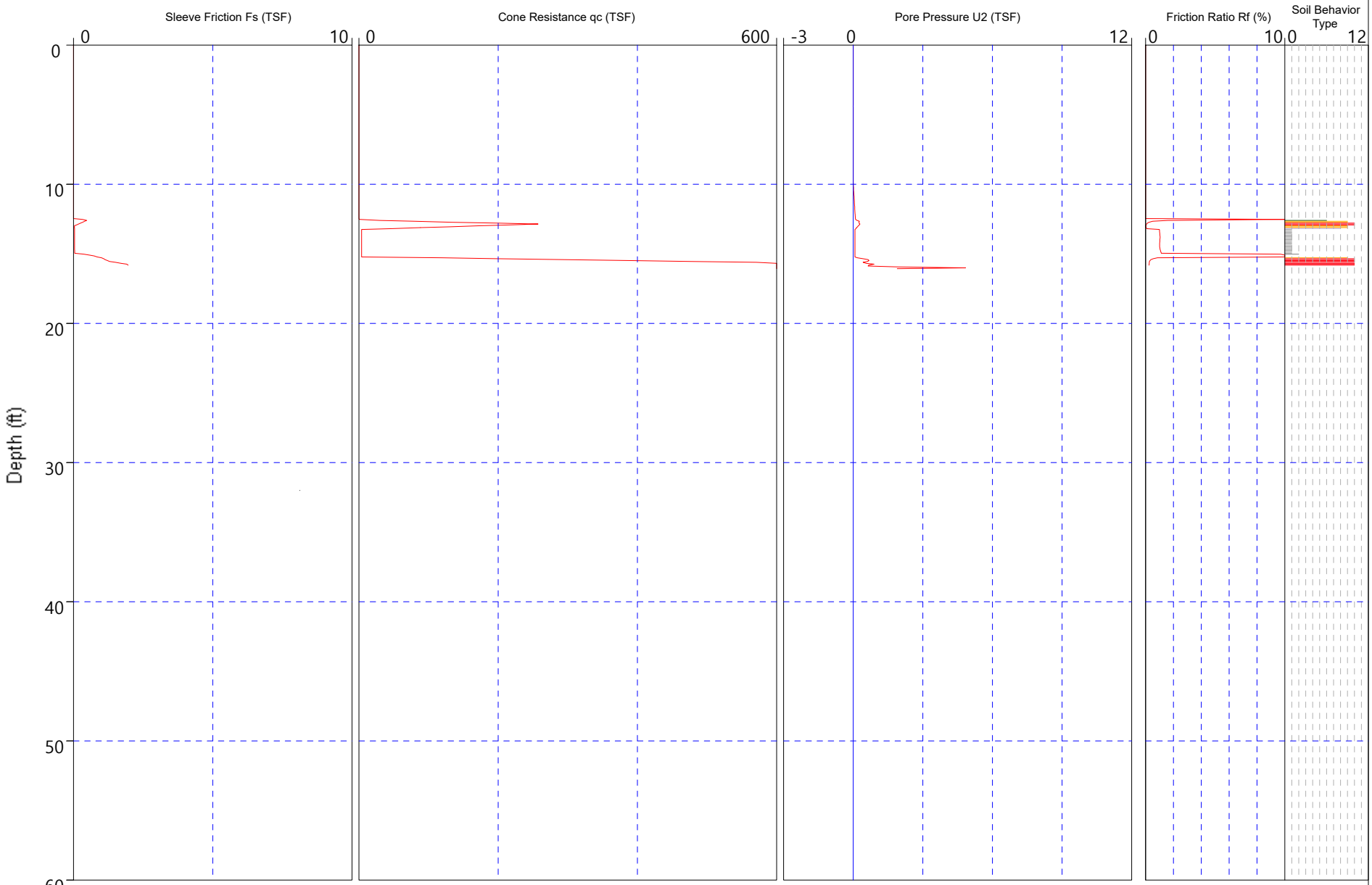
(1) sensitive fine grained (OL-CH)
(2) organic material (OL-OH)
(3) clay (CH)
(4) silty clay to clay (CL-CH)
(5) clayey silt to silty clay (MH-CL)
(6) sandy silt to clayey silt (ML-MH)
(7) silty sand to sandy silt (SM-ML)
(8) sand to silty sand (SM-SP)
(9) sand (SW-SP)
(10) gravel to gravelly sand (SW-GW)
(11) very stiff fine grained* (CH-CL)
(12) sand to clayey sand* (SC-SM)

Robertson et al. 1986 *Overconsolidated or Cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

CPT Number: CPT-20-002
Date: 21-Feb-2020
Elevation: 0.00

Coordinates: 32.975012, -117.268971
Cone Number: CP15-CF75PB7SN2-P1E1 2999



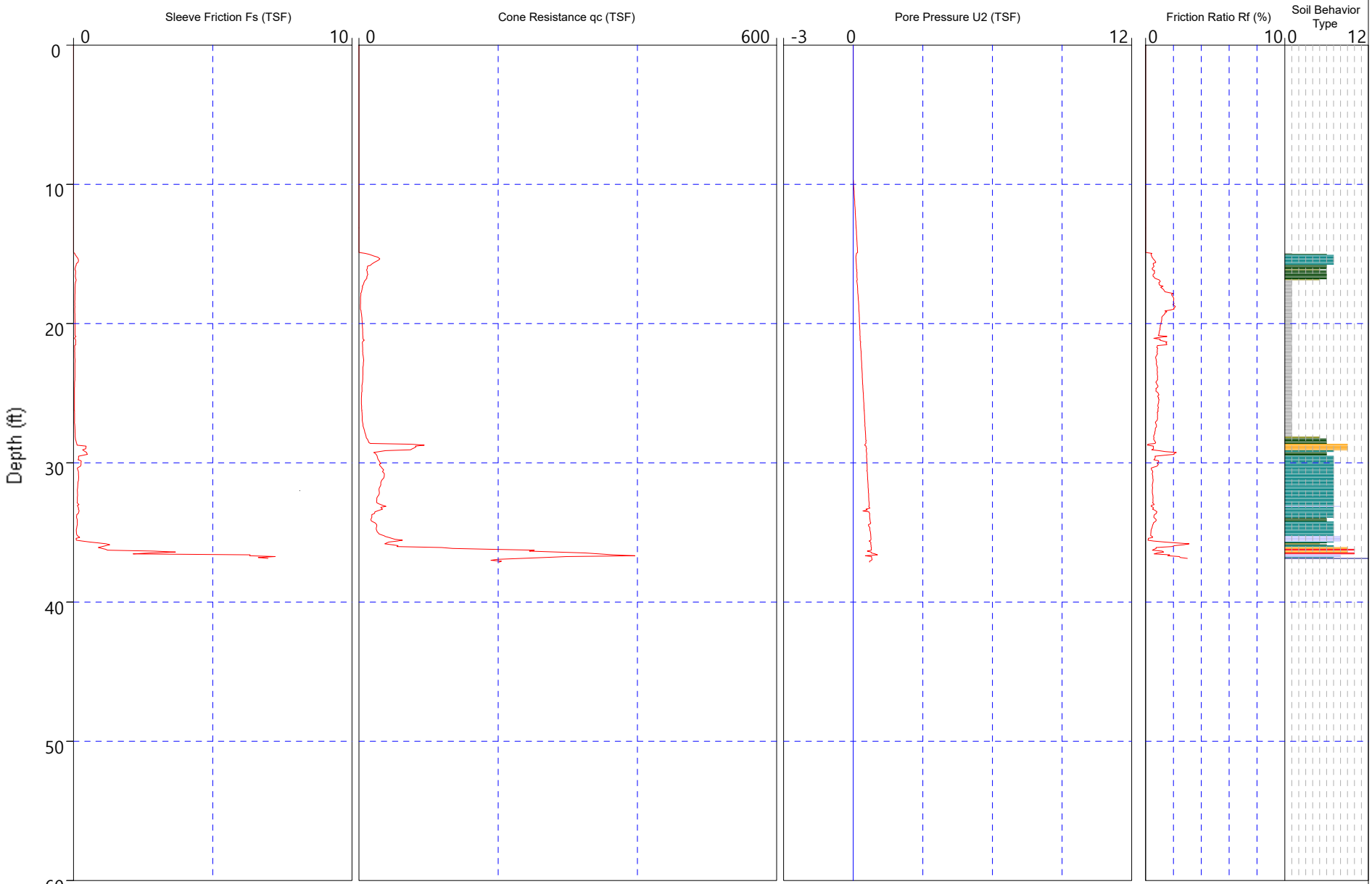
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(2) organic material (OL-OH)
(3) clay (CH)
(4) silty clay to clay (CL-CH)
(5) clayey silt to silty clay (MH-CL)
(6) sandy silt to clayey silt (ML-MH)
(7) silty sand to sandy silt (SM-ML)
(8) sand to silty sand (SM-SP)
(9) sand (SW-SP)
(10) gravel to gravelly sand (SW-GW)
(11) very stiff fine grained* (CH-CL)
(12) sand to clayey sand* (SC-SM)

Robertson et al. 1986 *Overconsolidated or Cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

CPT Number: CPT-20-002A
Date: 21-Feb-2020
Elevation: 0.00

Coordinates: 32.975012, -117.268971
Cone Number: CP15-CF75PB7SN2-P1E1 2999

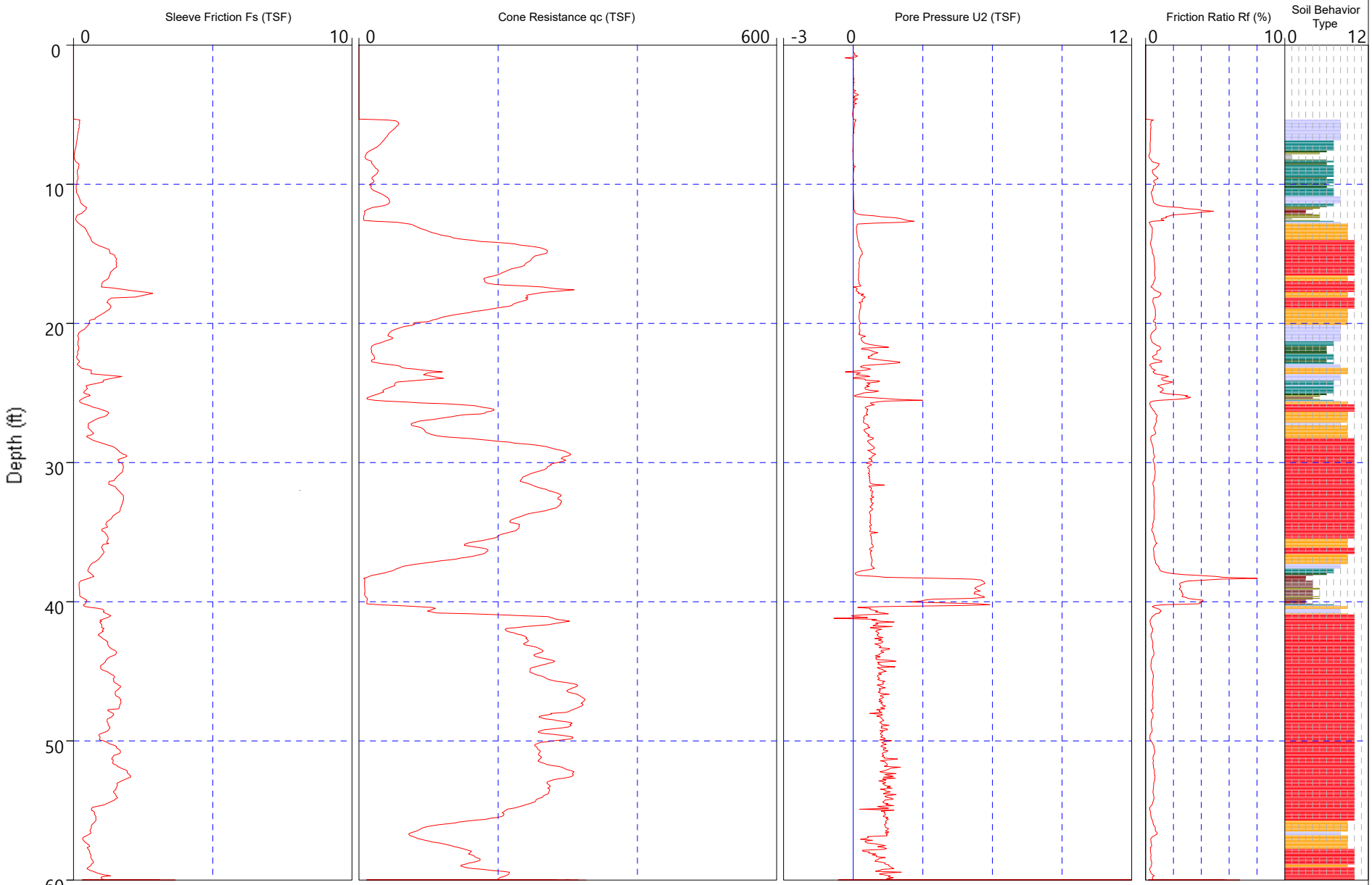


Robertson et al. 1986 *Overconsolidated or Cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

CPT Number: CPT-20-003
Date: 19-Feb-2020
Elevation: 0.00

Coordinates: 32.973928, -117.268763
Cone Number: CP15-CF75PB7SN2-P1E1 2999



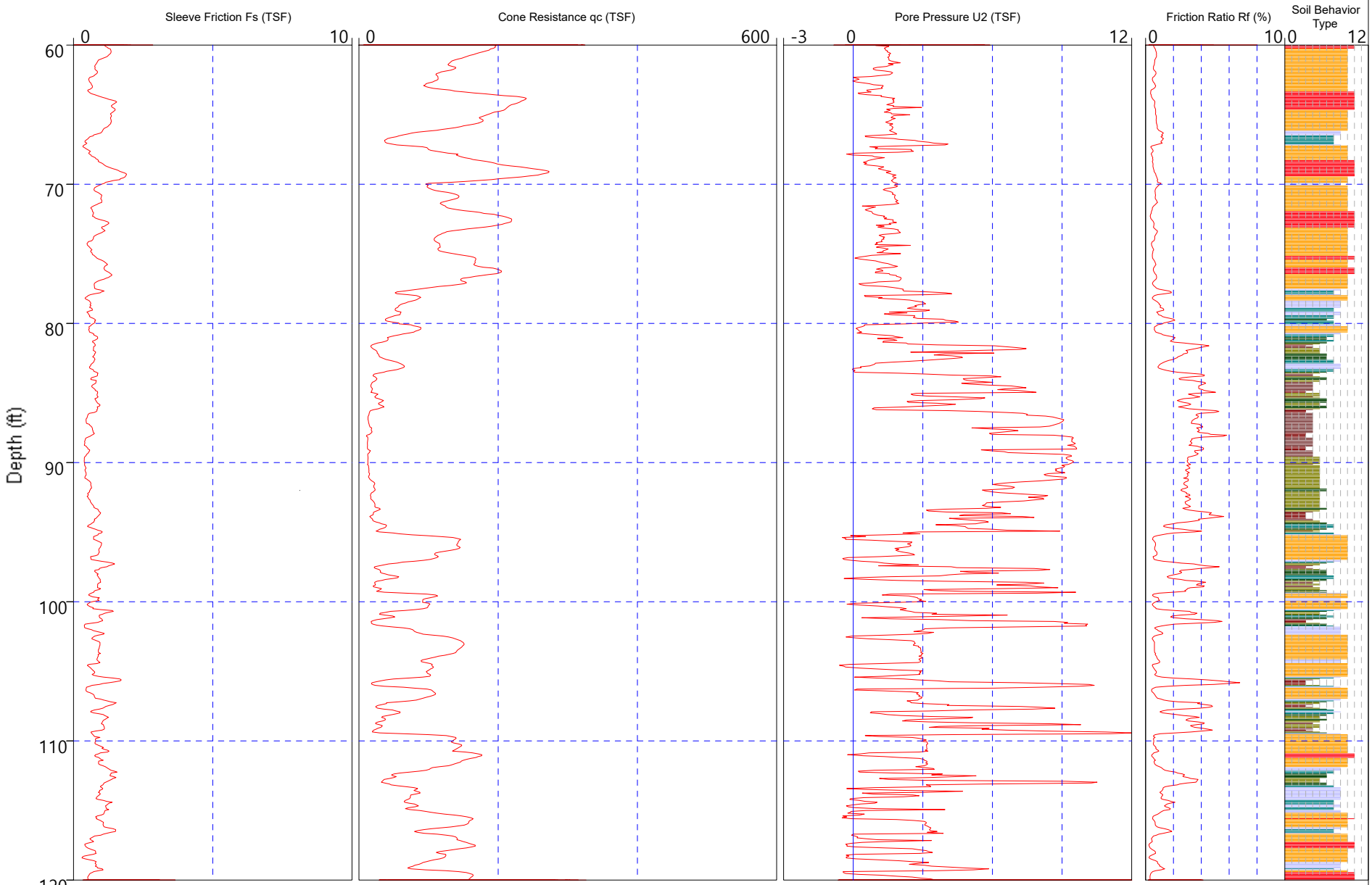
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(2) organic material (OL-OH)
(3) clay (CH)
(4) silty clay to clay (CL-CH)
(5) clayey silt to silty clay (MH-CL)
(6) sandy silt to clayey silt (ML-MH)
(7) silty sand to sandy silt (SM-ML)
(8) sand to silty sand (SM-SP)
(9) sand (SW-SP)
(10) gravel to gravelly sand (SW-GW)
(11) very stiff fine grained* (CH-CL)
(12) sand to clayey sand* (SC-SM)

Robertson et al. 1986 *Overconsolidated or Cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

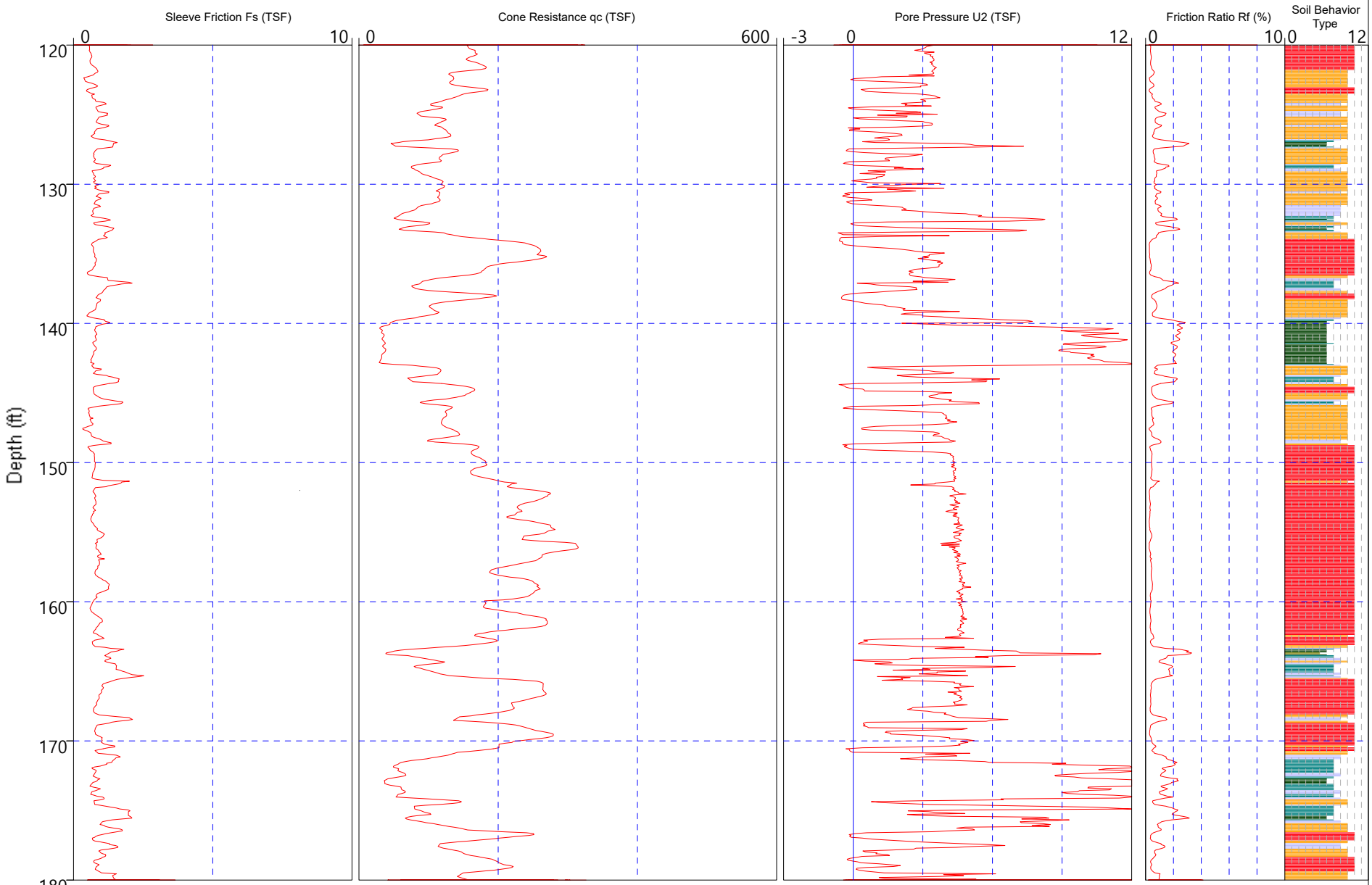
CPT Number: CPT-20-003
Date: 19-Feb-2020
Elevation: 0.00

Coordinates: 32.973928, -117.268763
Cone Number: CP15-CF75PB7SN2-P1E1 2999



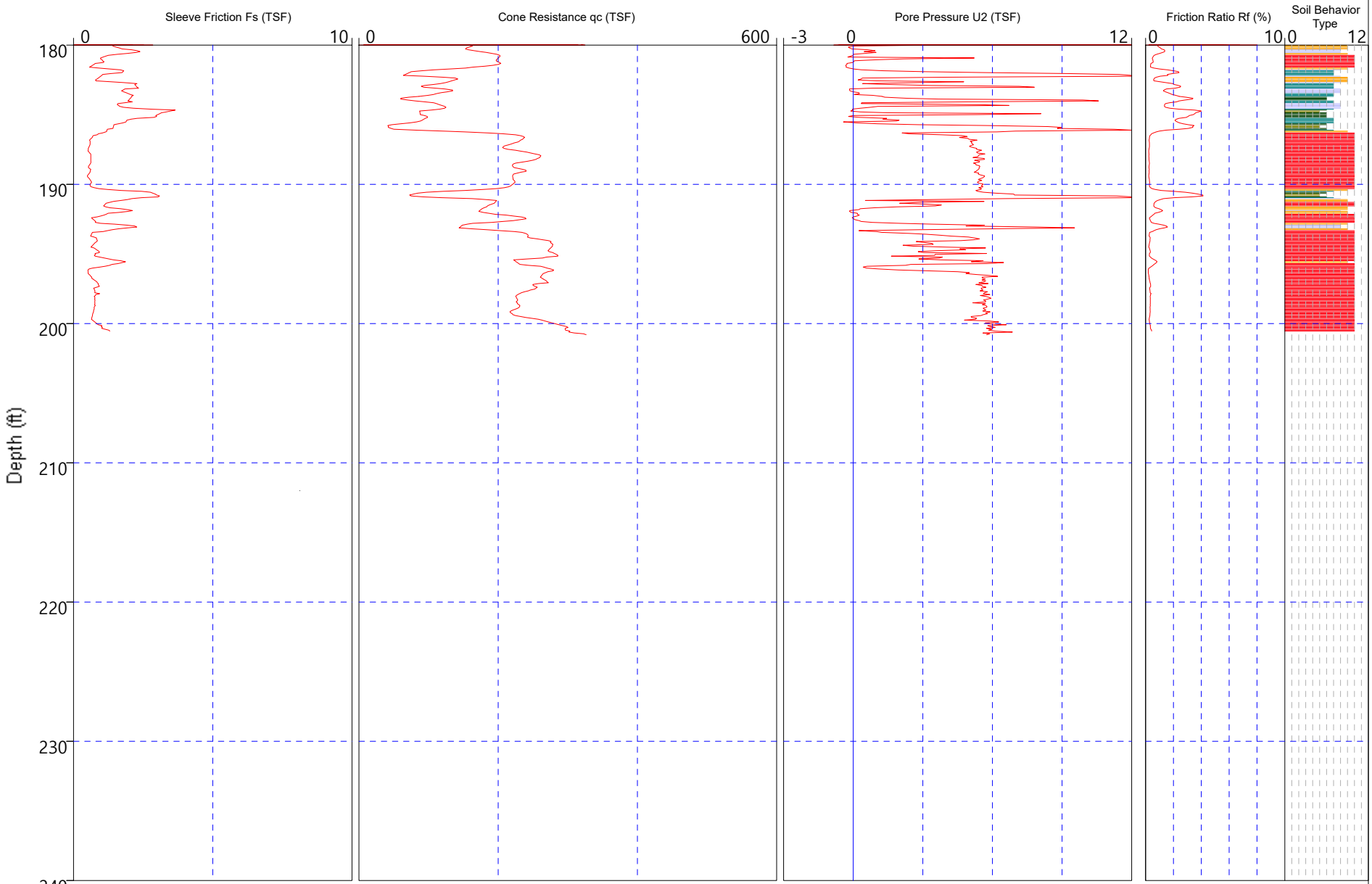
Robertson et al. 1986 *Overconsolidated or Cemented

Job Number:	04.09200002	**CPT Number:**	CPT-20-003	**Coordinates:**	32.973928, -117.268763
Operator:	D. Garza	**Date:**	19-Feb-2020	**Cone Number:**	CP15-CF75PB7SN2-P1E1 2999
Location:	Del Mar, CA	**Elevation:**	0.00		

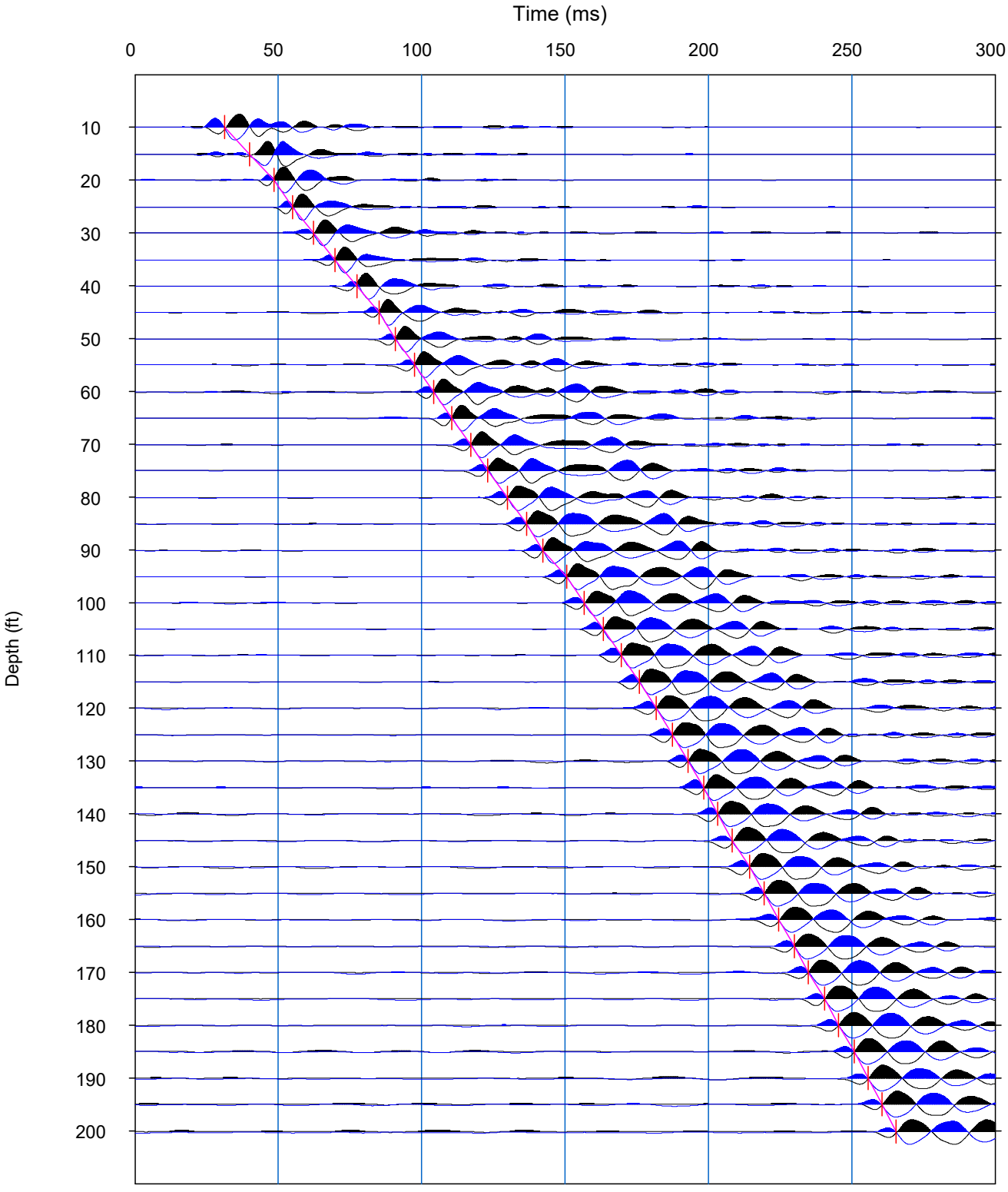


Robertson et al. 1986 *Overconsolidated or Cemented

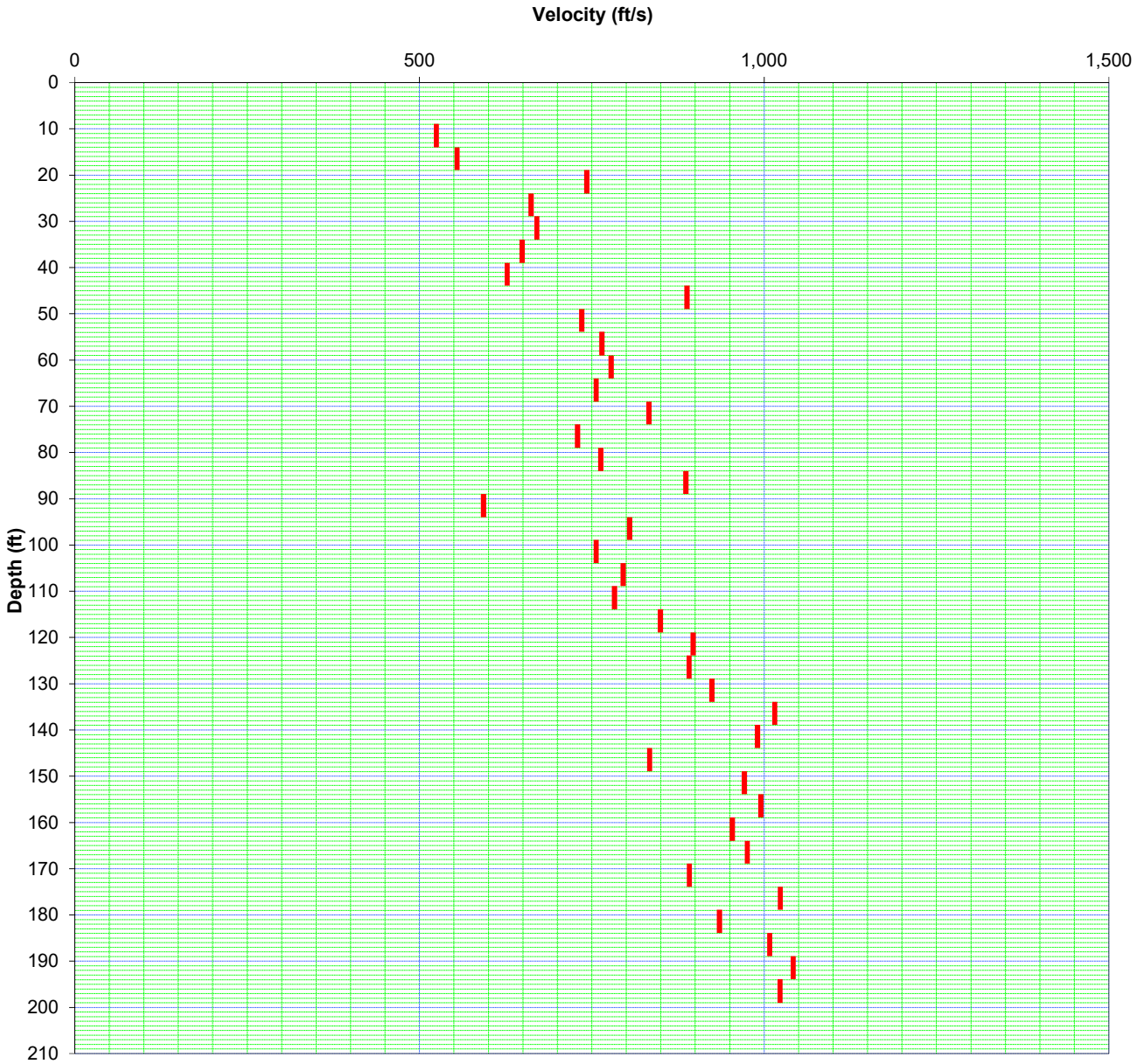
Job Number:	04.09200002	**CPT Number:**	CPT-20-003	**Coordinates:**	32.973928, -117.268763
Operator:	D. Garza	**Date:**	19-Feb-2020	**Cone Number:**	CP15-CF75PB7SN2-P1E1 2999
Location:	Del Mar, CA	**Elevation:**	0.00		



Robertson et al. 1986 *Overconsolidated or Cemented



CPT-20-003
SHEAR WAVE WAVEFORMS
CAMINO DEL MAR BRIDGE
DEL MAR, CALIFORNIA
KLEINFELDER



CPT-20-003
SHEAR WAVE VELOCITIES
CAMINO DEL MAR BRIDGE
DEL MAR, CALIFORNIA
KLEINFELDER

FUGRO

APPENDIX C
LABORATORY TEST RESULTS

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APPENDIX C

LABORATORY TEST RESULTS

Laboratory tests were performed on selected bulk and drive samples from our borehole explorations to estimate engineering characteristics of the various earth materials encountered. Testing was performed in accordance with ASTM and Caltrans standards and are presented in herein.

MOISTURE CONTENT AND DRY UNIT WEIGHT

Natural moisture content and dry unit weight tests were performed on selected bulk and drive samples collected from the boreholes in accordance with ASTM D2216 and D7263, respectively. The results are presented on the boring logs in Appendix A and in Appendix C as Figures C-1 through C-3.

GRADATION ANALYSIS

Sieve analyses were performed on selected samples of the materials encountered at the site to evaluate the gradation characteristics of the soil and to aid in classification. The tests were performed in general accordance with ASTM D1140 for percent finer than No. 200 sieve tests and ASTM D6913 for full gradation analyses. The results are presented in Appendix C as Figures C-4 through C-24.

ATTERBERG LIMITS

Atterberg limit tests were performed on fine-grained portions of selected soil samples to evaluate the plasticity characteristics (liquid limit, plastic limit, and plasticity index) of the soil and to aid in its classification. The tests were performed in general accordance with ASTM D4318. The results are presented in Appendix C as Figures C-25 and C-26.

TRIAXIAL COMPRESSION (UU) TEST

Three unconfined, unconsolidated (UU) triaxial compression tests were performed on selected soil samples from the borings performed at the site. The test procedures were performed in general accordance with the ASTM D2850. The results are presented in Appendix C as Figures C-27 through C-29.

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UNCONFINED COMPRESSION TEST

An unconfined compression test was performed on a soil sample from boring R-20-002. The test procedures were performed in general accordance with the ASTM D2166. The results are presented in Appendix C as Figure C-30.

R-VALUE

Two R-Value tests were performed on selected bulk samples to evaluate resistance values of the near surface soils. The tests were performed using modified effort in general accordance with ASTM D2844. The results are presented in Appendix C and Figures C-31 and C-32.

CORROSION TESTS

A series of chemical tests were performed on four selected bulk and driven samples of the near surface and at-depth soils to estimate pH, minimum resistivity, and sulfate and chloride contents. The test procedures were in general accordance with the California Tests 417, 422, and 643. The test results are provided in Appendix C as Figures C-33 through C-36.

DIRECT SHEAR TEST

Five direct shear strength tests were performed on selected driven soil samples from the borings. The test procedures were performed in general accordance with the ASTM D3080. The results are presented in Appendix C as Figures C-37 through C-41.

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Date Tested 3/16-20/2020

Boring No.	R-20-001	R-20-001	R-20-001	R-20-001	R-20-001
Sample No.	**S1**	**S3**	**S5**	**S6**	**S7**
Depth, ft.	**0.5-5**	**8-9.5**	**12-13.5**	**14-15.5**	**16-17.5**
Wet Weight, g	604.3	324.4	129.3	347.4	432.6
Dry Weight, g	587.1	309.4	113.2	278.3	340.1
Moisture Content, %	2.9	4.8	14.2	24.8	27.2
Sample Description	Dark brown poorly graded sand with silt	Brown poorly graded sand with silt	Dark brown poorly graded sand with silt	Dark gray poorly graded sand with silt	Dark gray poorly graded sand with silt

Boring No.	R-20-001	R-20-002	R-20-002	R-20-002	R-20-002
Sample No.	**S8**	**S1**	**S3**	**S5**	**S7**
Depth, ft.	**18-19.5**	**0.5-4**	**7-8.5**	**11-12.5**	**15-16.5**
Wet Weight, g	341.8	617.3	234.0	361.3	353.8
Dry Weight, g	272.3	594.4	224.4	297.9	279.6
Moisture Content, %	25.5	3.9	4.3	21.3	26.5
Sample Description	Dark gray poorly graded sand with silt	Dark brown poorly graded sand	Light gray poorly graded sand with silt	Dark brown poorly graded sand with silt	Dark gray poorly graded sand

Performed in General Accordance with ASTM D2216

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CHECKED BY: J.B Tech T.C.

JOB NUMBER: 20180876.001A DATE: 6-Apr-20

Moisture Content Determination

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-1

Date Tested 3/16-20/2020

Boring No.	**R-20-002**				
Sample No.	**S8**				
Depth, ft.	**17-18.5**				
Wet Weight, g	349.6				
Dry Weight, g	276.1				
Moisture Content, %	26.6				
Sample Description	Dark gray poorly graded sand with silt				

Boring No.					
Sample No.					
Depth, ft.					
Wet Weight, g					
Dry Weight, g					
Moisture Content, %					
Sample Description					

Performed in General Accordance with ASTM D2216

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CHECKED BY: J.B. Tech T.C.

JOB NUMBER: 20180876.001A DATE: 2-Apr-20

Moisture Content Determination

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-2

Date Tested : 3/10-20/2020

Boring #	Sample #	Depth (ft)	Dry Density (pcf)	Moisture Content (%)	Description
R-20-001	S11	30-31.5	65.6	55.2%	Dark gray sandy clay
R-20-001	S13	50-51.5	110.3	20.6%	Gray silty sand
R-20-001	S15	60-61.5	101.5	24.5%	Gray silty sand
R-20-001	S17	70-71.5	108.3	21.1%	Gray poorly graded sand with silt
R-20-001	S19	80-81.5	106.7	20.5%	Gray poorly graded sand with silt
R-20-001	S25	110-111.5	92.1	31.5%	Gray silty sand
R-20-001	S27	120-121.5	102.7	25.1%	Gray silty sand
R-20-002	S10	25-26.5	99.9	26.4%	Dark gray silty sand
R-20-002	S12	35-36.5	101.3	24.2%	Dark gray silty sand
R-20-002	S18	65-66.5	96.0	28.9%	Dark gray poorly graded sand with silt
R-20-002	S14	45-46.5	105.3	23.5%	Dark gray poorly graded sand with silt
R-20-002	S16	55-56.5	92.2	36.7%	Dark gray poorly graded sand with silt
R-20-002	S20	75-76.5	95.5	29.9%	Dark gray poorly graded sand with silt
R-20-002	S30	125-126.5	94.2	30.5%	Dark gray silty sand
R-20-002	S34	145-146.5	91.9	28.7%	Dark gray silty sand
R-20-002	S24	95-96.5	94.5	28.1%	Dark gray silty sand
R-20-002	S28	115-116.5	104.4	29.4%	Dark gray silty sand
R-20-002	S41	181-181.5	106.6	17.9%	Dark gray silty sand

Performed in General Accordance with ASTM D7263 B and D2216

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CHECKED BY: J.B. TECH: M.S.L

JOB NUMBER: 20180876.001A DATE: 2-Apr-20

Dry Density and Moisture Content

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-3

Date Tested 3/10-20/2020

Boring No	R-20-001	R-20-001	R-20-001	R-20-001	R-20-001
Sample No.	S3	S7	S12	S25	S31
Depth, ft.	8-9.5	16-17.5	35-36.5	110-111.5	150-151
Dry Weight before wash, g	309.4	340.1	148.2	265.4	235.1
Dry Weight After Wash, g	274.4	326.9	56.6	242.8	68.2
Weight Loss, No. 200, g	35.0	13.2	91.6	22.6	166.9
Wash No. 200, %	**11.3**	**3.9**	**61.8**	**8.5**	**71.0**
Sample Description	Brown poorly graded sand with silt	Dark gray poorly graded sand	Dark gray sandy fat clay	Dark gray poorly graded sand with silt	Gray brown sandy fat clay

Boring No	R-20-002	R-20-002	R-20-002	R-20-002	R-20-002
Sample No.	S3	S7	S11	S17	S21
Depth, ft.	7-8.5	15-16.5	30-31.5	60-61.5	80-81.5
Dry Weight before wash, g	224.4	279.6	255.2	318.5	286.4
Dry Weight After Wash, g	211.9	270.6	235.9	282.5	170.6
Weight Loss, No. 200, g	12.5	9.0	19.3	36.0	115.8
Wash No. 200, %	**5.6**	**3.2**	**7.6**	**11.3**	**40.4**
Sample Description	Light gray poorly graded sand with silt	Dark gray poorly graded sand	Dark gray poorly graded sand with silt	Dark gray poorly graded sand with silt	Dark gray silty sand

Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

TEST PERFORMED IN ACCORDANCE WITH ASTM D 1140

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Materials Finer than 75 um (No 200) Sieve

FIGURE

C-4

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

CHECKED BY: J.B. Tech T.C.

JOB NUMBER: 20180876.001A DATE: 1-Apr-20

Date Tested 3/10-20/2020

Boring No	R-20-002	R-20-002			
Sample No.	S23	S33			
Depth, ft.	90-91.5	140-141.5			
Dry Weight before wash, g	253.5	288.9			
Dry Weight After Wash, g	78.3	180.2			
Weight Loss, No. 200, g	175.2	108.7			
Wash No. 200, %	**69.1**	**37.6**			
Sample Description	Dark gray sandy clay	Dark gray silty sand			

Boring No					
Sample No.					
Depth, ft.					
Dry Weight before wash, g					
Dry Weight After Wash, g					
Weight Loss, No. 200, g					
Wash No. 200, %					
Sample Description					

Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

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JOB NUMBER: 20180876.001A DATE: 1-Apr-20

Materials Finer than 75 um (No 200) Sieve

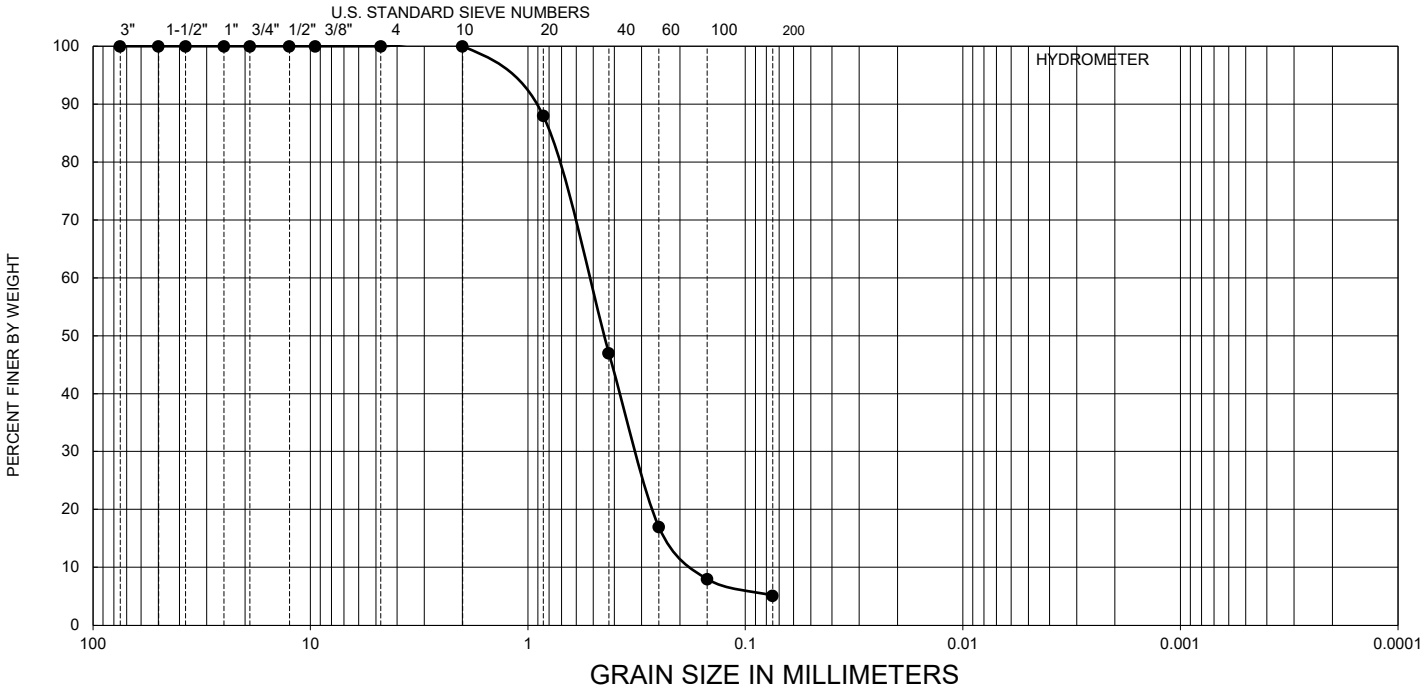
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-5

Date Tested: **3/12/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S1	0.5-5	5.1	SP-SM

Sample Description	Dark brown Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	88
No. 40	0.425 mm	47
No. 60	0.25 mm	17
No 100	0.15 mm	8
No 200	.075 mm	5.1

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Project No.	20180876.001A	Date:	1-Apr-20

GRADATION TEST RESULTS

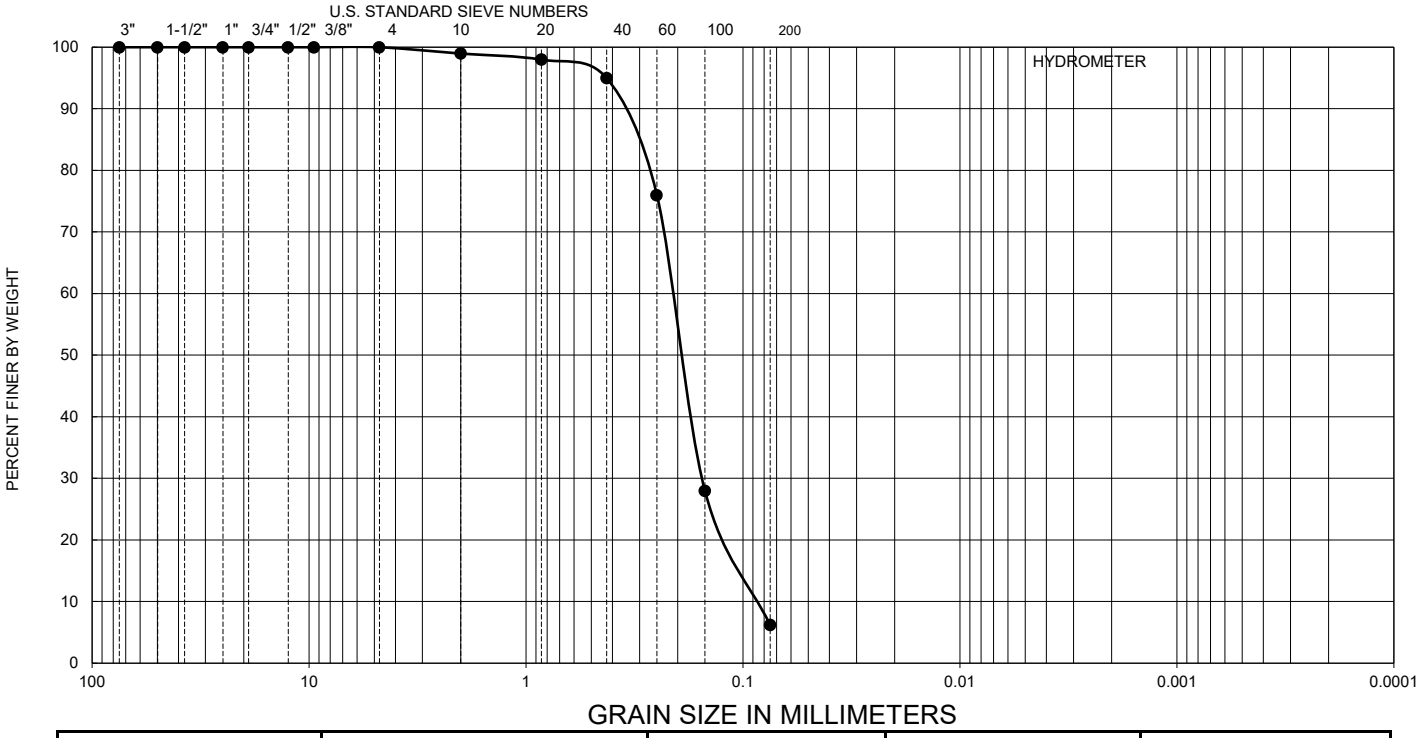
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-6

Date Tested: **3/12/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S5	12-13.5	6.2	SP-SM

Sample Description	Dark brown Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	99
No. 20	0.85 mm	98
No. 40	0.425 mm	95
No. 60	0.25 mm	76
No 100	0.15 mm	28
No 200	.075 mm	6.2

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

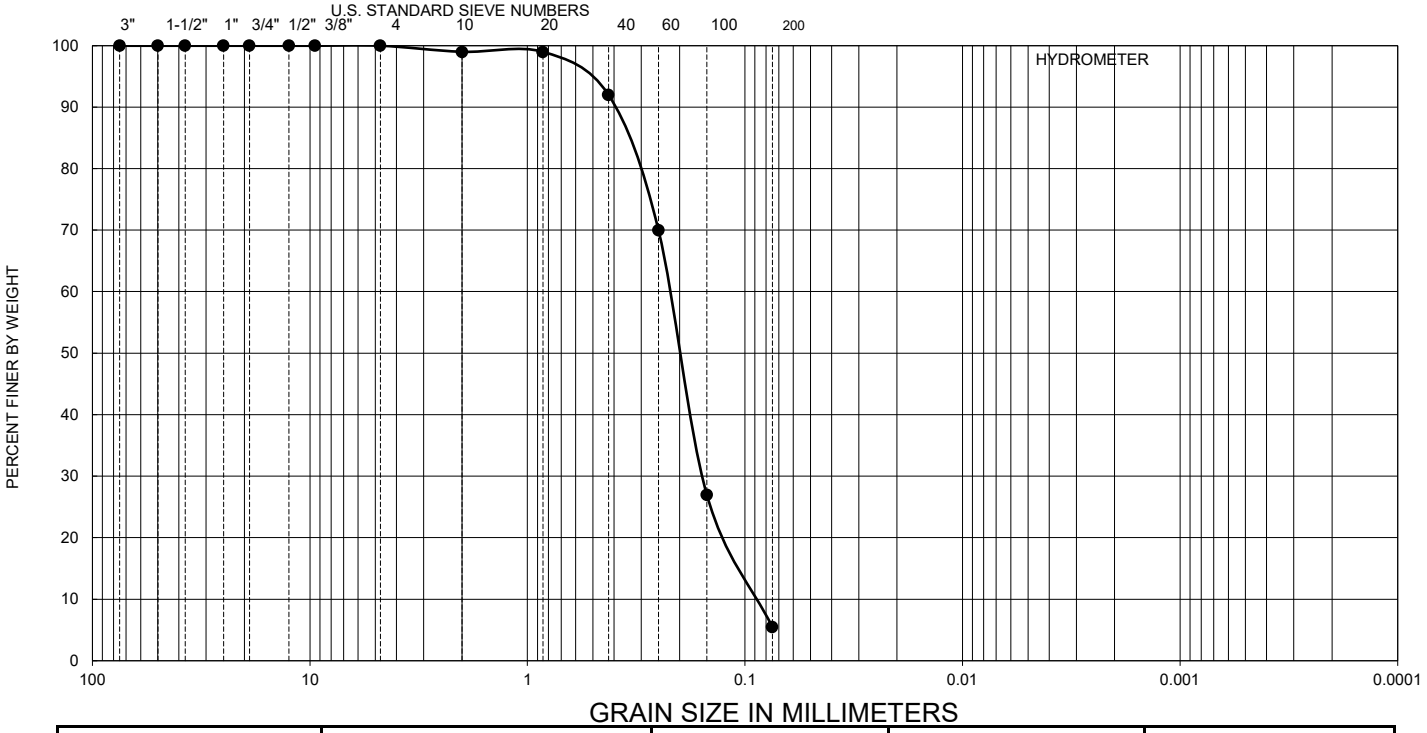
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-7

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S9	20-21.5	5.5	SP-SM

Sample Description	Dark brown Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	99
No. 20	0.85 mm	99
No. 40	0.425 mm	92
No. 60	0.25 mm	70
No 100	0.15 mm	27
No 200	.075 mm	5.5

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

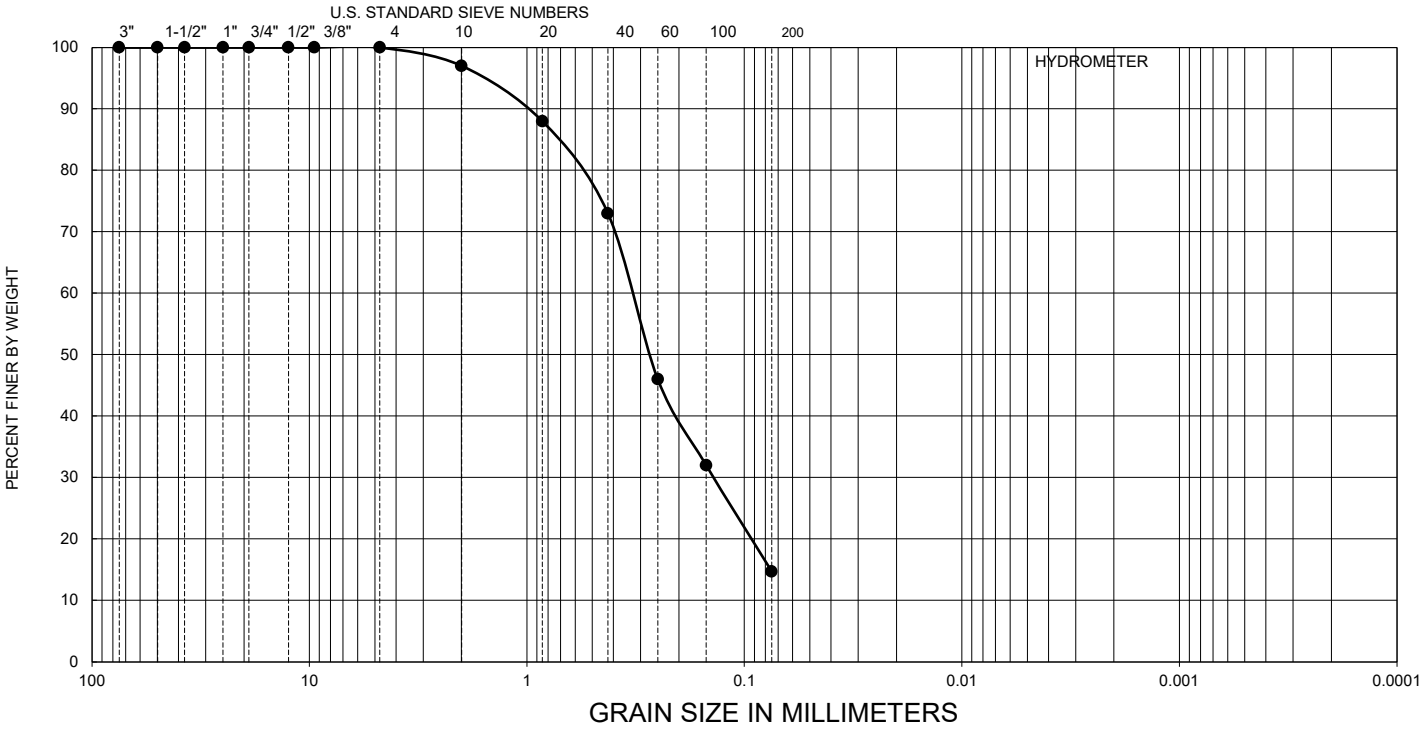
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-8

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S13	50-51.5	14.7	SM

Sample Description	Dark brown Silty sand

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	97
	No. 20	0.85 mm	88
	No. 40	0.425 mm	73
	No. 60	0.25 mm	46
	No 100	0.15 mm	32
	No 200	.075 mm	14.7

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

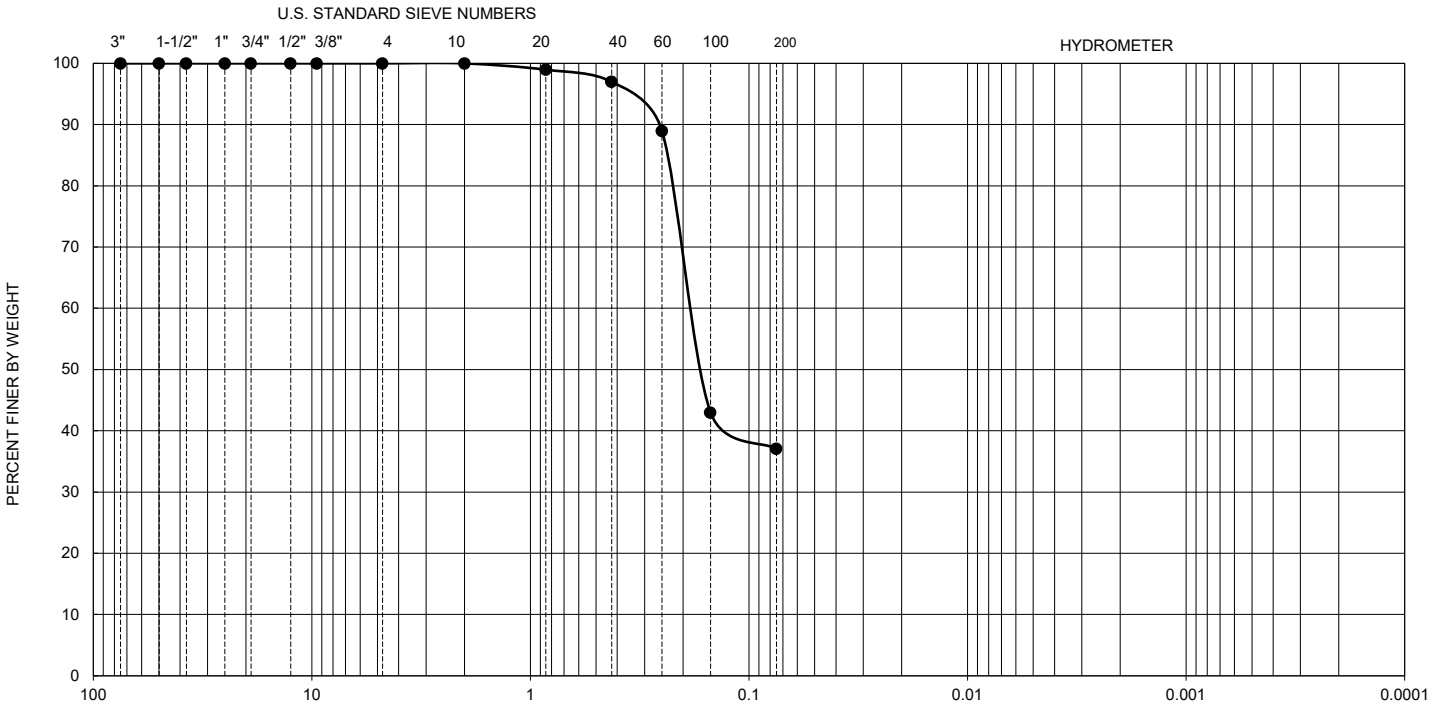
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-9

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S15	60-61.5	37.1	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	99
No. 40	0.425 mm	97
No. 60	0.25 mm	89
No 100	0.15 mm	43
No 200	.075 mm	37.1

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Checked by:	J.B	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

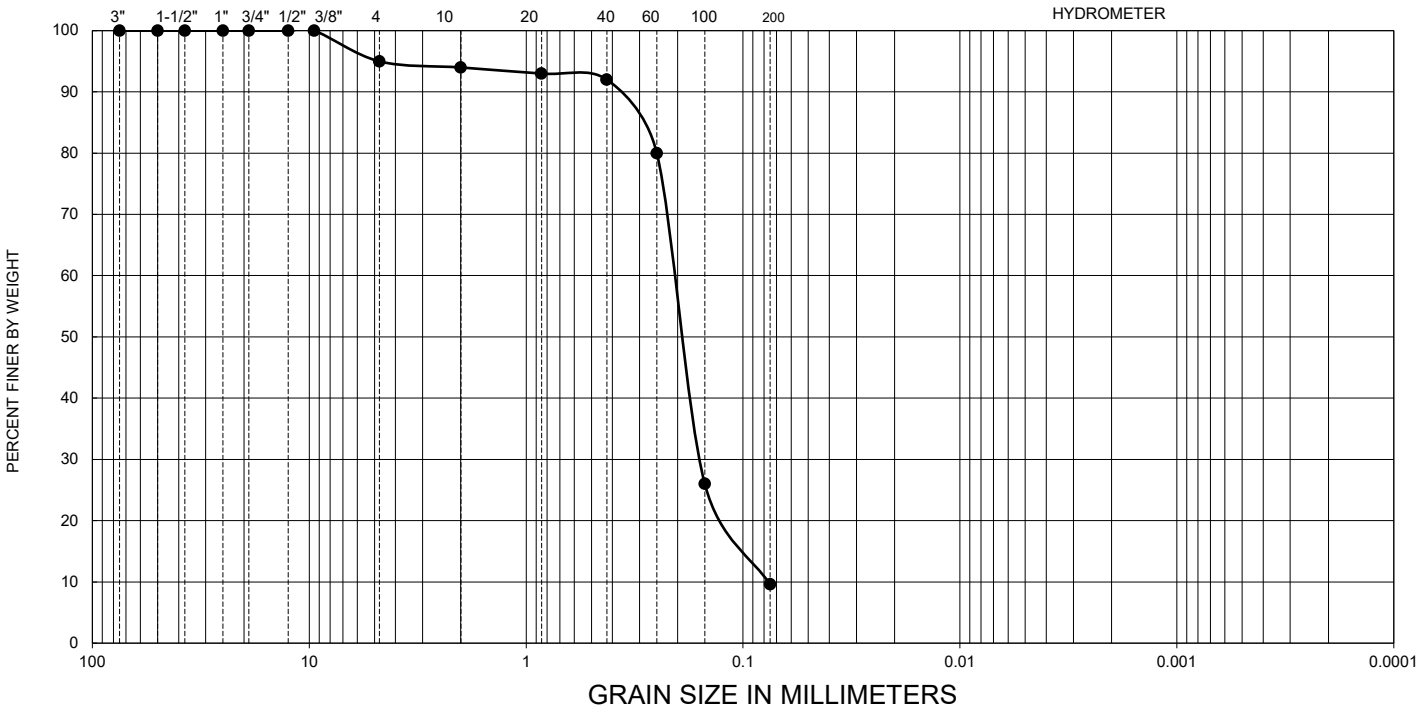
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-10

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S17	70-71.5	9.6	SP-SM

Sample Description	Dark gray Poorly graded sand with silt

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	95
	No. 10	2.0 mm	94
	No. 20	0.85 mm	93
	No. 40	0.425 mm	92
	No. 60	0.25 mm	80
	No 100	0.15 mm	26
	No 200	.075 mm	9.6

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Checked by:	J.B.	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

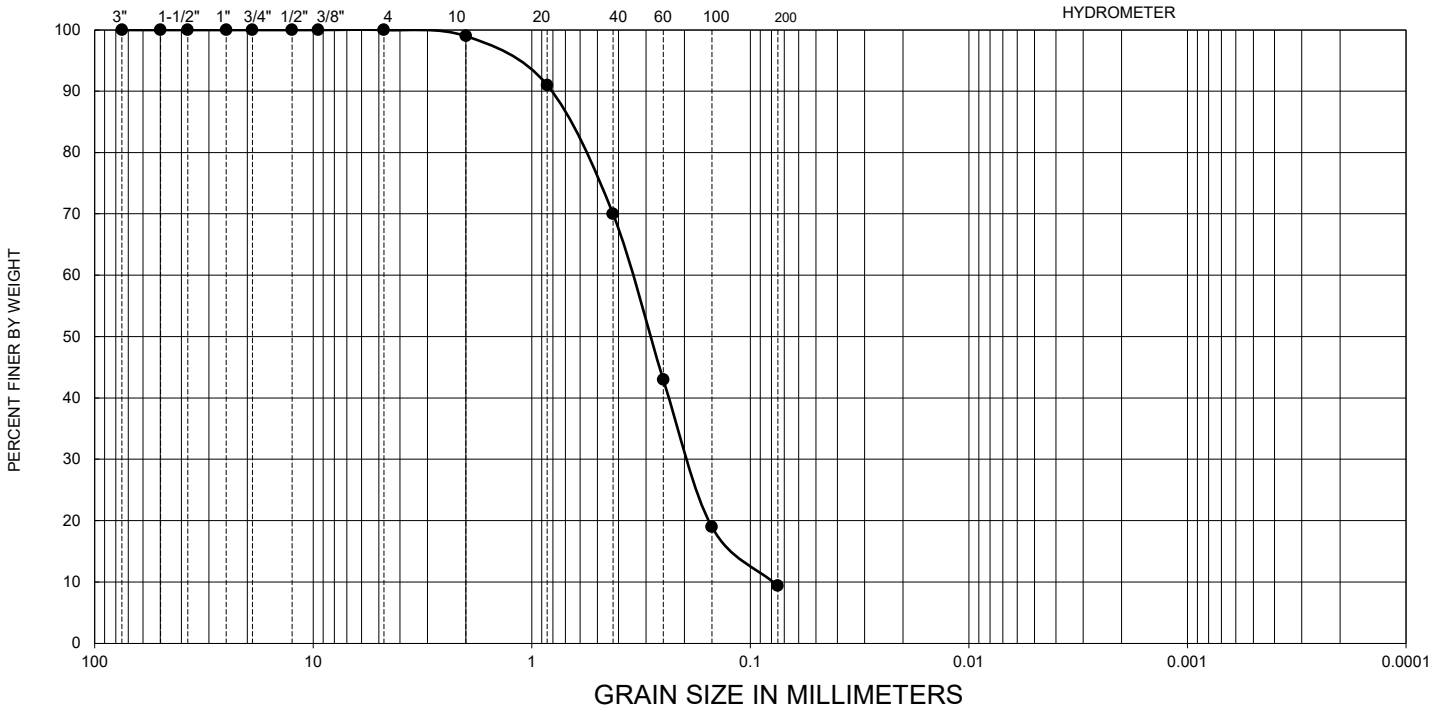
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-11

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S19	80-81.5	9.4	SP-SM

Sample Description	Dark gray Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	99
No. 20	0.85 mm	91
No. 40	0.425 mm	70
No. 60	0.25 mm	43
No 100	0.15 mm	19
No 200	.075 mm	9.4

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Checked by:	J.B.	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

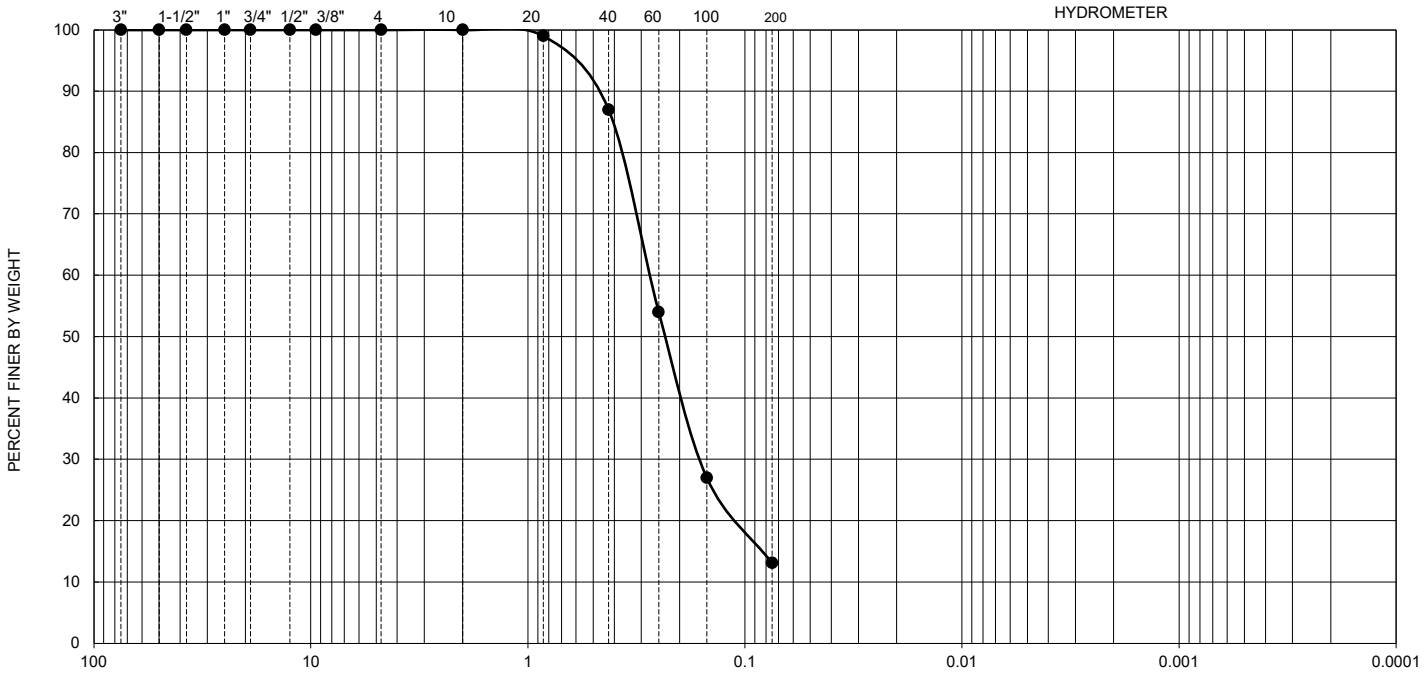
FIGURE

C-12

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

U.S. STANDARD SIEVE NUMBERS



GRAIN SIZE IN MILLIMETERS

Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S27	120-121.5	13.1	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	99
No. 40	0.425 mm	87
No. 60	0.25 mm	54
No 100	0.15 mm	27
No 200	.075 mm	13.1

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GRADATION TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

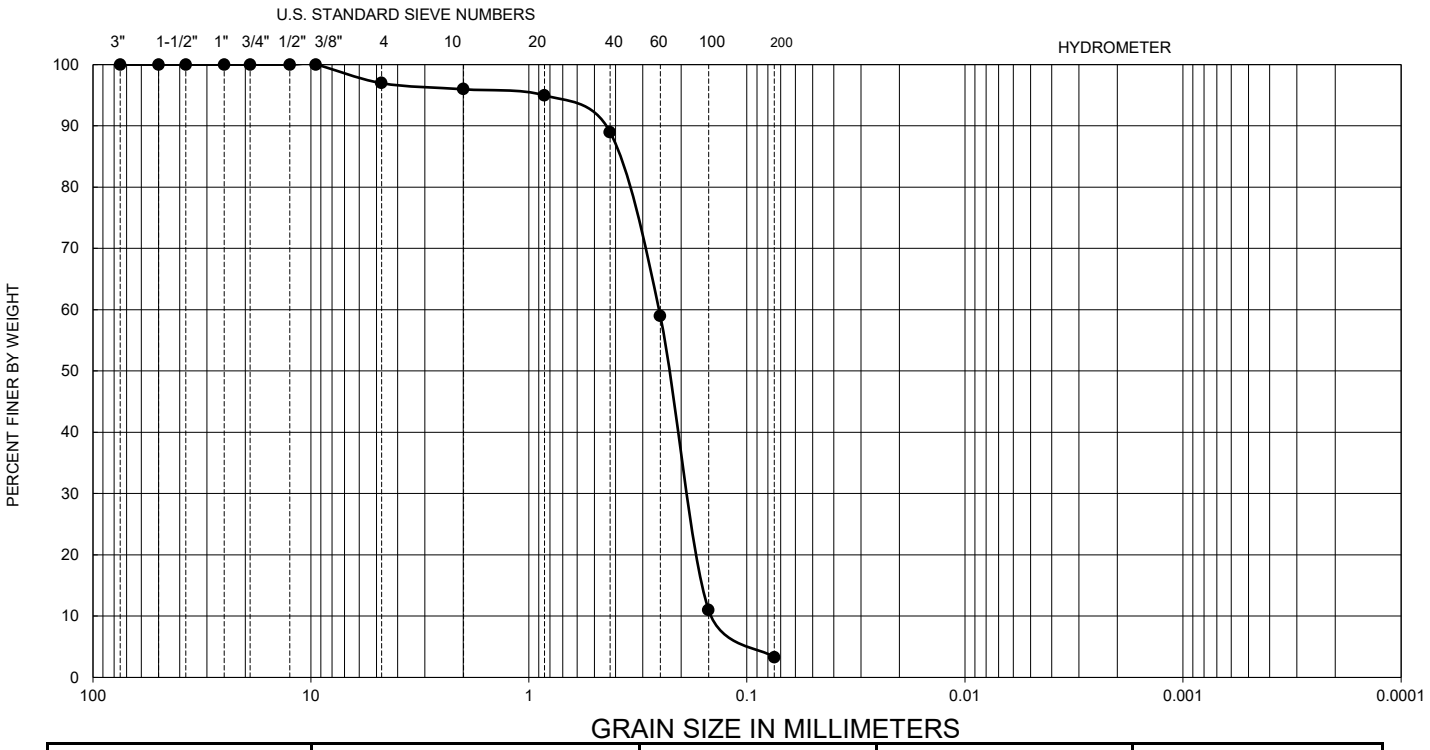
FIGURE

C-13

Checked by:	J.B.	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S1	0.5-4	3.3	SP

Sample Description	Brown Poorly graded sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	97
No. 10	2.0 mm	96
No. 20	0.85 mm	95
No. 40	0.425 mm	89
No. 60	0.25 mm	59
No 100	0.15 mm	11
No 200	.075 mm	3.3

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

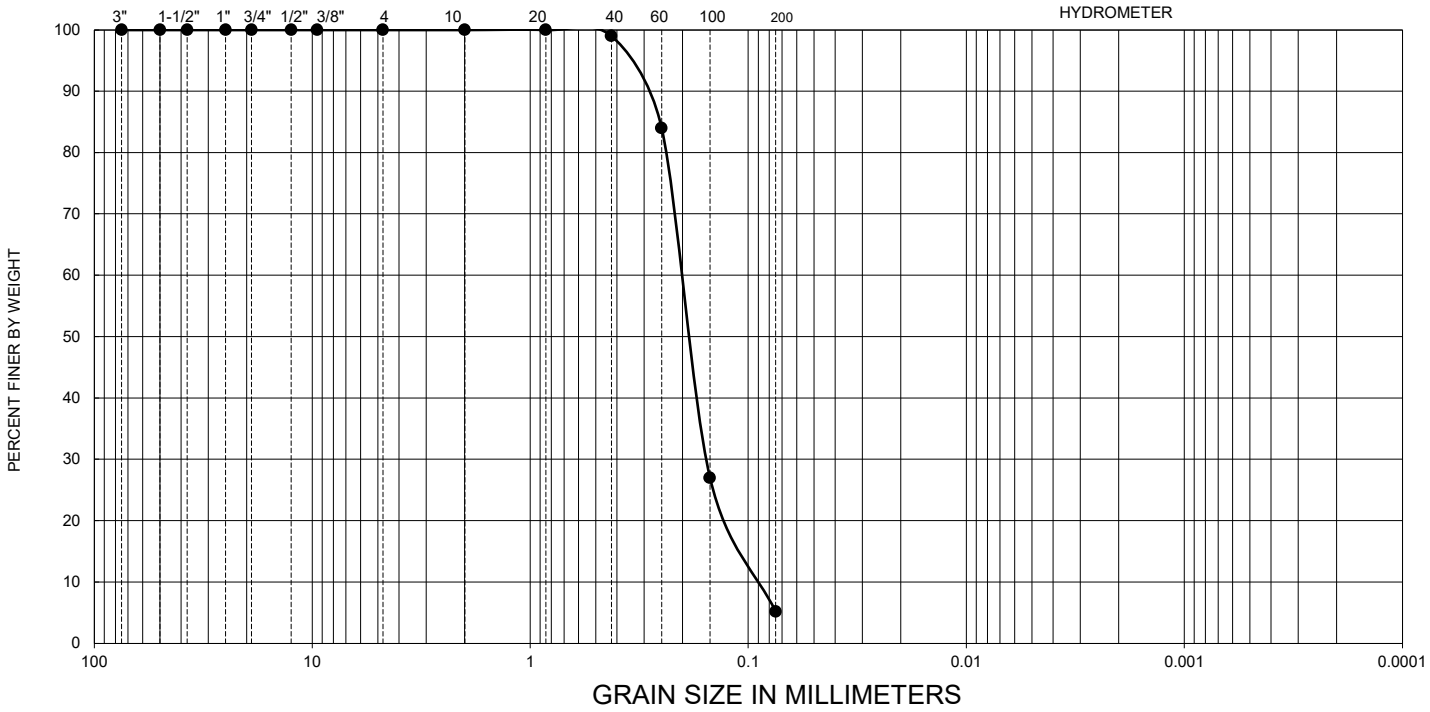
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-14

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S5	11-12.5	5.2	SP-SM

Sample Description	Dark gray Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	100
No. 40	0.425 mm	99
No. 60	0.25 mm	84
No 100	0.15 mm	27
No 200	.075 mm	5.2

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

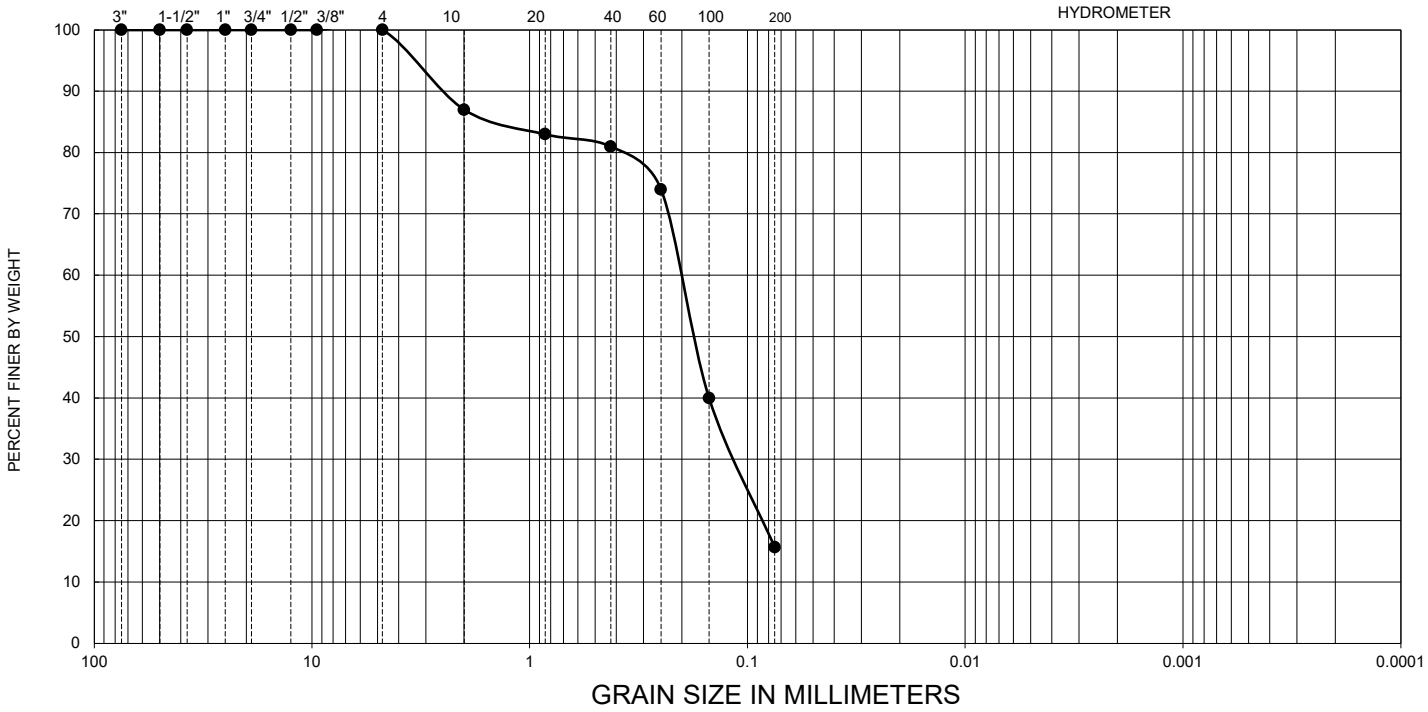
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-15

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S9	21-22.5	15.7	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	87
No. 20	0.85 mm	83
No. 40	0.425 mm	81
No. 60	0.25 mm	74
No 100	0.15 mm	40
No 200	.075 mm	15.7

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

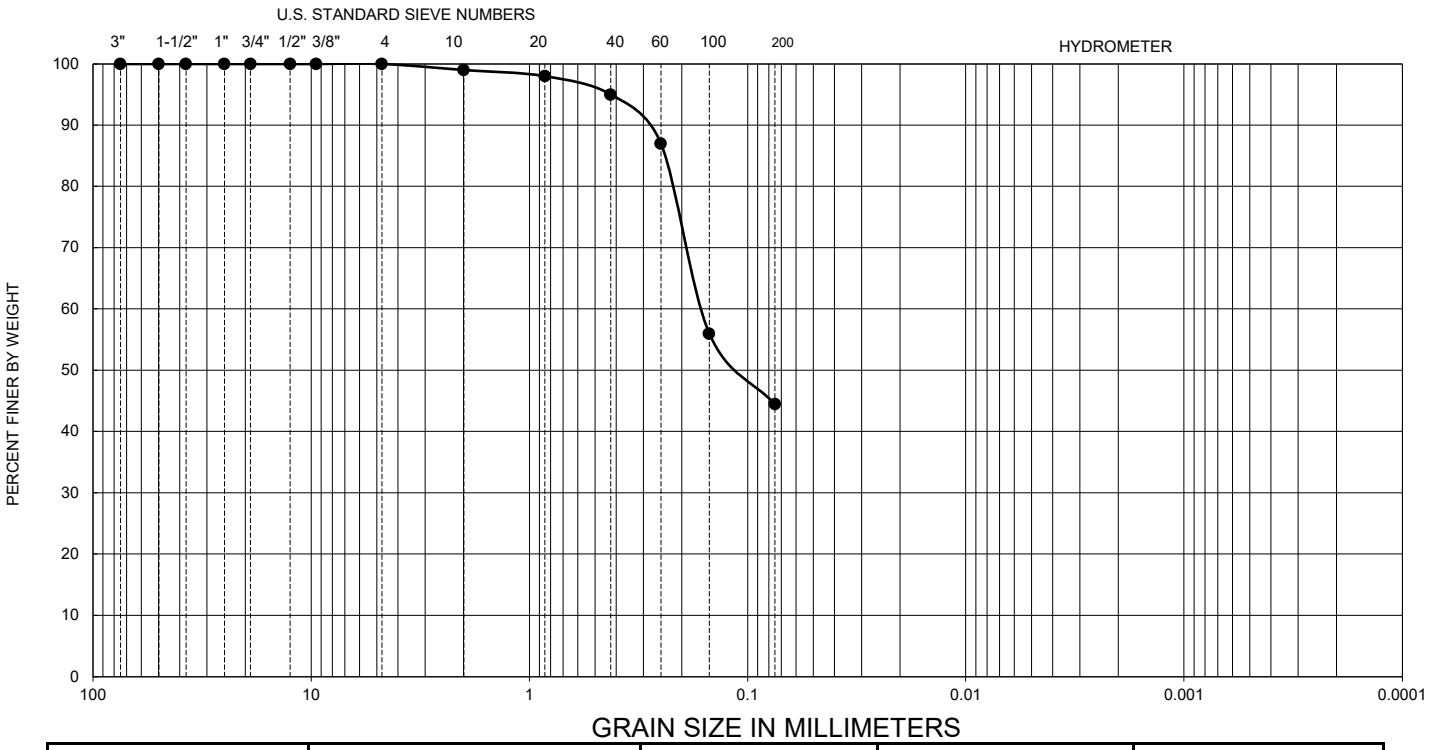
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-16

Date Tested: **3/12/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S13	40-41.5	44.5	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	99
No. 20	0.85 mm	98
No. 40	0.425 mm	95
No. 60	0.25 mm	87
No 100	0.15 mm	56
No 200	.075 mm	44.5

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Project No.	20180876.001A	Date:	2-Apr-20

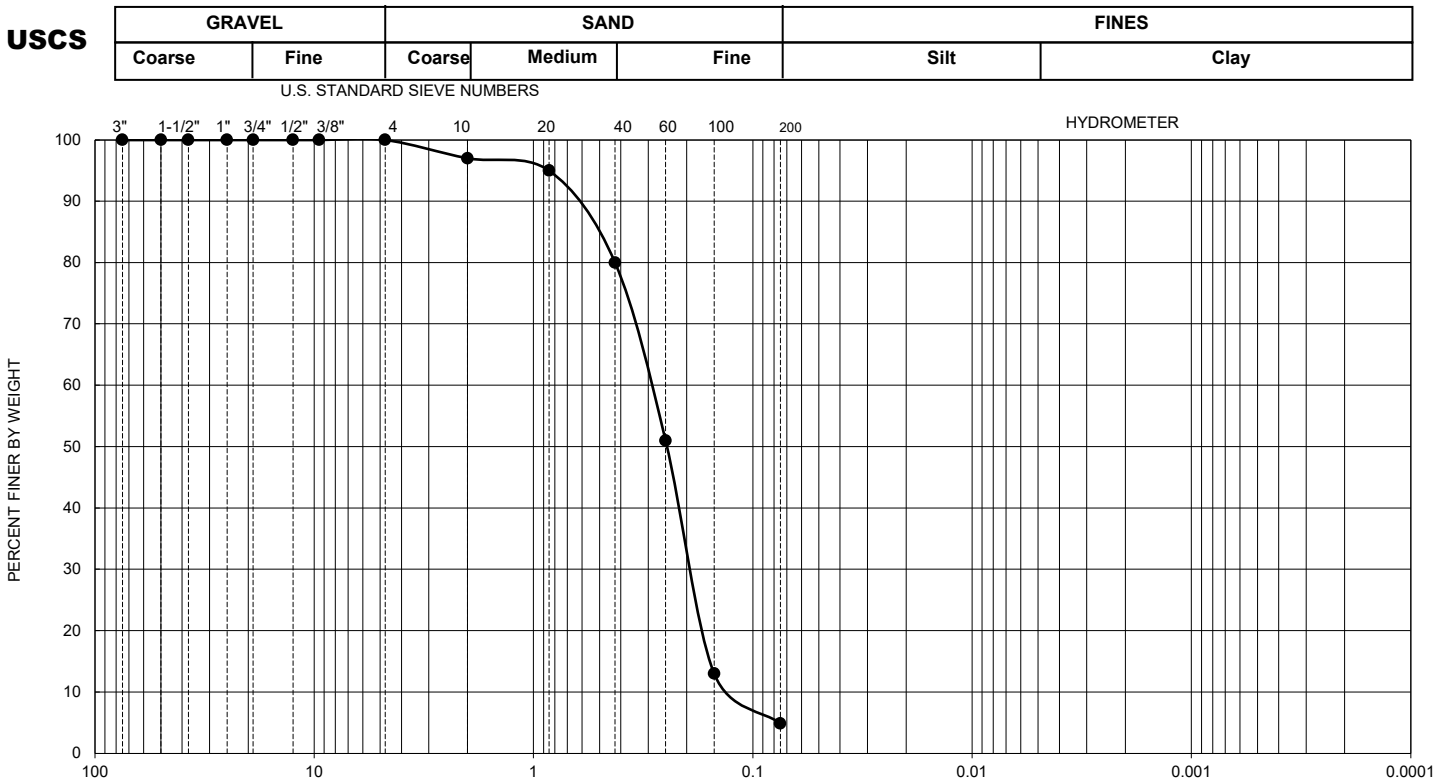
GRADATION TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-17

Date Tested: **3/12/2020**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S15	50-51.5	4.9	SP

Sample Description	Dark gray Poorly graded sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	97
No. 20	0.85 mm	95
No. 40	0.425 mm	80
No. 60	0.25 mm	51
No 100	0.15 mm	13
No 200	.075 mm	4.9

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Project No.	20180876.001A	Date:	2-Apr-20

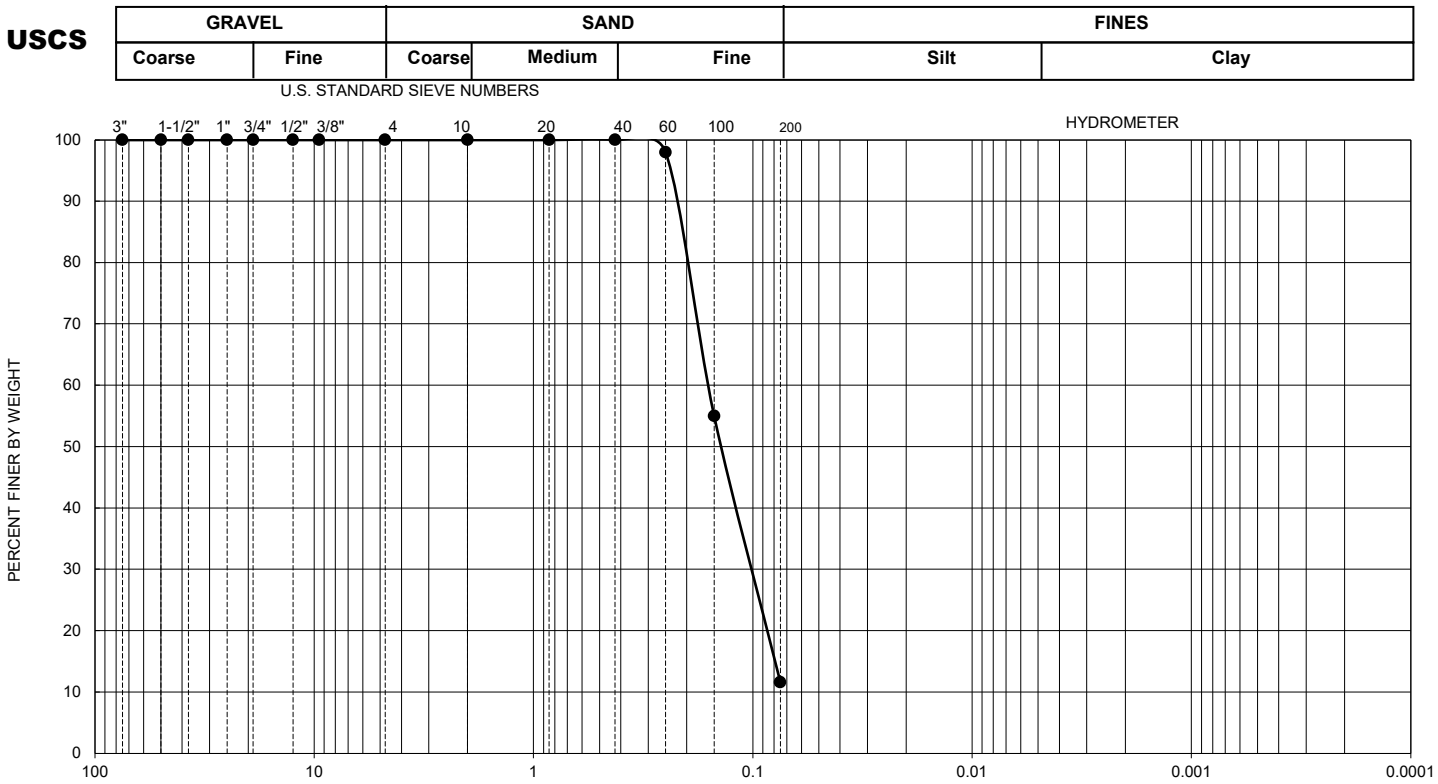
GRADATION TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-18

Date Tested: **3/12/2020**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S19	70-71.5	11.6	SP-SM

Sample Description	Dark gray Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	100
No. 40	0.425 mm	100
No. 60	0.25 mm	98
No 100	0.15 mm	55
No 200	.075 mm	11.6

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

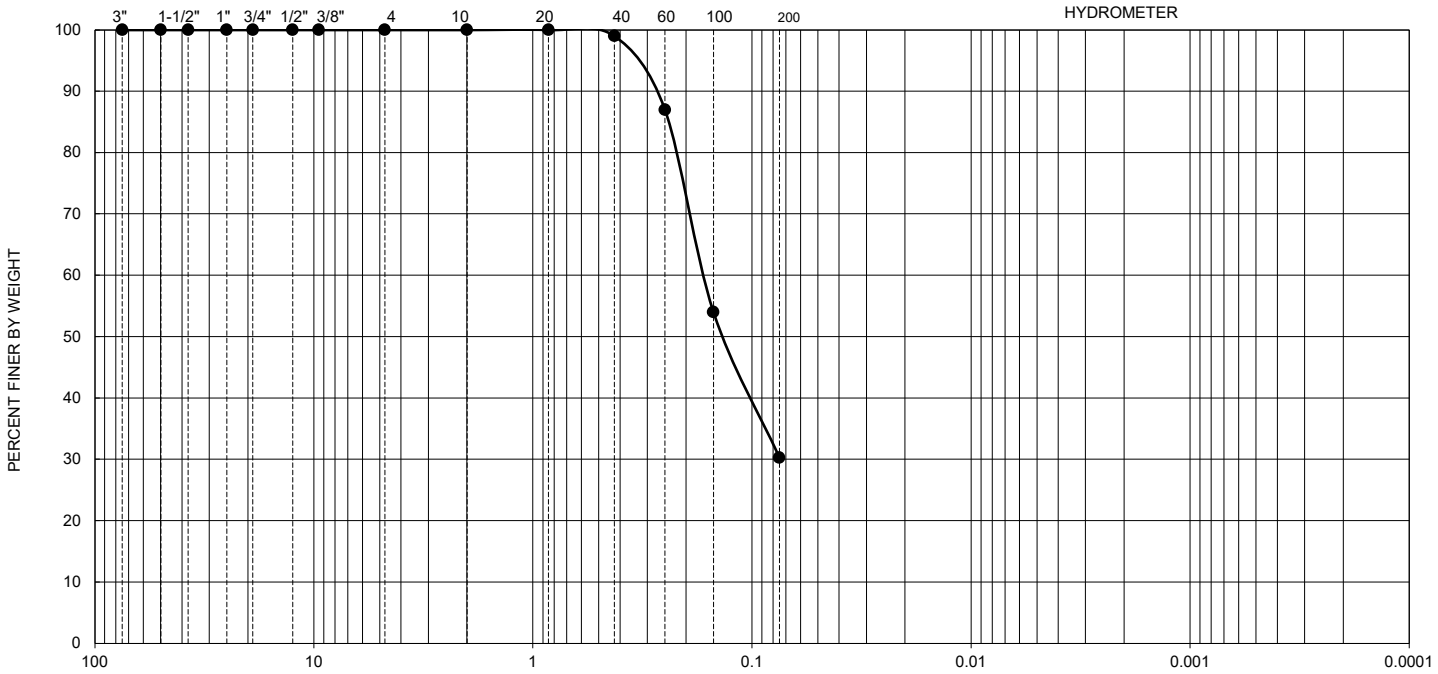
FIGURE

C-19

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

U.S. STANDARD SIEVE NUMBERS



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S25	100-101.5	30.3	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	100
No. 40	0.425 mm	99
No. 60	0.25 mm	87
No 100	0.15 mm	54
No 200	.075 mm	30.3

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

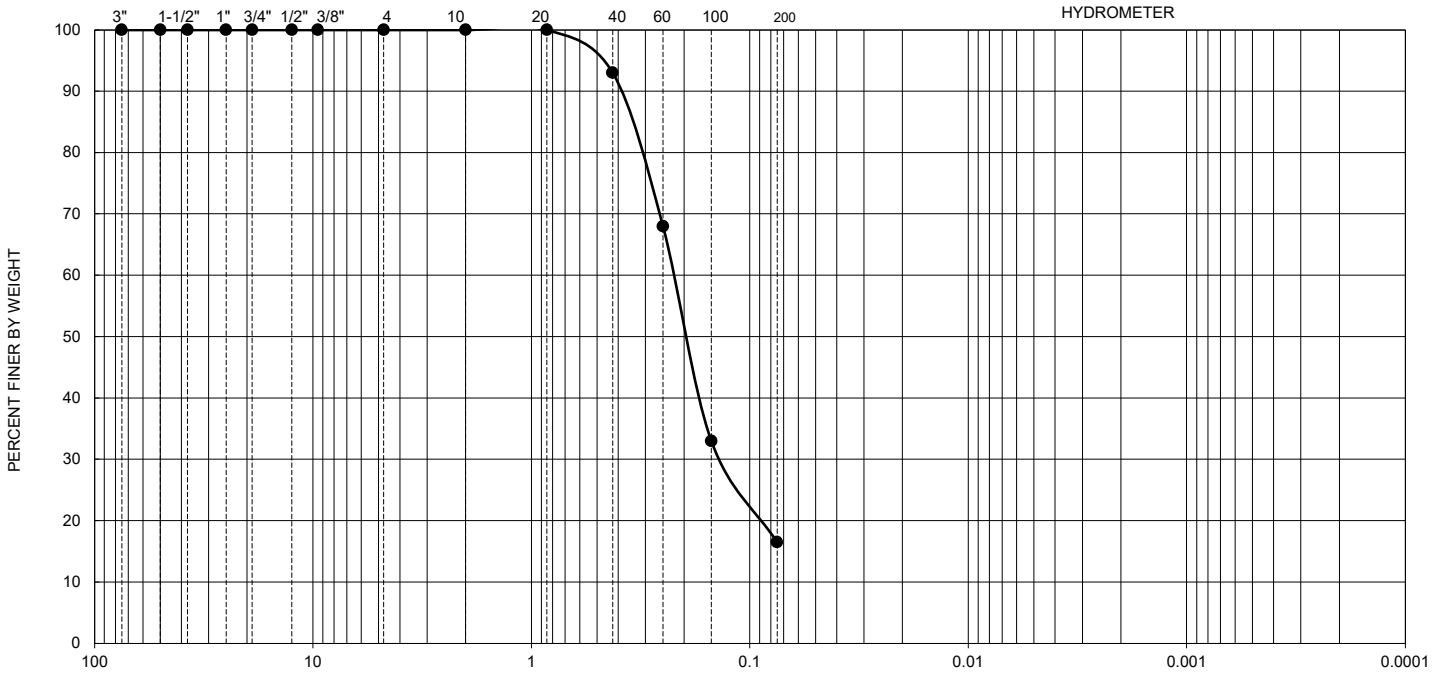
FIGURE

C-20

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

U.S. STANDARD SIEVE NUMBERS



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S27	110-111.5	16.5	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	100
No. 40	0.425 mm	93
No. 60	0.25 mm	68
No 100	0.15 mm	33
No 200	.075 mm	16.5

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

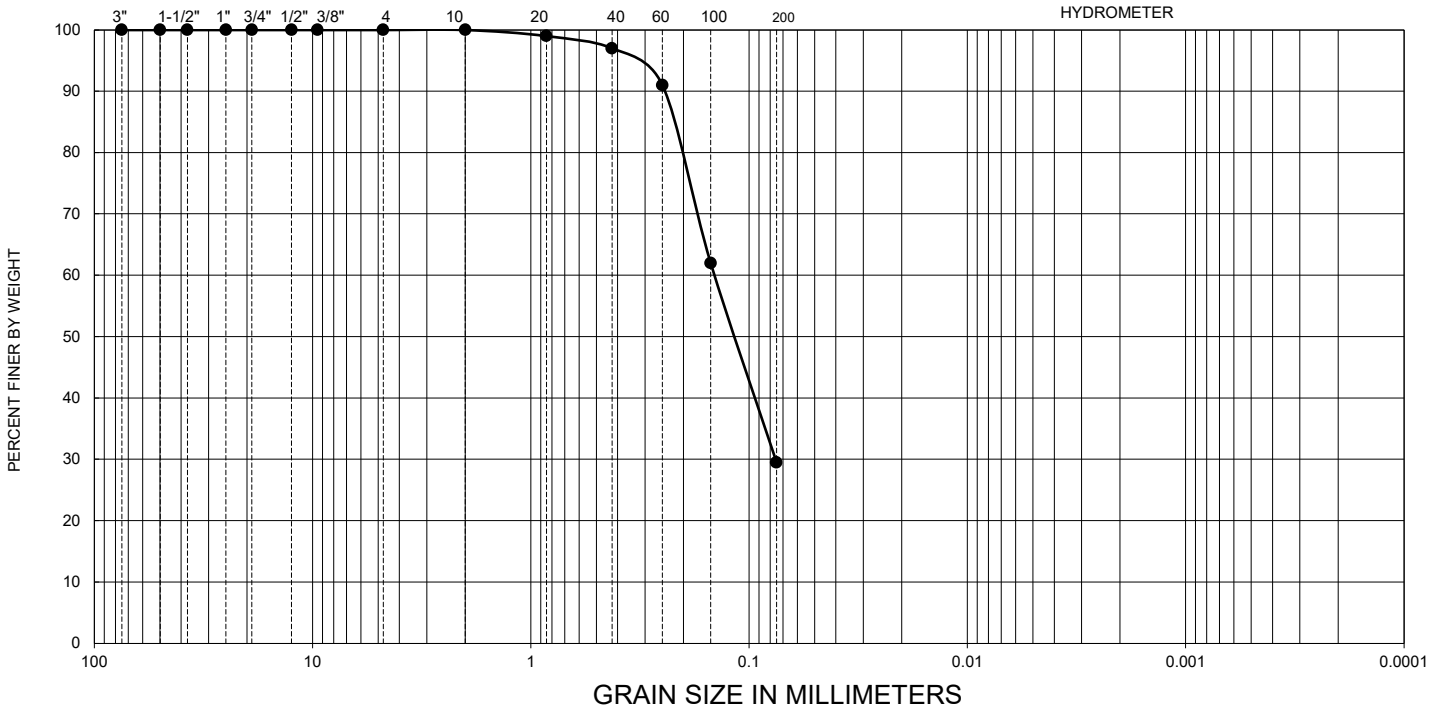
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-21

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	30	125-126.5	29.5	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	99
No. 40	0.425 mm	97
No. 60	0.25 mm	91
No 100	0.15 mm	62
No 200	.075 mm	29.5

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

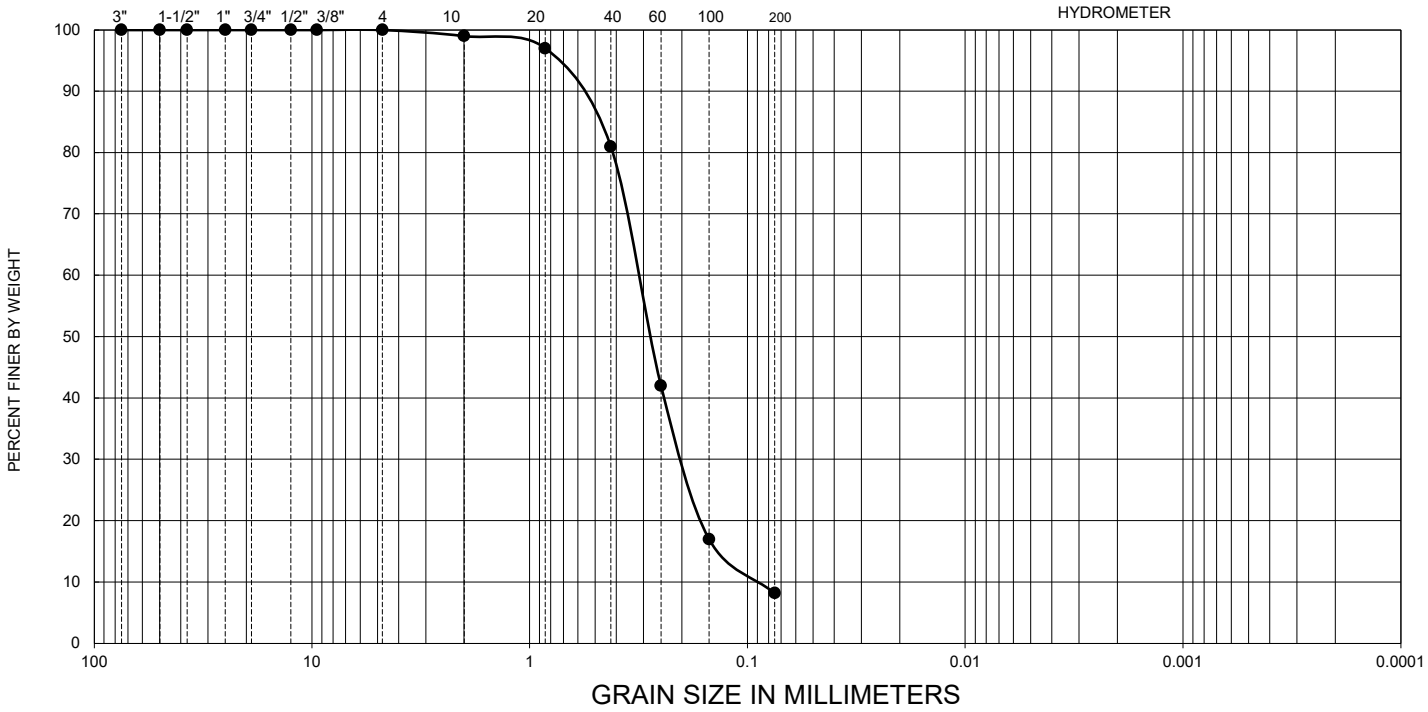
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-22

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	35	150-151.5	8.2	SP-SM

Sample Description	Dark gray Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	99
No. 20	0.85 mm	97
No. 40	0.425 mm	81
No. 60	0.25 mm	42
No 100	0.15 mm	17
No 200	.075 mm	8.2

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

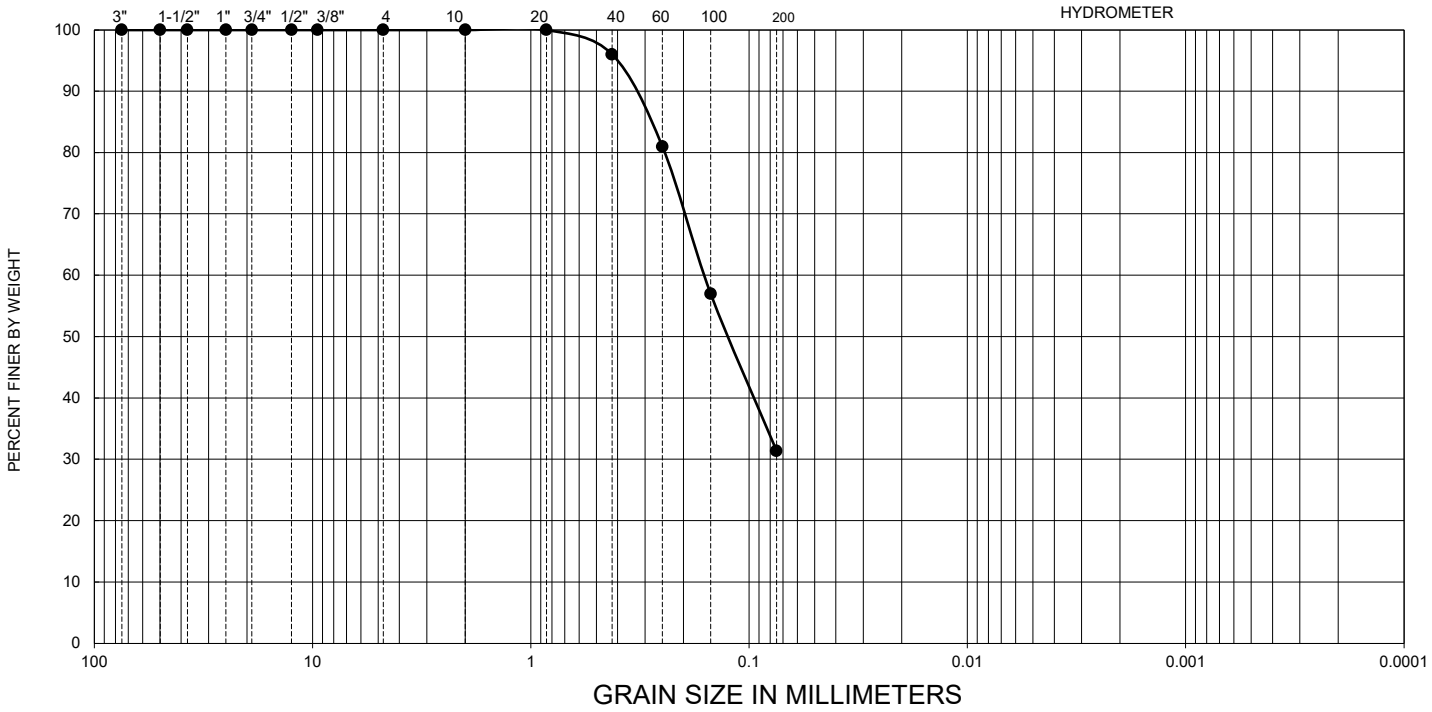
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-23

Date Tested: **3/12/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	37	170-171.5	31.4	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	100
No. 40	0.425 mm	96
No. 60	0.25 mm	81
No 100	0.15 mm	57
No 200	.075 mm	31.4

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

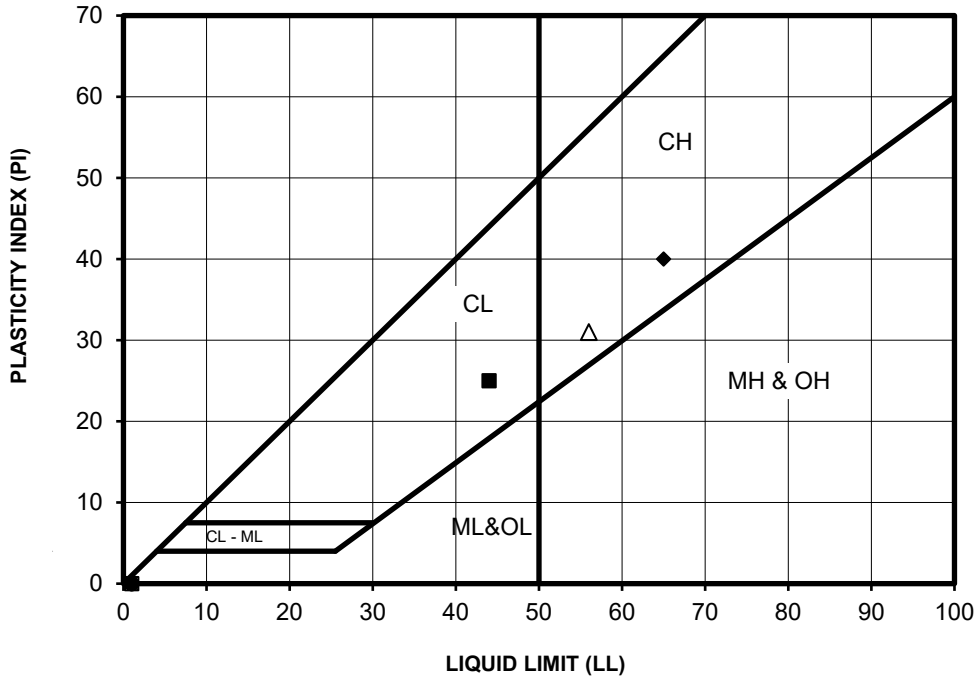
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-24

Date Tested: 3/12/2020 to 3/24/2020

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	R-20-001/S5	12-13.5	NP	NP	NP	ML	SP-SM
■	R-20-001/S11	30-31.5	44	19	25	CL	CL
◆	R-20-001/S12	35-36.5	65	25	40	CH	CH
○	R-20-001/S15	60-61.5	NP	NP	NP	ML	SM
□	R-20-001/S18	75-76.5	NP	NP	NP	ML	SP-SM
△	R-20-001/S31	150-151	56	25	31	CH	CH
+	R-20-002/S3	7-8.5	NP	NP	NP	ML	SM
◇	R-20-002/S9	21-22.5	NP	NP	NP	ML	SP-SM



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ATTERBERG LIMITS TEST RESULTS

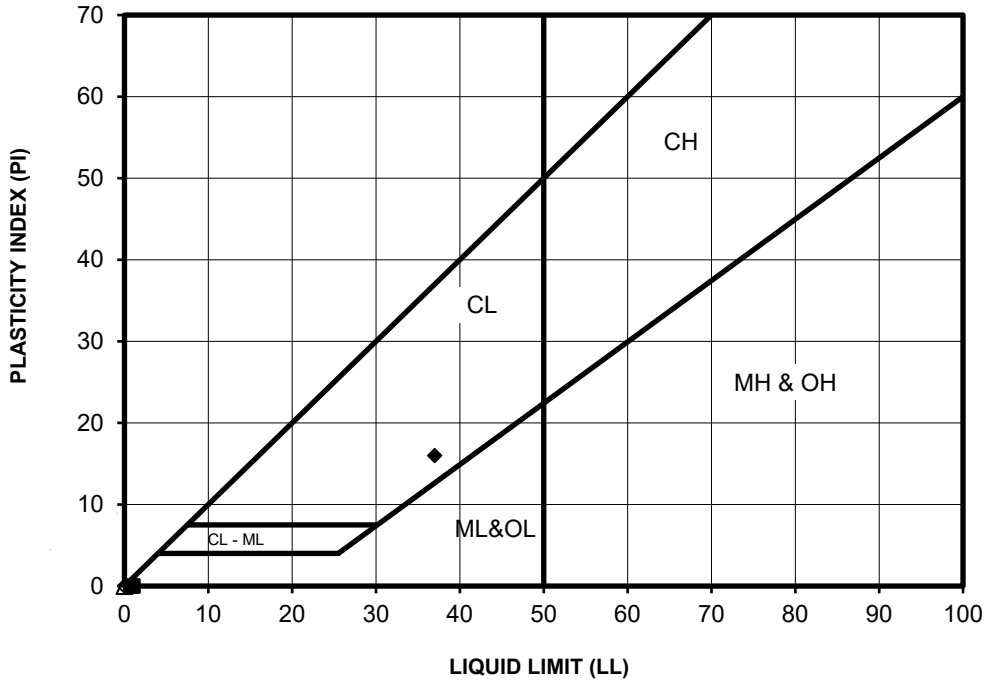
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE
C-25

Checked by	J.B.	TECH	UP/TC/RH
PROJECT NO:	20180876.001A	2-Apr-20	

Date Tested: 3/16/2020 to 3/18/2020

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	R-20-002/S15	50-51.5	NP	NP	NP	ML	SP
■	R-20-002/S21	80-81.5	NP	NP	NP	ML	SM
◆	R-20-002/S23	90-91.5	37	21	16	CL	CL
○	R-20-002/S27	110-111.5	NP	NP	NP	ML	SM
□	R-20-002/S33	140-141.5	NP	NP	NP	ML	SM



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ATTERBERG LIMITS TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

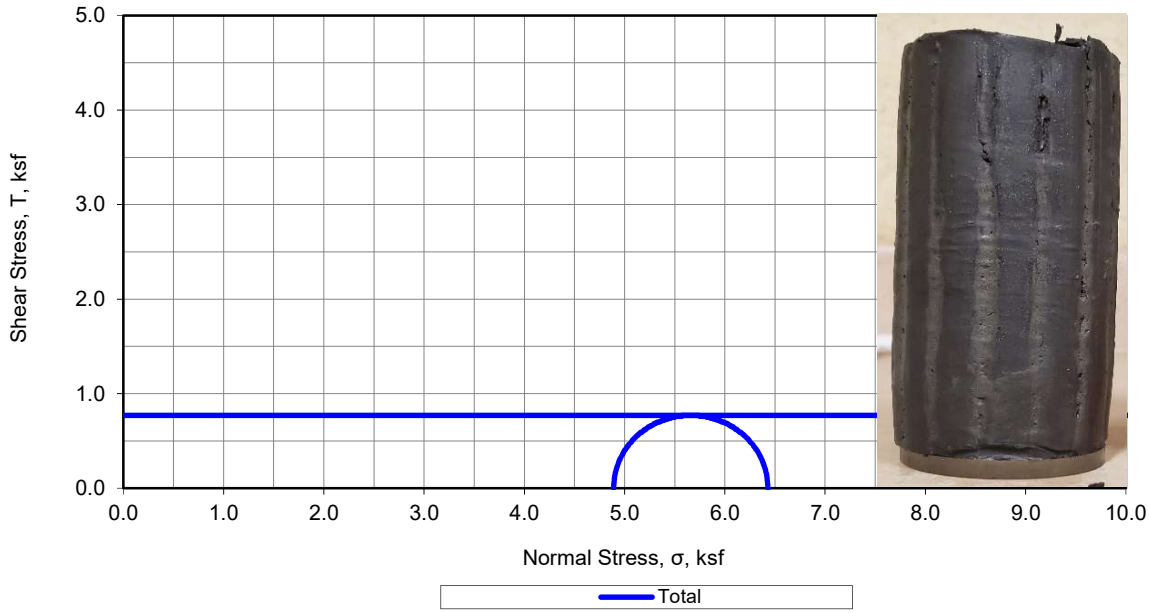
FIGURE

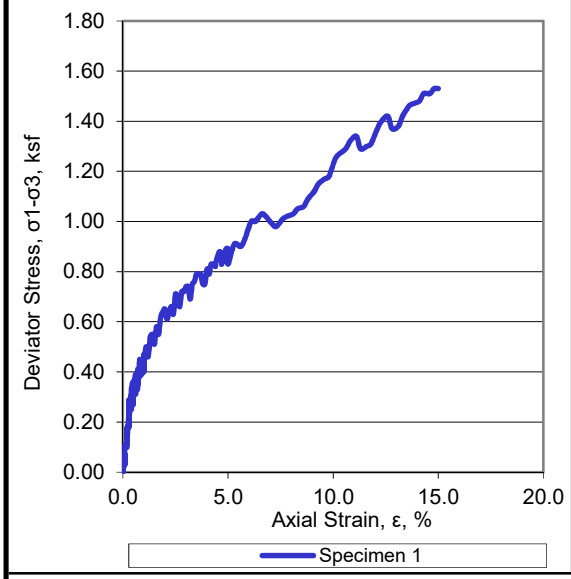
C-26

Checked by	J.B	TECH	UP/TC/RH
PROJECT NO:	20180876.001A	2-Apr-20	

Total	
c = 0.77	ksf

Specimen Shear Picture





Specimen No.			1
Initial	Diameter, in	D_O	2.40
	Height, in	H_O	5.49
	Water Content, %	ω_O	46.5
	Dry Density, lbs/ft^3	$^{\gamma}d_o$	76.6
	Saturation, %	S_O	106
	Void Ratio	e_O	1.159
Minor Principal Stress, ksf		σ_3	4.90
Maximum Deviator Stress, ksf		$(\sigma 1-\sigma 3)_{max}$	1.53
Time to $(\sigma_1-\sigma_3)_{max}$, min		t_f	14.85
Deviator Stress @ 15% Axial Strain, ksf		$(\sigma_1-\sigma_3)_{15\%}$	1.53
Ultimate Deviator Stress, ksf		$(\sigma_1-\sigma_3)_{ult}$	na
Rate of strain, %/min		$'\varepsilon$	1.00
Axial Strain at Failure, %		ε_f	14.85

Description of Specimen: Black Fat Clay (CH)

Amount of Material Finer than the No. 200, %: 88

LL:	PL:	PI:	G_S:	Specimen Type:	Test Method:
56	24	32	2.65 Assumed	Undisturbed	ASTM D2850

Membrane correction applied

Boring:	R-20-001
Sample:	S21
Depth, ft:	91.0
Test Date:	3/16/20

Remarks: nm= not measured, na = not applicable

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Bright People. Right Solutions.
2601 Barrington Ct, Hayward, CA 94545

Project No.:	20180876.001A
Date:	3/20/20
Entry By:	CP
Checked By:	CP
File Name:	HL12966

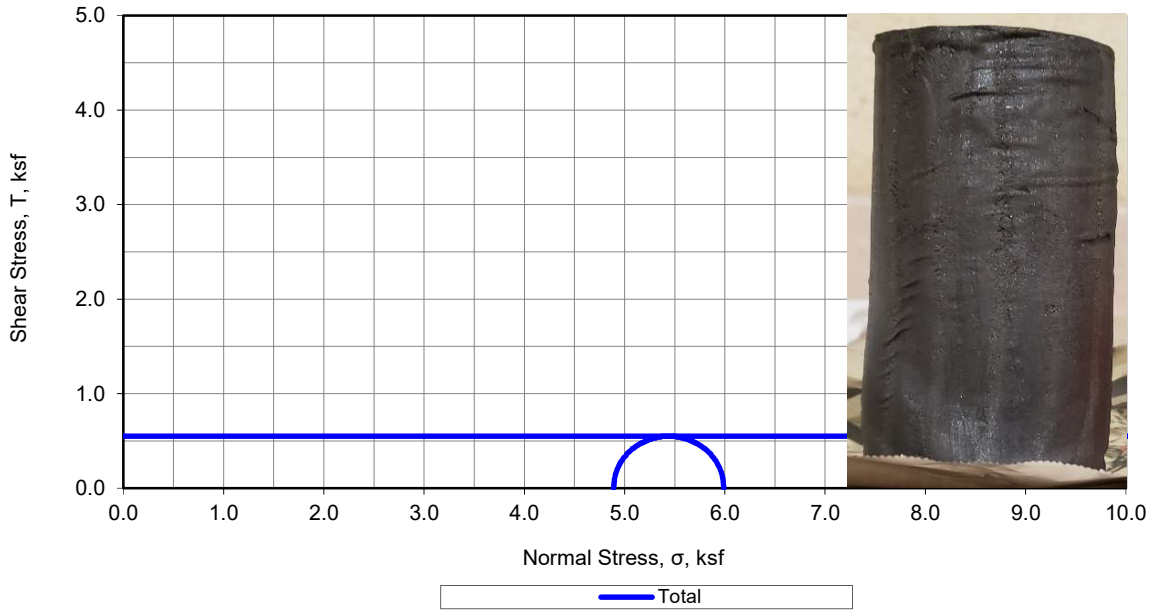
TRIAXIAL COMPRESSION TEST (UU)

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

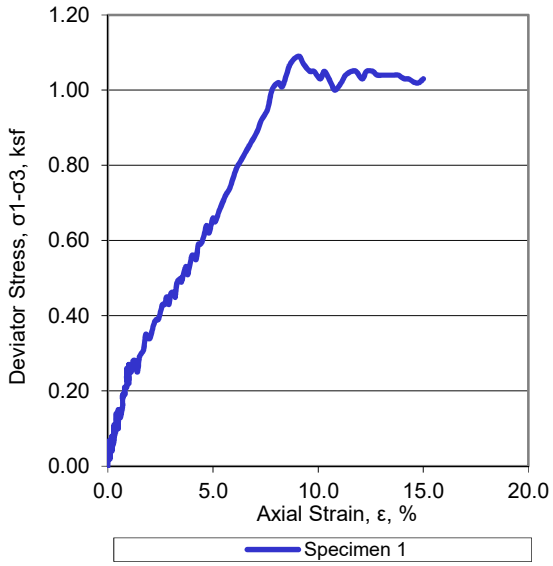
Figure

C-27

Total	
c = 0.55	ksf



Specimen Shear Picture



Specimen No.			1
Initial	Diameter, in	D_O	2.39
	Height, in	H_O	5.38
	Water Content, %	ω_O	48.2
	Dry Density, lbs/ft^3	$^{\gamma}d_o$	73.8
	Saturation, %	S_O	103
	Void Ratio	e_O	1.240
Minor Principal Stress, ksf		σ_3	4.90
Maximum Deviator Stress, ksf		$(\sigma 1-\sigma 3)_{max}$	1.09
Time to $(\sigma_1-\sigma_3)_{max}$, min		t_f	9.08
Deviator Stress @ 15% Axial Strain, ksf		$(\sigma_1-\sigma_3)_{15\%}$	1.03
Ultimate Deviator Stress, ksf		$(\sigma_1-\sigma_3)_{ult}$	na
Rate of strain, %/min		'ε	1.00
Axial Strain at Failure, %		ε_f	9.08

Description of Specimen: Black Silt (ML)

Amount of Material Finer than the No. 200, %: nm

LL:	PL:	PI:	G_S:	Specimen Type:	Test Method:
nm	nm	nm	2.65 Assumed	Undisturbed	ASTM D2850

Membrane correction applied

Boring:	R-20-002
Sample:	S22
Depth, ft:	85.5
Test Date:	3/16/20

Remarks: nm= not measured, na = not applicable

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2601 Barrington Ct, Hayward, CA 94545

Project No.:	20180876.001A
Date:	3/20/20
Entry By:	CP
Checked By:	CP
File Name:	HL12966

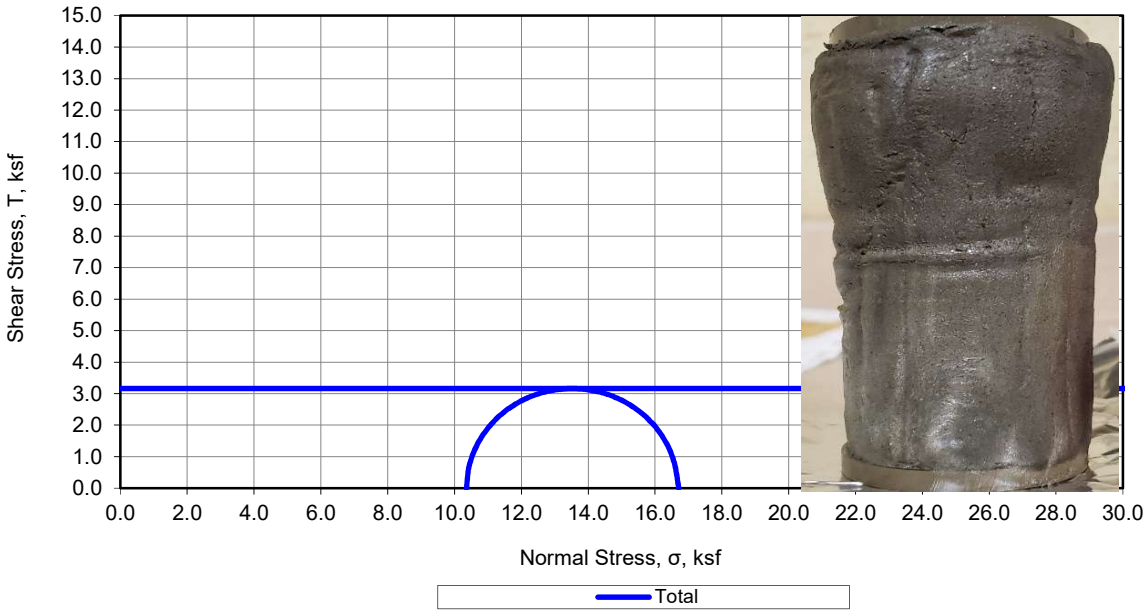
TRIAXIAL COMPRESSION TEST (UU)

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

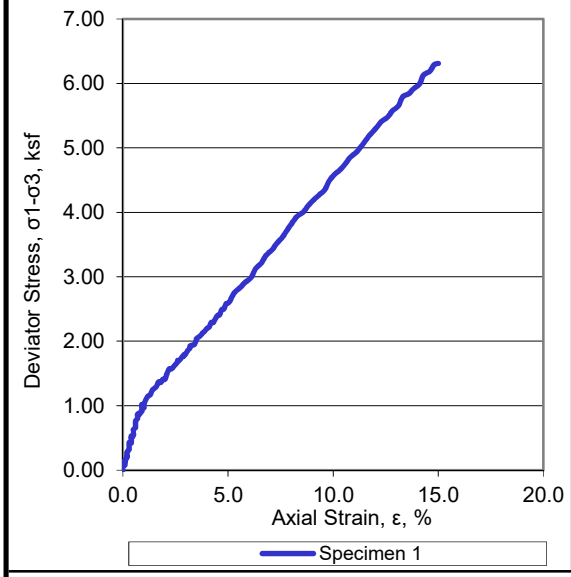
Figure

C-28

Total	
c = 3.16	ksf



Specimen Shear Picture



Specimen No.			1
Initial	Diameter, in	D_O	2.38
	Height, in	H_O	4.79
	Water Content, %	ω_O	24.1
	Dry Density, lbs/ft^3	$^{\gamma}d_o$	104.6
	Saturation, %	S_O	110
	Void Ratio	e_O	0.581
Minor Principal Stress, ksf		σ_3	10.37
Maximum Deviator Stress, ksf		$(\sigma 1-\sigma 3)_{max}$	6.31
Time to $(\sigma_1-\sigma_3)_{max}$, min		t_f	15.02
Deviator Stress @ 15% Axial Strain, ksf		$(\sigma_1-\sigma_3)_{15\%}$	6.31
Ultimate Deviator Stress, ksf		$(\sigma_1-\sigma_3)_{ult}$	na
Rate of strain, %/min		$'\varepsilon$	1.00
Axial Strain at Failure, %		ε_f	15.02

Description of Specimen: Black Slity Clay with Sand (CL-ML)

Amount of Material Finer than the No. 200, %: nm

LL:	PL:	PI:	G_S:	Specimen Type:	Test Method:
26	19	7	2.65 Assumed	Undisturbed	ASTM D2850

Membrane correction applied

Boring:	R-20-002
Sample:	S38
Depth, ft:	180.5
Test Date:	3/16/20

Remarks: nm= not measured, na = not applicable

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2601 Barrington Ct, Hayward, CA 94545

Project No.:	20180876.001A
Date:	3/20/20
Entry By:	CP
Checked By:	CP
File Name:	HL12966

TRIAXIAL COMPRESSION TEST (UU)

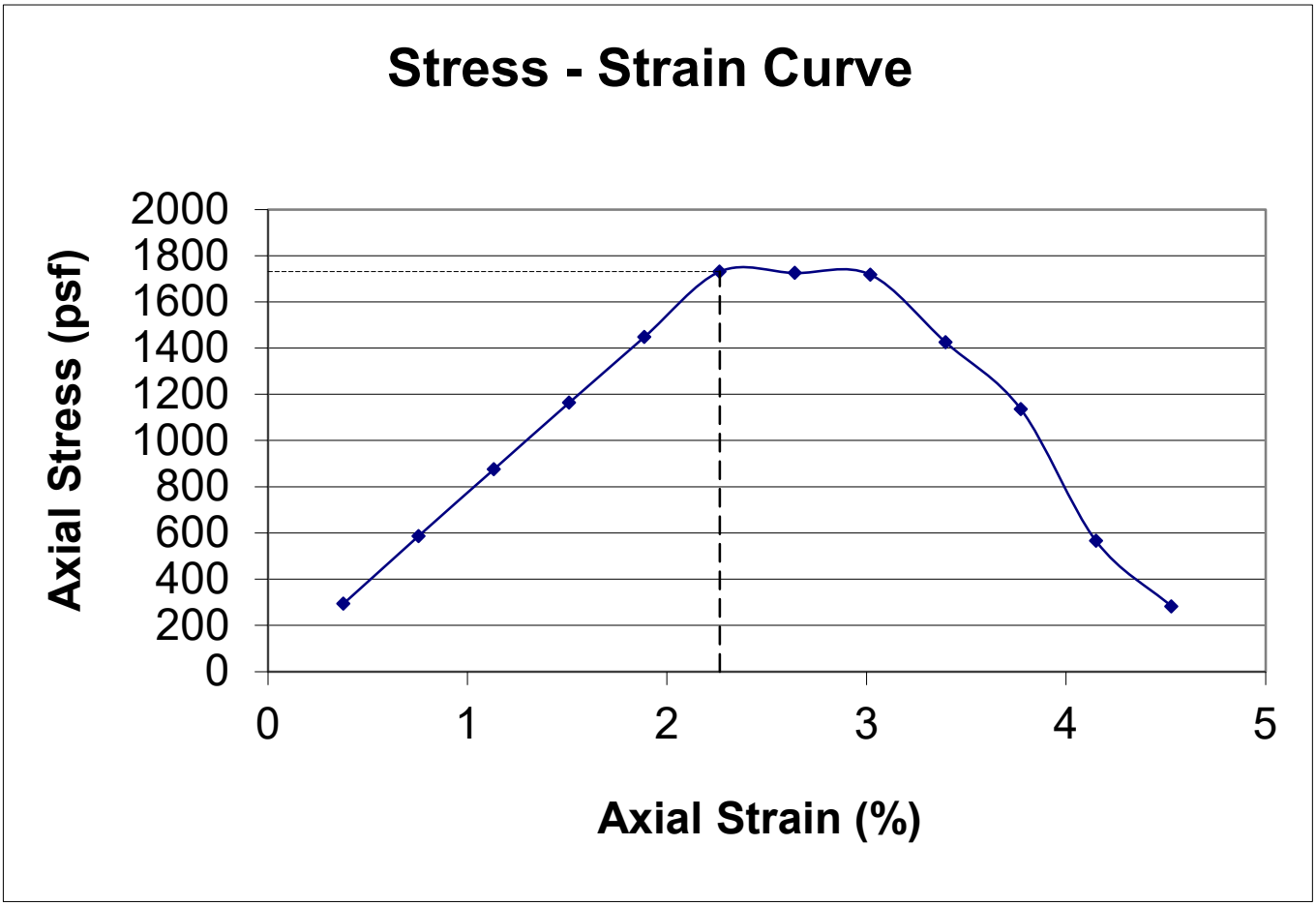
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

Figure

C-29

Sample Information			
Boring No.	R-20-002	Sample No.	24
Depth	95-96 ft		
Description	Dark gray silty sand		

Unit Weight	Diameter	2.42	in
	Length	5.3	in
	Wet Wt.	774.6	g
Moisture Content	Wet Wt.	410.9	
	Dry Wt.	320.8	
	Moisture	28.1%	
Wet Unit Weight	(pcf)	121.0	
Dry Unit Weight	(pcf)	94.5	



Unconfined Compressive Strength (psf) = **1731**

Unconfined Shear Strength (psf) = **865**

Loading Rate : 1%/min

Date Tested 3/25/2020

Performed in General Accordance with ASTM D2166

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Bright People. Right Solutions.

CHECKED BY :	J.B.	TECH:	Uly P.
PROJECT NO:	20180876.001A	DATE:	2-Apr-20

UNCONFINED COMPRESSION TEST

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

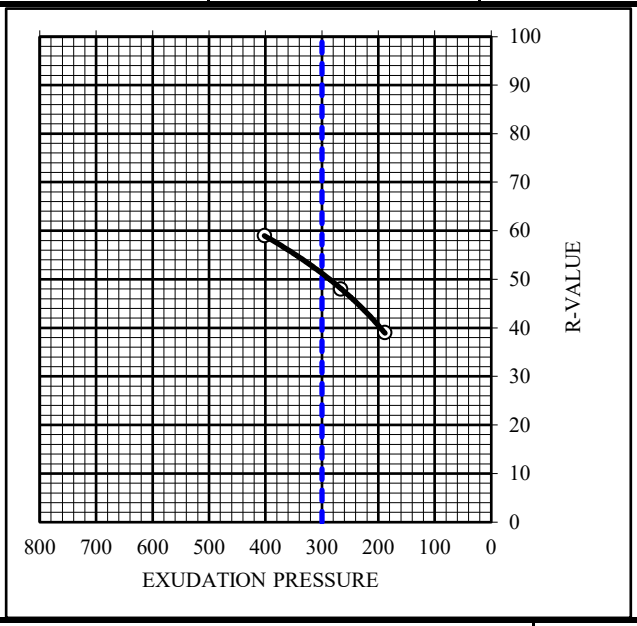
C-30

Boring No.	Sample No.	Depth	Description	Date Tested
R-20-001	S-1	0.5'-5'	Brown sand with silt	3/19/2020

TEST SPECIMEN				
MOLD NO.	6	2	9	
FOOT PRESSURE, psi	**280**	**210**	**150**	
INITIAL MOISTURE, %	4.0	4.0	4.0	
"AS-IS" WEIGHT, g	1200	1200	1200	
DRY WEIGHT, g	1154.4	1154.4	1154.4	
WATER ADDED, ml	**120**	**130**	**140**	
COMPACTION MOISTURE, %	14.3	15.2	16.1	
HEIGHT OF BRIQUETTE, in.	**2.5**	**2.49**	**2.48**	
WEIGHT BRIQUETTE/MOLD,	**3088**	**3089.3**	**3088.8**	
WEIGHT OF MOLD, g	**2101.2**	**2107.9**	**2114.6**	
WEIGHT OF BRIQUETTE, g	986.8	981.4	974.2	
DRY DENSITY, pcf	104.7	103.8	102.6	
STABILOMETER, 1000 lbs	**19**	**25**	**38**	
2000lbs	**40**	**55**	**68**	
DISPLACEMENT, in	**5.22**	**5.26**	**5.35**	
EXUDATION LOAD, lbs	**5048**	**3346**	**2368**	
EXUDATION PRESSURE, psi	401.9	266.4	188.5	
R-VALUE	59	48	39	
CORRECTED R-VALUE	59	48	39	
DIAL READING, END	0.0426	0.0275	0.0275	
DIAL READING, START	0.0433	0.0280	0.0286	
DIFFERENCE	-0.0007	-0.0005	-0.0011	
EXPANSION PRESSURE, PS	0.0	0.0	0.0	

INITIAL MOISTURE	
WET WEIGHT, g	323.4
DRY WEIGHT, g	311.1
WEIGHT OF WATER	
WEIGHT OF SAMPLE	
MOISTURE CONTENT %	4.0

R-VALUE:	**51**
Location:	



Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

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R-Value (ASTM D2844)

FIGURE

C-31

Checked By: J.B.	TECH: Uly P.
Job Number: 20180876.001A	DATE: 2-Apr-20

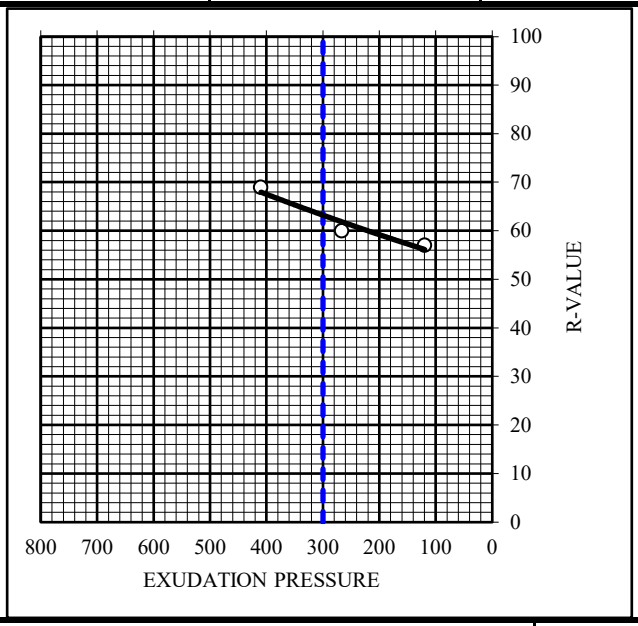
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

Boring No.	Sample No.	Depth	Description	Date Tested
R-20-002	S-1	0.5'-4'	Brown sand with silt	3/19/2020

TEST SPECIMEN				
MOLD NO.	10	5	8	
FOOT PRESSURE, psi	**250**	**210**	**150**	
INITIAL MOISTURE, %	4.3	4.3	4.3	
"AS-IS" WEIGHT, g	1200	1200	1200	
DRY WEIGHT, g	1150.3	1150.3	1150.3	
WATER ADDED, ml	**100**	**130**	**140**	
COMPACTION MOISTURE, %	13.0	15.6	16.5	
HEIGHT OF BRIQUETTE, in.	**2.55**	**2.56**	**2.56**	
WEIGHT BRIQUETTE/MOLD,	**3106.1**	**3112.7**	**3106.4**	
WEIGHT OF MOLD, g	**2109.2**	**2107.9**	**2112.7**	
WEIGHT OF BRIQUETTE, g	996.9	1004.8	993.7	
DRY DENSITY, pcf	104.9	103.0	101.1	
STABILOMETER, 1000 lbs	**14**	**19**	**19**	
2000lbs	**29**	**38**	**43**	
DISPLACEMENT, in	**5.03**	**5.44**	**5.07**	
EXUDATION LOAD, lbs	**5151**	**3346**	**1507**	
EXUDATION PRESSURE, psi	410.1	266.4	120.0	
R-VALUE	69	60	57	
CORRECTED R-VALUE	69	60	57	
DIAL READING, END	0.0295	0.0122	0.0300	
DIAL READING, START	0.0314	0.0126	0.0309	
DIFFERENCE	-0.0019	-0.0004	-0.0009	
EXPANSION PRESSURE, PS	0.0	0.0	0.0	

INITIAL MOISTURE	
WET WEIGHT, g	564.9
DRY WEIGHT, g	541.5
WEIGHT OF WATER	
WEIGHT OF SAMPLE	
MOISTURE CONTENT %	4.3

R-VALUE:	**63**
Location:	



Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

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Checked By: J.B.	TECH: Uly P.
Job Number: 20180876.001A	DATE: 2-Apr-20

R-Value (ASTM D2844)

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-32

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: March 17, 2020
Purchase Order Number: 20180876.001A
Sales Order Number: 47383
Account Number: KLE
To:
--
Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO7724-1 Customers Phone: 619-831-4600
Fax: 619-831-4619
Sample Designation:
--
One soil sample received on 03/11/20 at 10:45am, marked as
Project: Camino Del Mar Bridge Replacement
Project #: 20180876.001A
Boring #: R-20-001
Sample #: S1
Depth 0.5'-5.5'
Sampled by S. Tena
Date Sampled 02/20/2020

Analysis By California Test 643, 1999, Department of Transportation Division of Construction, Method for Estimating the Service Life of Steel Culverts.

pH 9.0

Water Added (ml)	Resistivity (ohm-cm)
10	42000
5	32000
5	24000
5	18000
5	16000
5	14000
5	12000
5	14000
5	17000

85 years to perforation for a 16 gauge metal culvert.
110 years to perforation for a 14 gauge metal culvert.
152 years to perforation for a 12 gauge metal culvert.
195 years to perforation for a 10 gauge metal culvert.
237 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.004% (42 ppm)

Water Soluble Chloride Calif. Test 422 0.002% (21 ppm)

Laura Torres
LT/dbb

KLEINFELDER
Bright People. Right Solutions.

Corrosion Testing

FIGURE

C-33

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

CHECKED BY: J.B. TECH: Clarkson Lab
JOB NUMBER: 20180876.001A DATE: 2-Apr-20

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: March 17, 2020
Purchase Order Number: 20180876.001A
Sales Order Number: 47383
Account Number: KLE
To:
--
Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO7724-2 Customers Phone: 619-831-4600
Fax: 619-831-4619
Sample Designation:
--
One soil sample received on 03/11/20 at 10:45am,
marked as
Project: Camino Del Mar Bridge Replacement
Project #: 20180876.001A
Boring #: R-20-002
Sample #: S1
Depth 0.5'-4'
Sampled by S. Tena
Date Sampled 02/20/2020

Analysis By California Test 643, 1999, Department of Transportation
Division of Construction, Method for Estimating the Service Life of
Steel Culverts.

pH 8.7

Water Added (ml)	Resistivity (ohm-cm)
10	31000
5	23000
5	18000
5	13000
5	19000
5	23000

87 years to perforation for a 16 gauge metal culvert.
114 years to perforation for a 14 gauge metal culvert.
157 years to perforation for a 12 gauge metal culvert.
201 years to perforation for a 10 gauge metal culvert.
245 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.005% (45 ppm)

Water Soluble Chloride Calif. Test 422 0.002% (21 ppm)

Laura Torres

Laura Torres
LT/dbb

KLEINFELDER
Bright People. Right Solutions.

Corrosion Testing

FIGURE

C-34

CHECKED BY: J.B. TECH: Clarkson Lab
JOB NUMBER: 20180876.001A DATE: 2-Apr-20

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: March 25, 2020
Purchase Order Number: 20180876.001A
Sales Order Number: 47494
Account Number: KLE

To:
--
Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO7733-1 Customers Phone: 619-831-4600
Fax: 619-831-4619

Sample Designation:
--
One soil sample received on 03/20/20 at 9:20am,
marked as:
Project: Camino Del Mar Bridge Replacement
Project #: 20180876.001A
Boring #: R-20-001
Sample #: S13
Depth: 51'-51.5'
Sampled by S. Tena
Date Sampled 02/20/20

Analysis By California Test 643, 1999, Department of Transportation Division of Construction, Method for Estimating the Service Life of Steel Culverts.

pH 9.0

Water Added (ml)	Resistivity (ohm-cm)
15	590
5	400
5	290
5	220
5	200
5	190
5	190
5	200
5	210

15 years to perforation for a 16 gauge metal culvert.
20 years to perforation for a 14 gauge metal culvert.
28 years to perforation for a 12 gauge metal culvert.
36 years to perforation for a 10 gauge metal culvert.
43 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.060% (600ppm)

Water Soluble Chloride Calif. Test 422 0.246% (2460ppm)

Rosa Bernal
RMB/ilv

KLEINFELDER
Bright People. Right Solutions.

Corrosion Testing

FIGURE

C-35

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

CHECKED BY: J.B. TECH: Clarkson Lab
JOB NUMBER: 20180876.001A DATE: 13-May-20

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: March 25, 2020
Purchase Order Number: 20180876.001A
Sales Order Number: 47494
Account Number: KLE

To:
--
Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO7733-2 Customers Phone: 619-831-4600
Fax: 619-831-4619
Sample Designation:
--
One soil sample received on 03/20/20 at 9:20am,
marked as:
Project: Camino Del Mar Bridge Replacement
Project #: 20180876.001A
Boring #: R-20-002
Sample #: S30
Depth: 126'-126.5'
Sampled by S. Tena
Date Sampled 02/20/20

Analysis By California Test 643, 1999, Department of Transportation
Division of Construction, Method for Estimating the Service Life of
Steel Culverts.

pH 8.0

Water Added (ml)	Resistivity (ohm-cm)
20	220
5	200
5	150
5	110
5	100
5	93
5	85
5	120
5	140

11 years to perforation for a 16 gauge metal culvert.
14 years to perforation for a 14 gauge metal culvert.
20 years to perforation for a 12 gauge metal culvert.
26 years to perforation for a 10 gauge metal culvert.
31 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.087% (870ppm)

Water Soluble Chloride Calif. Test 422 0.748% (7480ppm)

Rosa Bernal
RMB/ilv

KLEINFELDER
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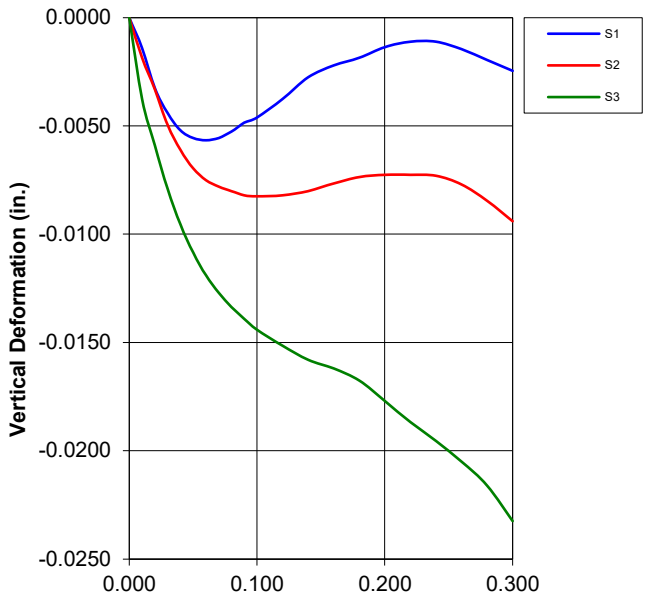
Corrosion Testing

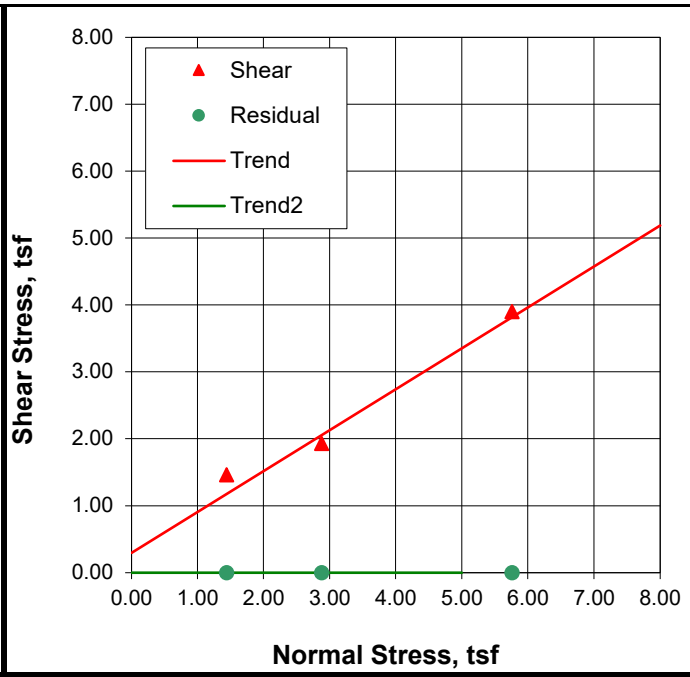
FIGURE

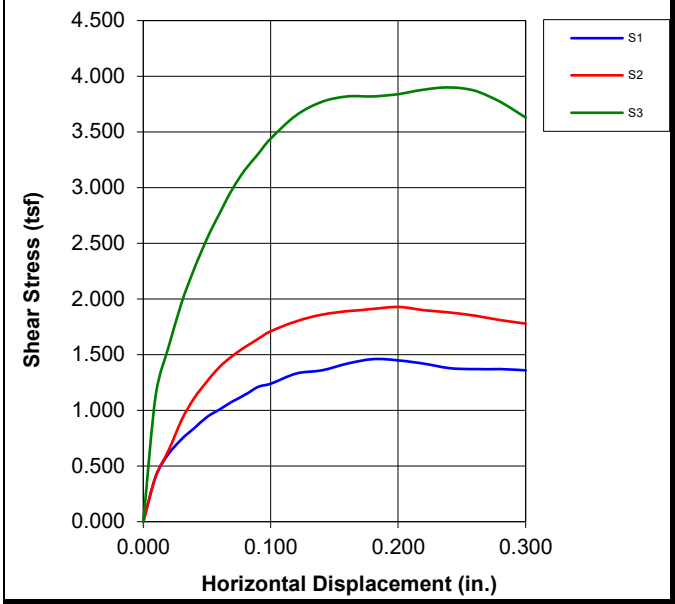
C-36

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

CHECKED BY: J.B. TECH: Clarkson Lab
JOB NUMBER: 20180876.001A DATE: 13-May-20







Specimen Number		1	2	3	
Initial	Water Content, %	35.0	34.1	33.5	
	Dry Density, pcf	86.0	87.0	86.8	
	Void Ratio	0.960	0.936	0.941	
	Saturation, %	98.5	98.4	96.2	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
At Test	Water Content, %	41.6	41.2	41.1	
	Dry Density, pcf	91.2	92.3	97.3	
	Void Ratio	0.851	0.840	0.771	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.91	0.91	0.88	
Maximum Shear Stress, tsf		1.46	1.93	3.90	
Residual Shear Stress, tsf		na	na	na	
Hoizontal Displacment, in.		0.180	0.200	0.240	
Normal Stress, tsf		1.44	2.88	5.76	
Strain Rate, in./min.		0.001	0.001	0.001	

LL:	nm	PL:	nm	PI:	nm	G_S:	2.70	Assumed

	c, tsf	ϕ, deg.	Tan ϕ
Failure	0.3	31.4	0.61
Residual	na	na	na

Test Conditions: Undisturbed / Inundated

Specimen 1: Greenish Black Silt

Specimen 2: Greenish Black Silt

Specimen 3: Greenish Black Silt

Boring:	R-20-001
Sample:	S23
Depth, ft:	101.0-101.5
Test Date:	3/18/2020

Remarks: nm = not measured, na = not applicable

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. The user of this report retains the sole responsibility to evaluate and approve any interpreted values from the testing.

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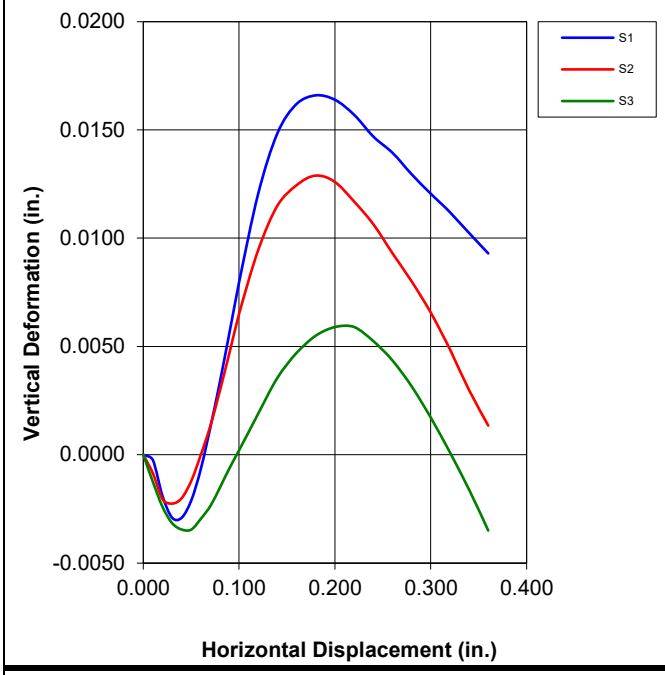
PROJECT NO.:	20180876
ENTRY BY:	A. Wohletz
CHECKED BY:	S. Rader
DATE:	3/23/2020

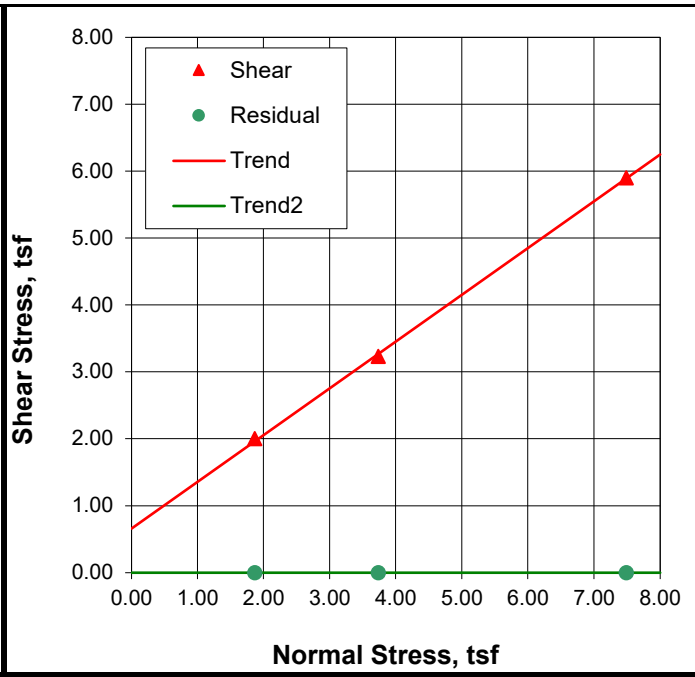
DIRECT SHEAR TEST ASTM D3080

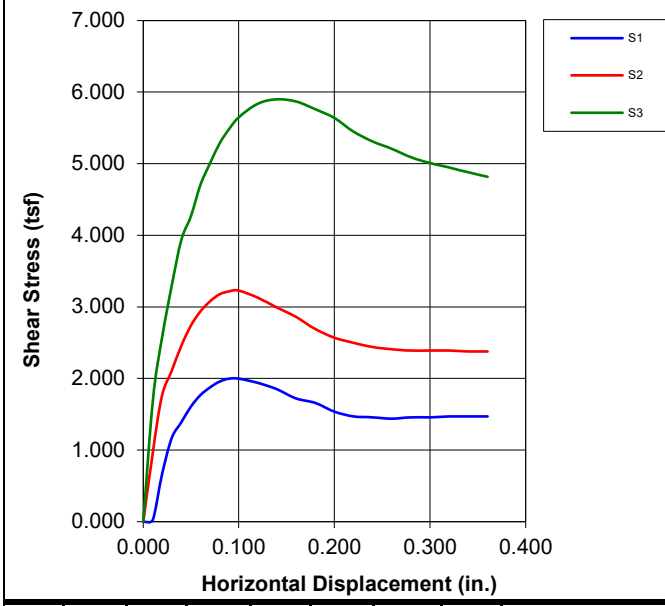
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-37







	Specimen Number	1	2	3	
Initial	Water Content, %	20.6	21.5	21.0	
	Dry Density, pcf	103.5	102.7	103.4	
	Void Ratio	0.628	0.640	0.629	
	Saturation, %	88.7	90.9	90.0	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
At Test	Water Content, %	22.7	23.9	23.1	
	Dry Density, pcf	105.4	105.3	107.4	
	Void Ratio	0.588	0.588	0.563	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.94	0.93	0.92	
	Maximum Shear Stress, tsf	2.00	3.23	5.90	
	Residual Shear Stress, tsf	na	na	na	
	Hoizontal Displacment, in.	0.090	0.100	0.140	
	Normal Stress, tsf	1.87	3.74	7.49	
	Strain Rate, in./min.	0.005	0.005	0.005	

LL:	nm	PL:	nm	PI:	nm	G_S:	2.70	Assumed

	c, tsf	ϕ, deg.	Tan ϕ
Failure	0.7	34.9	0.70
Residual	na	na	na

Test Conditions: Undisturbed / Inundated

Specimen 1: Bluish Gray Poorly Graded Sand

Specimen 2: Bluish Gray Poorly Graded Sand

Specimen 3: Bluish Gray Poorly Graded Sand

Boring:	R-20-001
Sample:	S29
Depth, ft:	131.0-131.5
Test Date:	3/20/2020

Remarks: nm = not measured, na = not applicable

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. The user of this report retains the sole responsibility to evaluate and approve any interpreted values from the testing.

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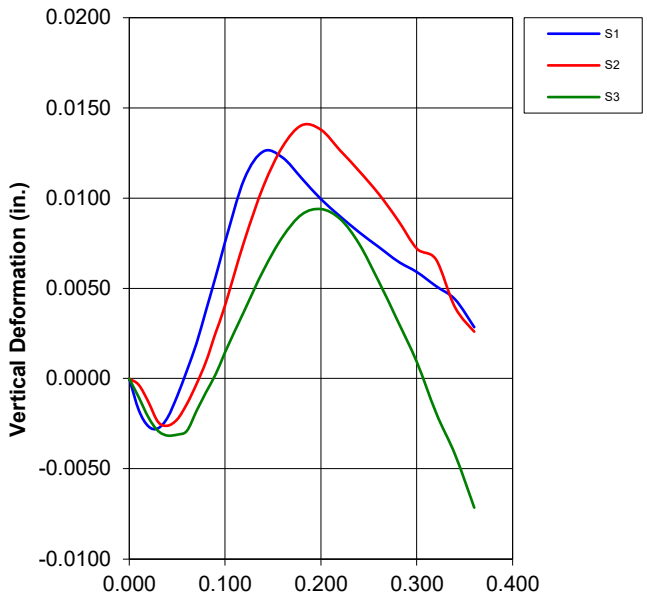
PROJECT NO.:	20180876
ENTRY BY:	A. Wohletz
CHECKED BY:	S. Rader
DATE:	3/23/2020

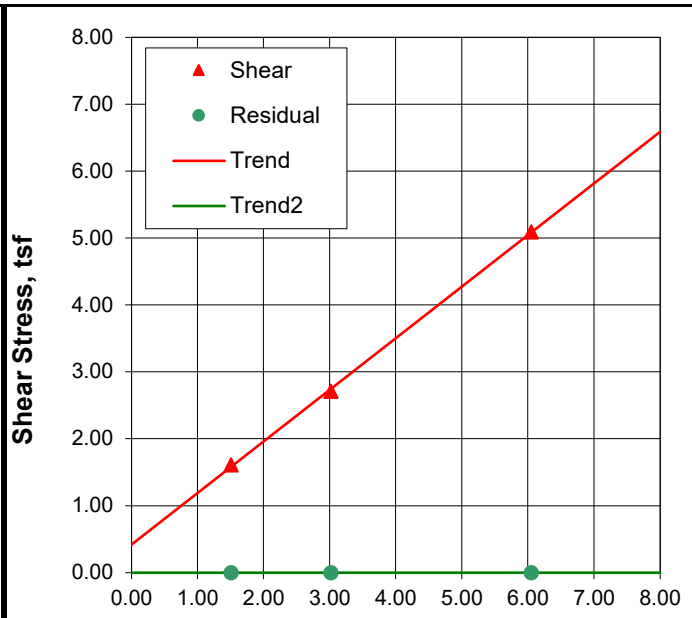
DIRECT SHEAR TEST ASTM D3080

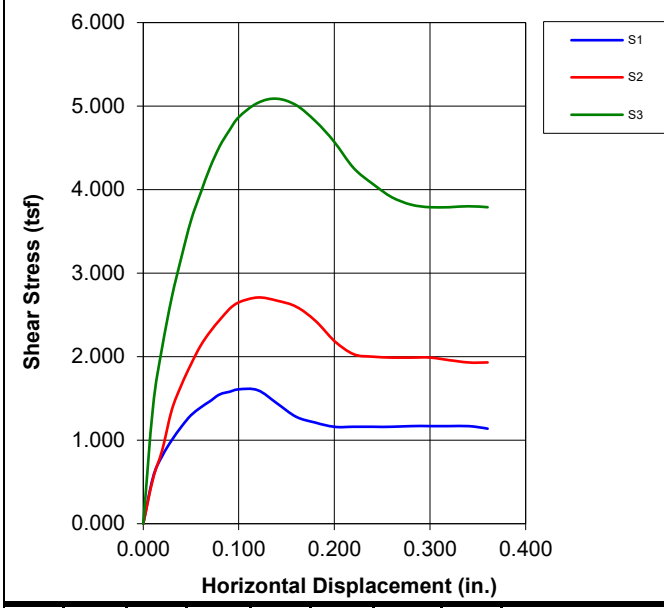
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-38







Specimen Number		1	2	3	
Initial	Water Content, %	25.6	26.2	25.3	
	Dry Density, pcf	99.6	100.3	101.1	
	Void Ratio	0.660	0.649	0.636	
	Saturation, %	102.8	107.1	105.4	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
At Test	Water Content, %	27.9	25.8	27.3	
	Dry Density, pcf	101.4	103.2	106.4	
	Void Ratio	0.617	0.589	0.544	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.94	0.93	0.91	
Maximum Shear Stress, tsf		1.61	2.71	5.09	
Residual Shear Stress, tsf		na	na	na	
Hoizontal Displacment, in.		0.100	0.120	0.140	
Normal Stress, tsf		1.51	3.02	6.05	
Strain Rate, in./min.		0.005	0.005	0.005	

LL:	NM	PL:	NM	PI:	NM	G_S:	2.65	Assumed

	c, tsf	ϕ, deg.	Tan ϕ
Failure	0.4	37.6	0.77
Residual	na	na	na

Test Conditions: Undisturbed / Inundated

Specimen 1: Gray Poorly Graded Sand

Specimen 2: Gray Poorly Graded Sand

Specimen 3: Gray Poorly Graded Sand

Boring:	R-20-002
Sample:	S26
Depth, ft:	106.0-106.5
Test Date:	3/24/2020

Remarks: nm = not measured, na = not applicable

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. The user of this report retains the sole responsibility to evaluate and approve any interpreted values from the testing.

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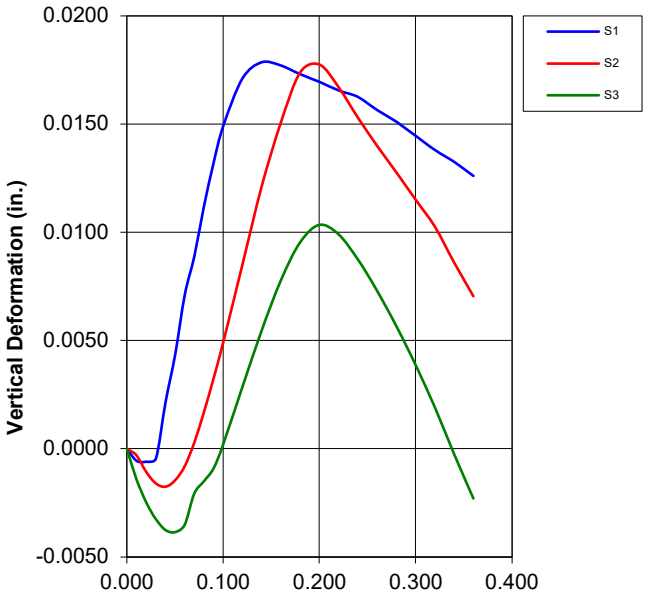
PROJECT NO.:	20180876
ENTRY BY:	A. Wohletz
CHECKED BY:	S. Rader
DATE:	3/25/2020

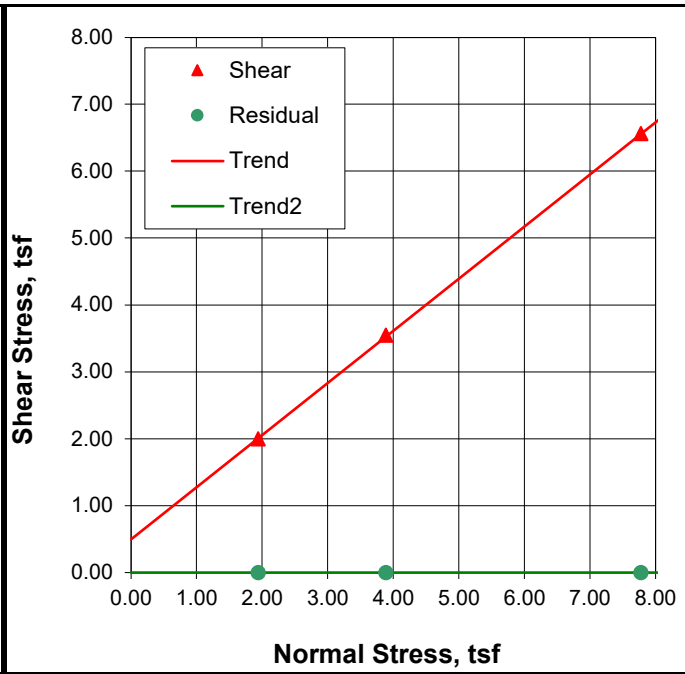
DIRECT SHEAR TEST ASTM D3080

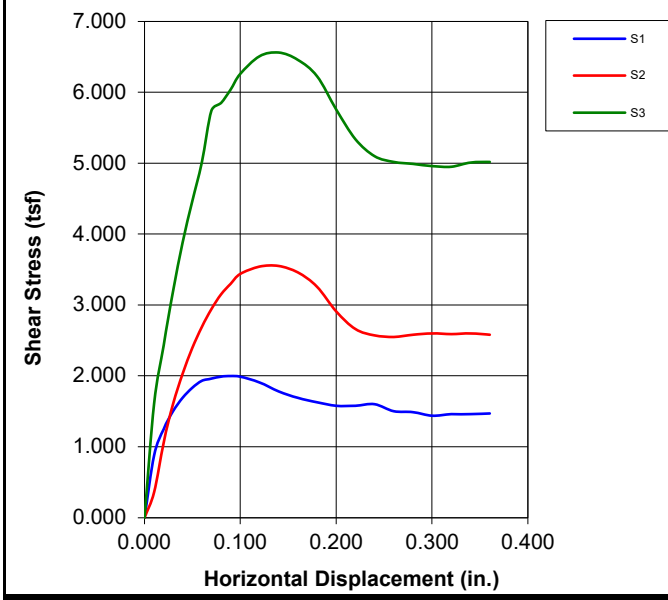
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-39







	Specimen Number	1	2	3	
Initial	Water Content, %	17.5	17.8	17.3	
	Dry Density, pcf	111.2	112.4	113.7	
	Void Ratio	0.487	0.471	0.454	
	Saturation, %	95.2	99.9	100.7	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
At Test	Water Content, %	20.5	20.9	19.2	
	Dry Density, pcf	109.7	111.0	113.1	
	Void Ratio	0.487	0.471	0.454	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
	Maximum Shear Stress, tsf	2.00	3.55	6.56	
	Residual Shear Stress, tsf	na	na	na	
	Hoizontal Displacment, in.	0.090	0.140	0.140	
	Normal Stress, tsf	1.94	3.89	7.78	
	Strain Rate, in./min.	0.005	0.005	0.005	

LL:	nm	PL:	nm	PI:	nm	G_S:	2.65	Assumed

	c, tsf	ϕ, deg.	Tan ϕ
Failure	0.5	37.9	0.78
Residual	na	na	na

Test Conditions: Undisturbed / Inundated

Specimen 1: Gray Poorly Graded Sand

Specimen 2: Gray Poorly Graded Sand

Specimen 3: Gray Poorly Graded Sand

Boring:	R-20-002
Sample:	S32
Depth, ft:	136-136.5
Test Date:	4/3/2020

Remarks: nm = not measured, na = not applicable

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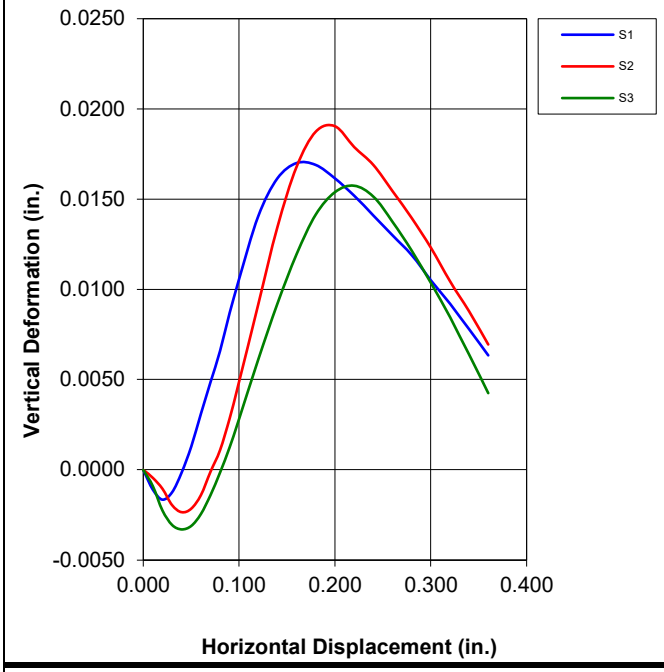
PROJECT NO.:	20180876
ENTRY BY:	A. Wohletz
CHECKED BY:	S. Rader
DATE:	4/6/2020

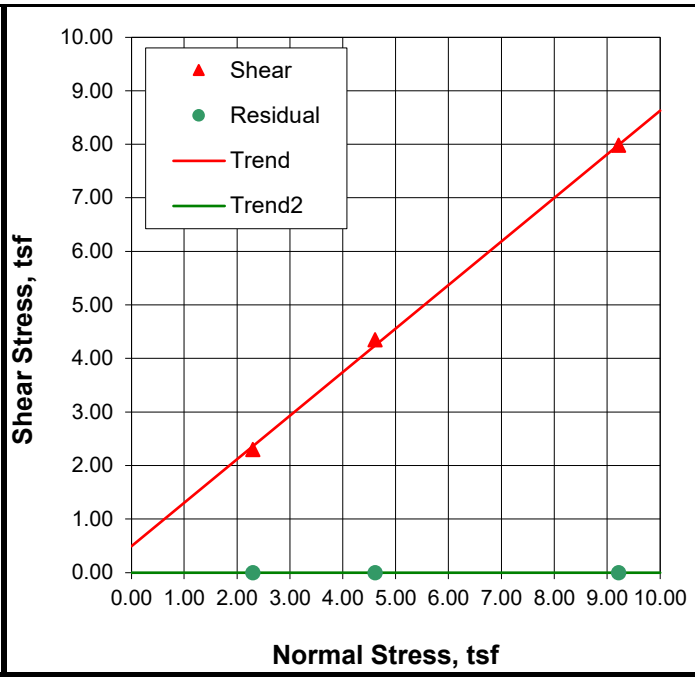
DIRECT SHEAR TEST ASTM D3080

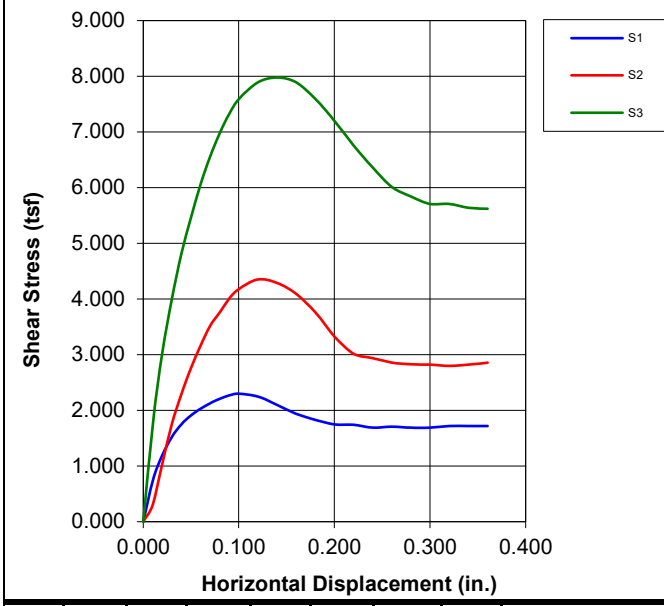
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-40







Specimen Number		1	2	3	
Initial	Water Content, %	15.9	16.2	17.3	
	Dry Density, pcf	109.1	112.3	111.6	
	Void Ratio	0.516	0.473	0.482	
	Saturation, %	81.6	90.7	95.3	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
At Test	Water Content, %	20.4	20.4	19.9	
	Dry Density, pcf	110.8	116.9	116.0	
	Void Ratio	0.476	0.401	0.411	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.93	0.91	0.91	
Maximum Shear Stress, tsf		2.30	4.35	7.98	
Residual Shear Stress, tsf		na	na	na	
Hoizontal Displacment, in.		0.100	0.120	0.140	
Normal Stress, tsf		2.30	4.61	9.22	
Strain Rate, in./min.		0.005	0.005	0.005	

LL:	NM	PL:	NM	PI:	NM	G_S:	2.65	Assumed

	c, tsf	ϕ, deg.	Tan ϕ
Failure	0.5	39.1	0.81
Residual	na	na	na

Test Conditions: Undisturbed / Inundated

Specimen 1: Gray Poorly Graded Sand

Specimen 2: Gray Poorly Graded Sand

Specimen 3: Gray Poorly Graded Sand

Boring:	R-20-002
Sample:	S36
Depth, ft:	161
Test Date:	03/26/2020

Remarks: nm = not measured, na = not applicable

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PROJECT NO.:	20180876
ENTRY BY:	A. Wohletz
CHECKED BY:	S. Rader
DATE:	03/27/2020

DIRECT SHEAR TEST ASTM D3080

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

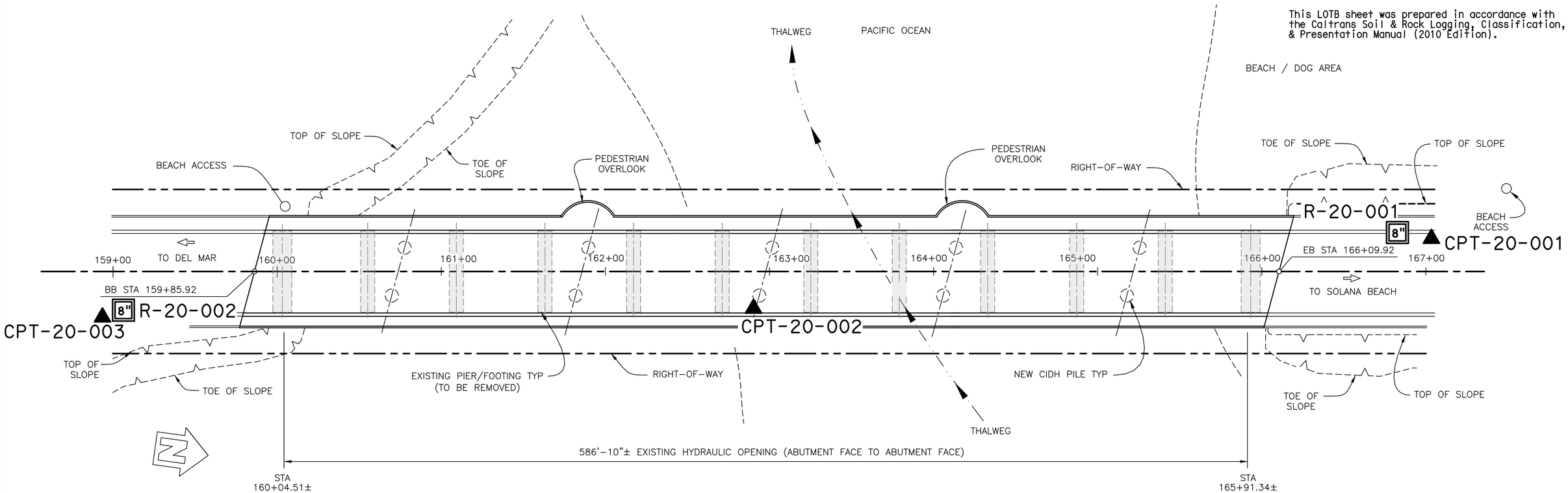
FIGURE

C-41

APPENDIX D
LOG OF TEST BORINGS (LOTBs)

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This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).



PLAN

SCALE: 1"=30'

HOLE ID	STATION AND OFFSET
CPT-20-003	158+93 / 27.79 Rt
R-20-002	159+06 / 23.60 Rt
CPT-20-002	162+90 / 22.51 Rt
R-20-001	166+83 / 23.70 Lt
CPT-20-001	167+03 / 20.16 Lt

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: D. Fahrney | DRAWN: D. Fahrney | CHECKED: J. Bonfiglio

ENGINEER OF WORK | R.C.E. NO. | DATE

KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA. 92101 (619) 831-4600

APPROVED

PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR

CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

SHEET 1 OF 8 SHEETS

ORIGINAL SCALE: 0 1" 1 2" 1 3" 1 4 INCHES

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE
"LOG OF TEST BORINGS" SHEET 1 OF 8

Station 166+83
Offset 23.7 Lt

R-20-001

8"

Elev. 16.00

			M PA R CR	ASPHALT CONCRETE; (5") POORLY GRADED SAND with SILT (SP-SM); yellowish red (5YR 5/6); moist; mostly medium to fine SAND; little fines; non-plastic (ARTIFICIAL FILL (af)).
26	1.4			- yellow (10YR 7/6) and dark yellowish brown (10YR 4/4); coarse to fine SAND
				- medium dense; strong brown (7.5YR 4/6); medium to fine SAND
21	1.4		M PA	POORLY GRADED SAND with SILT (SP-SM); medium dense; light brownish gray (2.5Y 6/1); moist; mostly fine SAND; little fines; non-plastic (RECENT ALLUVIAL DEPOSITS (Qa)).
19	1.4			
16	1.4		M PA PI	- gray (2.5Y 5/1); medium to fine SAND; increase in moisture content
25	1.4		M	- wet
17	1.4		M PA	POORLY GRADED SAND (SP); medium dense; gray (2.5Y 5/1); wet; medium to fine SAND; non-plastic; micaceous
12	1.4		M	POORLY GRADED SAND with SILT (SP-SM); medium dense; dark gray (2.5Y 4/1); wet; medium to fine SAND; little fines; non-plastic
6	1.4	4"	PA	- loose; few coarse subrounded GRAVEL, 2 in. max. dia.
13	1.4			SILTY SAND (SM); medium dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines
				LEAN CLAY (CL); very soft; dark gray (2.5Y 4/1); wet; few fine SAND; mostly fines; medium plasticity
7	2.4		M UW PI	-PP=0.0 tsf
				SILTY SAND (SM); loose; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; trace shell fragments
8	1.4		PA PI	FAT CLAY (CH); very soft; dark gray (2.5Y 4/1); wet; few medium SAND; mostly fines; medium to high plasticity; trace roots and shell fragments; PP=0.0 tsf
52	2.4			SILTY SAND with GRAVEL (SM); wet; (inferred from drilling action)
				- subrounded gravel (3") inside sampler
31	1.4			
40	2.4		M UW PA	SILTY SAND (SM); dense; dark gray (2.5Y 4/1); wet; mostly coarse to fine SAND; little fines; non-plastic; trace shell fragments (YOUNG ALLUVIAL DEPOSITS (Qya)).
41	1.4			SILTY SAND (SM); dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic
66	2.4		M UW PA PI	- very dense; micaceous
8	1.4			- loose; PP=0.0 tsf
				SANDY LEAN CLAY (CL); very soft; dark gray (2.5Y 4/1); wet; some fine SAND; mostly fines; low to medium plasticity
51	2.4		M UW PA	POORLY GRADED SAND with SILT (SP-SM); very dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; trace shell fragments
43	1.4		PI	- dense

GWS Elev 2
2-18-20

GWS Elev -1
2-21-20

MATCHLINE
(See "Log of Test Borings 3 of 8")

PROFILE
HOR. 1"=30'
VERT. 1"=5'

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

REVISION | DESCRIPTION | APPROVED | DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: D. Fahrney
DRAWN: D. Fahrney
CHECKED: J. Bonfiglio
ENGINEER OF WORK
R.C.E. NO. DATE

KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA 92101 (619) 831-4600

APPROVED
PUBLIC WORKS DIRECTOR
DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

SHEET 2 OF 8 SHEETS

ORIGINAL SCALE: 0 1 INCHES 2 3 4

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE
"LOG OF TEST BORINGS" SHEET 1 OF 8

-40 -40

-50 -50

MATCHLINE
(See "Log of Test Borings 2 of 8")

-60 -60

71 | 2.4 (M)(UW)(PA) —- very dense

-70 -70

21 | 1.4 SILTY SAND (SM); medium dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic (YOUNG ESTUARINE DEPOSITS (Qyes)).

LEAN CLAY (CL); medium stiff; black (10YR 2/1); wet; few fine SAND; mostly fines; medium plasticity; micaceous, trace shell fragments; PP=0.5 tsf

12 | 2.4 (M)(UW)(PI)(WA)

-80 -80

20 | 1.4 SILTY SAND (SM); medium dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; some fines; non-plastic (OLD ALLUVIAL DEPOSITS (Qoa)).

35 | 2.4 (DS) —- dense

-90 -90

26 | 1.4 POORLY GRADED SAND with SILT (SP-SM); medium dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; micaceous

24 | 2.4 (M)(UW)(PA) —- SAA

-100 -100

33 | 1.4 SILTY SAND (SM); dense; dark gray (10YR 4/1); mostly medium to fine SAND; little fines; non-plastic

57 | 2.4 (M)(UW)(PA) —- very dense

-110 -110

55 | 1.4 —- SAA

53 | 2.4 (DS) —- SAA

-120 -120

36 | 1.4 —- dense

-130 -130

SILTY SAND (SM); dense; dark gray (10YR 4/1); mostly medium to fine SAND; little fines; non-plastic

CLAYSTONE; dark reddish brown (2.5YR 3/4) with grayish green (GLEY 1-5/5GY); medium plasticity (DEL MAR FORMATION (Td)).
-PP >=4.5 tsf

50/5 | 1.4 (PA)(PI)

02-21-20
Terminated at Elev -135.00
Hammer Energy Ratio (ERi) = 94%

-140 -140

-150 -150

-160 -160

-170 -170

-180 -180

-190 -190

PROFILE
HOR. 1"=30'
VERT. 1"=5'

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

REVISION | DESCRIPTION | APPROVED | DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: D. Fahrney
DRAWN: D. Fahrney
CHECKED: J. Bonfiglio
ENGINEER OF WORK
R.C.E. NO. DATE

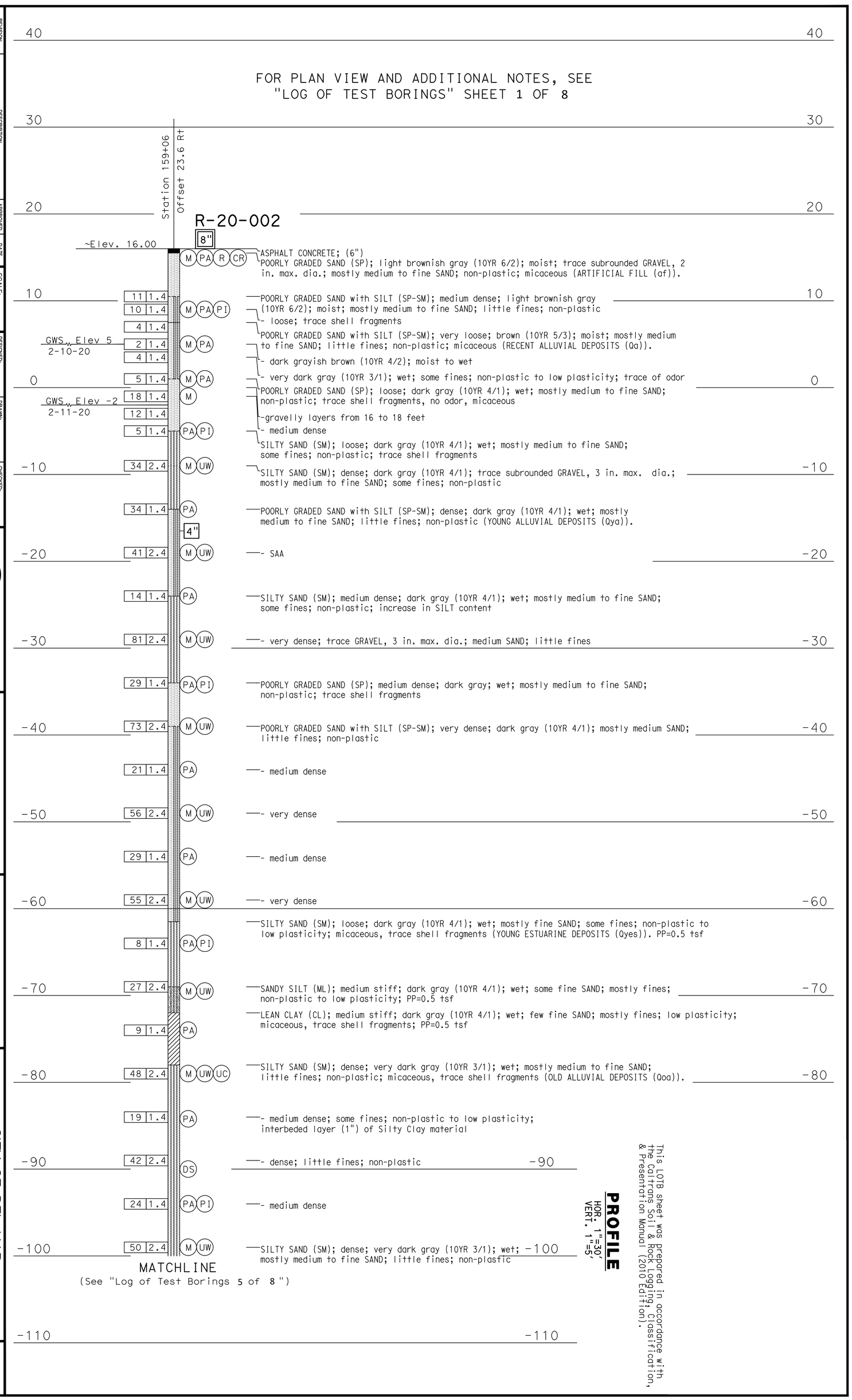
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550 WEST C STREET, SUITE 1200 SAN DIEGO, CA. 92101 (619) 831-4600

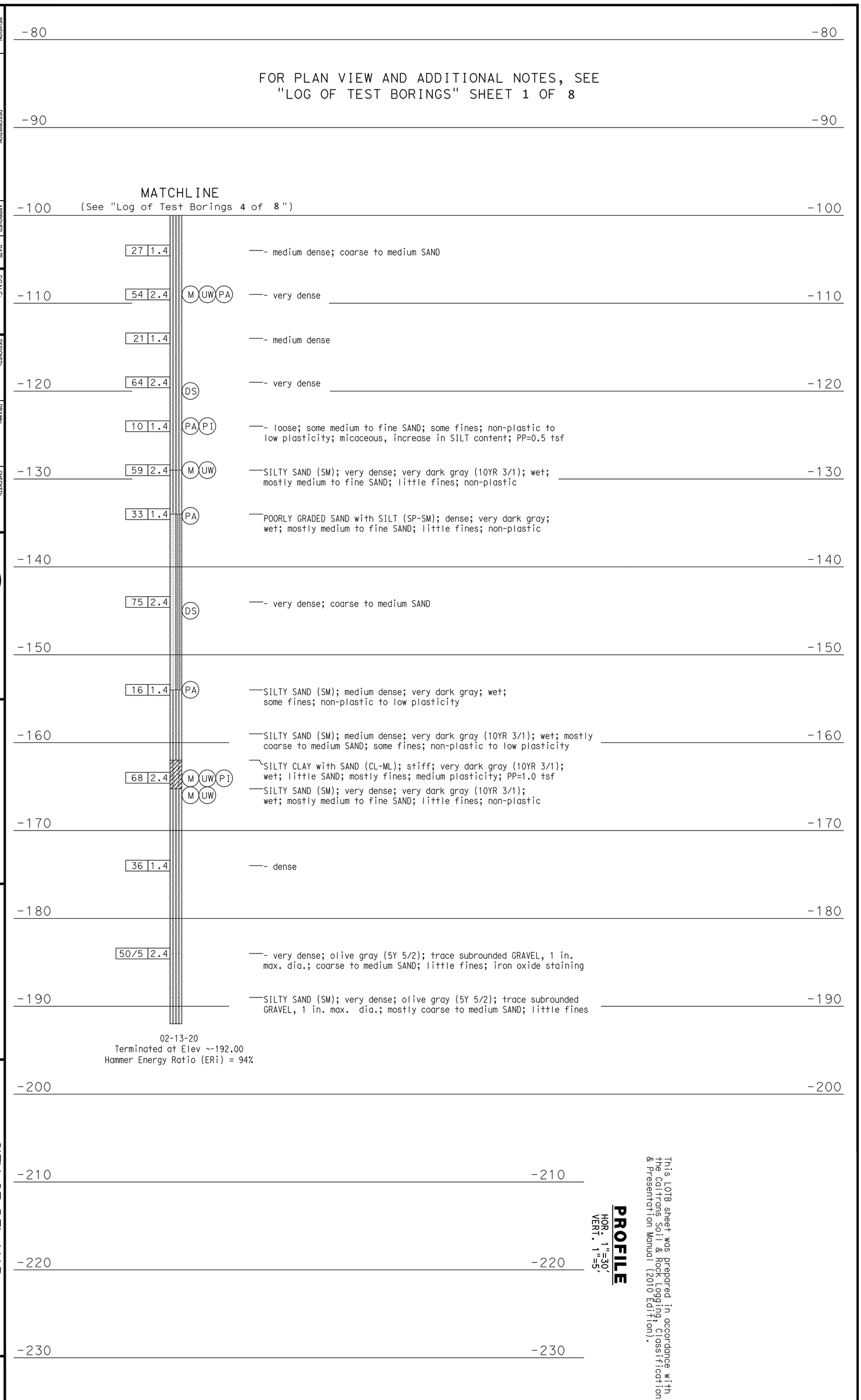
APPROVED
PUBLIC WORKS DIRECTOR
DATE

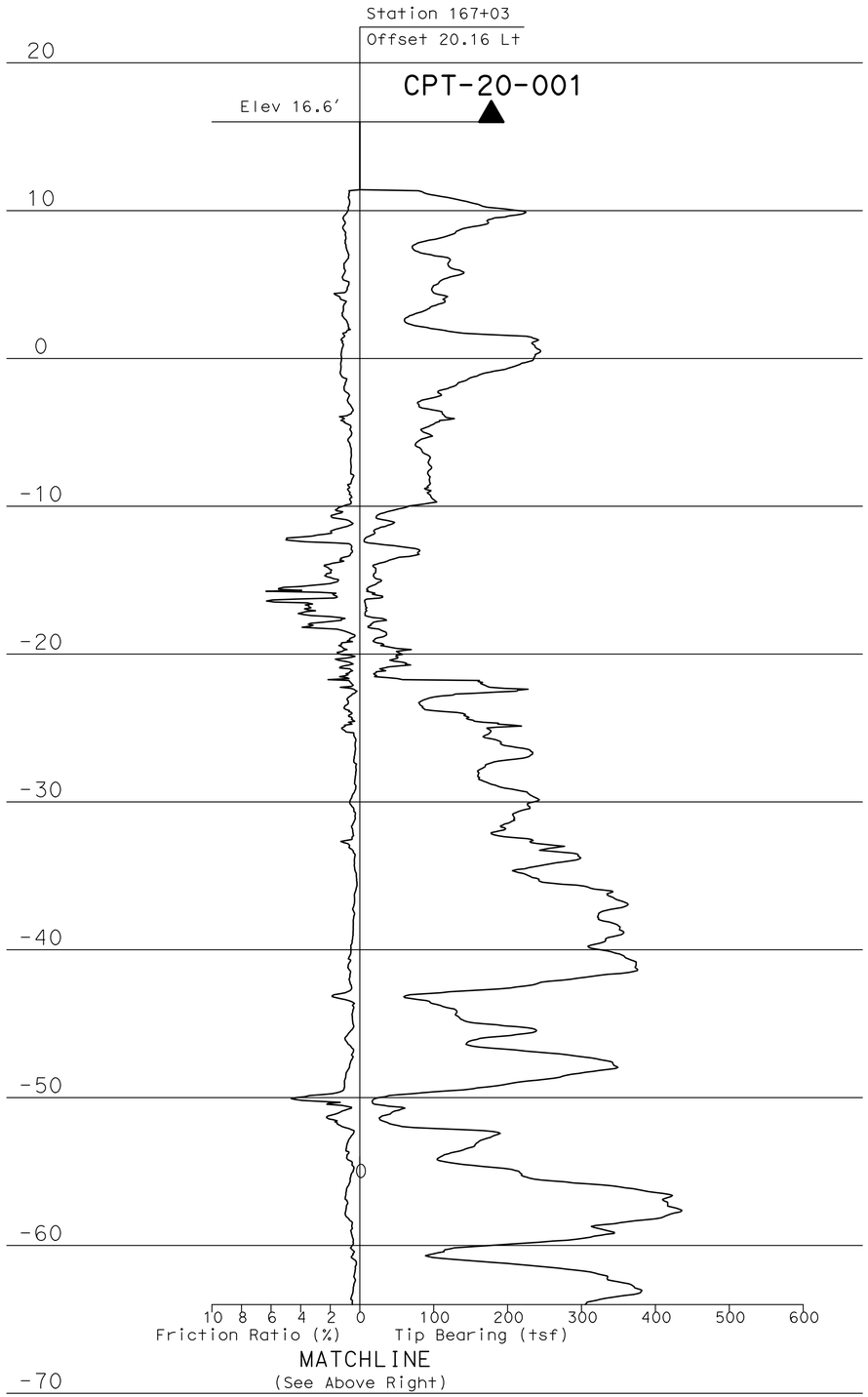
CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

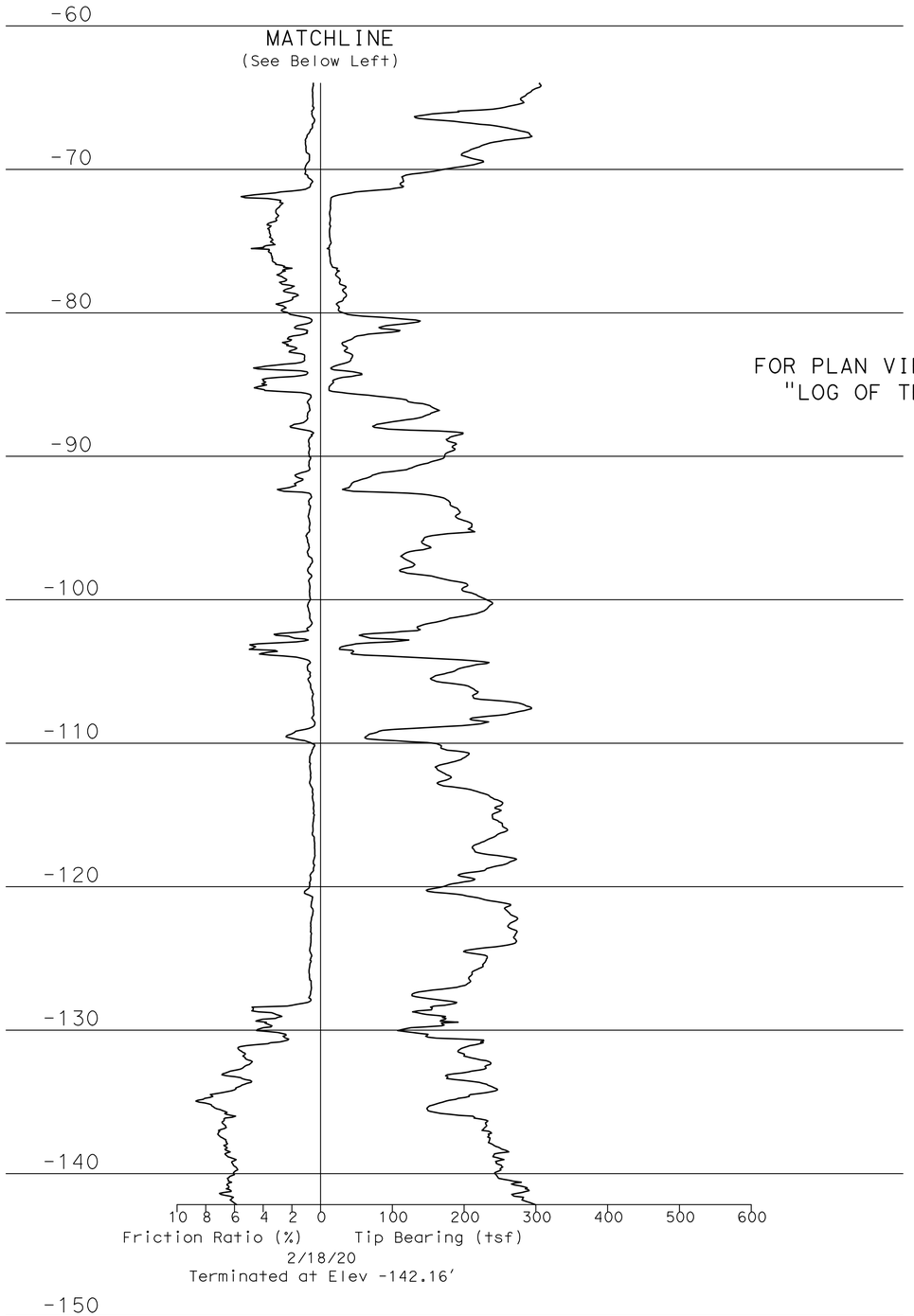
SHEET 3 OF 8 SHEETS

ORIGINAL SCALE: 0 1 INCHES 2 3 4


FOR PLAN VIEW AND ADDITIONAL NOTES, SEE "LOG OF TEST BORINGS" SHEET 1 OF 8
Station 159+06
Offset 23.6 Rt
R-20-002
8"
~Elev. 16.00
ASPHALT CONCRETE; (6")
POORLY GRADED SAND (SP); light brownish gray (10YR 6/2); moist; trace subrounded GRAVEL, 2 in. max. dia.; mostly medium to fine SAND; non-plastic; micaceous (ARTIFICIAL FILL (af)).
POORLY GRADED SAND with SILT (SP-SM); medium dense; light brownish gray (10YR 6/2); moist; mostly medium to fine SAND; little fines; non-plastic
- loose; trace shell fragments
POORLY GRADED SAND with SILT (SP-SM); very loose; brown (10YR 5/3); moist; mostly medium to fine SAND; little fines; non-plastic; micaceous (RECENT ALLUVIAL DEPOSITS (Qa)).
GWS Elev 5 2-10-20
- dark grayish brown (10YR 4/2); moist to wet
- very dark gray (10YR 3/1); wet; some fines; non-plastic to low plasticity; trace of odor
POORLY GRADED SAND (SP); loose; dark gray (10YR 4/1); wet; mostly medium to fine SAND; non-plastic; trace shell fragments, no odor, micaceous
GWS Elev -2 2-11-20
-gravelly layers from 16 to 18 feet
- medium dense
SILTY SAND (SM); loose; dark gray (10YR 4/1); wet; mostly medium to fine SAND; some fines; non-plastic; trace shell fragments
SILTY SAND (SM); dense; dark gray (10YR 4/1); trace subrounded GRAVEL, 3 in. max. dia.; mostly medium to fine SAND; some fines; non-plastic
POORLY GRADED SAND with SILT (SP-SM); dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; little fines; non-plastic (YOUNG ALLUVIAL DEPOSITS (Qya)).
4"
- SAA
SILTY SAND (SM); medium dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; some fines; non-plastic; increase in SILT content
- very dense; trace GRAVEL, 3 in. max. dia.; medium SAND; little fines
POORLY GRADED SAND (SP); medium dense; dark gray; wet; mostly medium to fine SAND; non-plastic; trace shell fragments
POORLY GRADED SAND with SILT (SP-SM); very dense; dark gray (10YR 4/1); mostly medium SAND; little fines; non-plastic
- medium dense
- very dense
- medium dense
- very dense
SILTY SAND (SM); loose; dark gray (10YR 4/1); wet; mostly fine SAND; some fines; non-plastic to low plasticity; micaceous, trace shell fragments (YOUNG ESTUARINE DEPOSITS (Qyes)). PP=0.5 tsf
SANDY SILT (ML); medium stiff; dark gray (10YR 4/1); wet; some fine SAND; mostly fines; non-plastic to low plasticity; PP=0.5 tsf
LEAN CLAY (CL); medium stiff; dark gray (10YR 4/1); wet; few fine SAND; mostly fines; low plasticity; micaceous, trace shell fragments; PP=0.5 tsf
SILTY SAND (SM); dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic; micaceous, trace shell fragments (OLD ALLUVIAL DEPOSITS (Qoa)).
- medium dense; some fines; non-plastic to low plasticity; interbeded layer (1") of Silty Clay material
- dense; little fines; non-plastic
- medium dense
SILTY SAND (SM); dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic
MATCHLINE
(See "Log of Test Borings 5 of 8")
PROFILE
HOR. 1"=30'
VERT. 1"=5'
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).
REVISION
DESCRIPTION
APPROVED
DATE
SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.
DESIGNED: D. Fahrney
DRAWN: D. Fahrney
CHECKED: J. Bontiglio
ENGINEER OF WORK
R.C.E. NO.
DATE
KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA 92101 (619) 831-4600
APPROVED
PUBLIC WORKS DIRECTOR
DATE
CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 - 6-SPAN OPTION
LOG OF TEST BORINGS
SHEET 4 OF 8 SHEETS
ORIGINAL SCALE:
INCHES


-80
-80
FOR PLAN VIEW AND ADDITIONAL NOTES, SEE
"LOG OF TEST BORINGS" SHEET 1 OF 8
-90
-90
MATCHLINE
(See "Log of Test Borings 4 of 8")
-100
-100
27 1.4
- medium dense; coarse to medium SAND
-110
54 2.4
M UW PA
- very dense
-110
21 1.4
- medium dense
-120
64 2.4
DS
- very dense
-120
10 1.4
PA PI
- loose; some medium to fine SAND; some fines; non-plastic to low plasticity; micaceous, increase in SILT content; PP=0.5 tsf
-130
59 2.4
M UW
SILTY SAND (SM); very dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic
-130
33 1.4
PA
POORLY GRADED SAND with SILT (SP-SM); dense; very dark gray; wet; mostly medium to fine SAND; little fines; non-plastic
-140
-140
75 2.4
DS
- very dense; coarse to medium SAND
-150
-150
16 1.4
PA
SILTY SAND (SM); medium dense; very dark gray; wet; some fines; non-plastic to low plasticity
-160
SILTY SAND (SM); medium dense; very dark gray (10YR 3/1); wet; mostly coarse to medium SAND; some fines; non-plastic to low plasticity
-160
SILTY CLAY with SAND (CL-ML); stiff; very dark gray (10YR 3/1); wet; little SAND; mostly fines; medium plasticity; PP=1.0 tsf
68 2.4
M UW PI
M UW
SILTY SAND (SM); very dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic
-170
-170
36 1.4
- dense
-180
-180
50/5 2.4
- very dense; olive gray (5Y 5/2); trace subrounded GRAVEL, 1 in. max. dia.; coarse to medium SAND; little fines; iron oxide staining
-190
SILTY SAND (SM); very dense; olive gray (5Y 5/2); trace subrounded GRAVEL, 1 in. max. dia.; mostly coarse to medium SAND; little fines
-190
02-13-20
Terminated at Elev ~-192.00
Hammer Energy Ratio (ERi) = 94%
-200
-200
-210
-210
-220
-220
-230
-230
PROFILE
HOR. 1"=30'
VERT. 1"=5'
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).
REVISION
DESCRIPTION
APPROVED
DATE
SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.
DESIGNED: D. Fahrney
DRAWN: D. Fahrney
CHECKED: J. Bonfiglio
ENGINEER OF WORK
R.C.E. NO.
DATE
KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA. 92101 (619) 831-4600
APPROVED
PUBLIC WORKS DIRECTOR
DATE
CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 - 6-SPAN OPTION
LOG OF TEST BORINGS
SHEET 5 OF 8 SHEETS
ORIGINAL SCALE:
0 1 INCHES 2 3 4





This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE "LOG OF TEST BORINGS" SHEET 1 OF 8

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: D. Fahrney | DRAWN: D. Fahrney | CHECKED: J. Bonfiglio

ENGINEER OF WORK | R.C.E. NO. | DATE

KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA. 92101 (619) 831-4600

APPROVED

PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR

CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

SHEET 6 OF 8 SHEETS

ORIGINAL SCALE: 6 1 1 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1 3 1 1 1 1 1 1 1 1 4 INCHES

20

10

Station 162+90
Offset 22.51 Rt

CPT-20-002A

0 Elev 0′

-10

-20

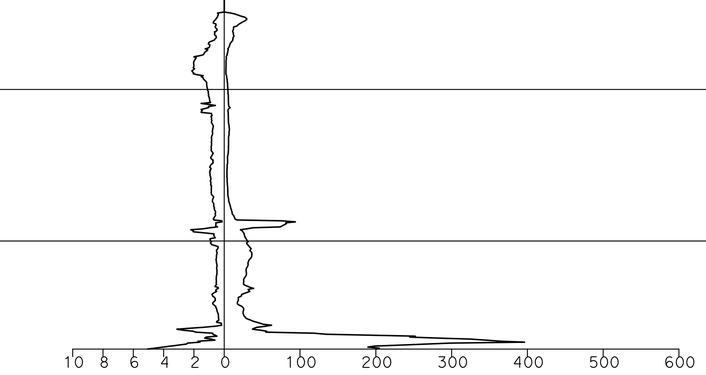
-30

-40

-50

-60

-70



2/21/20
Terminated at Elev -37.13′

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE "LOG OF TEST BORINGS" SHEET 1 OF 8

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: D. Fahrney | DRAWN: D. Fahrney | CHECKED: J. Bonfiglio

ENGINEER OF WORK R.C.E. NO. DATE

KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA. 92101 (619) 831-4600

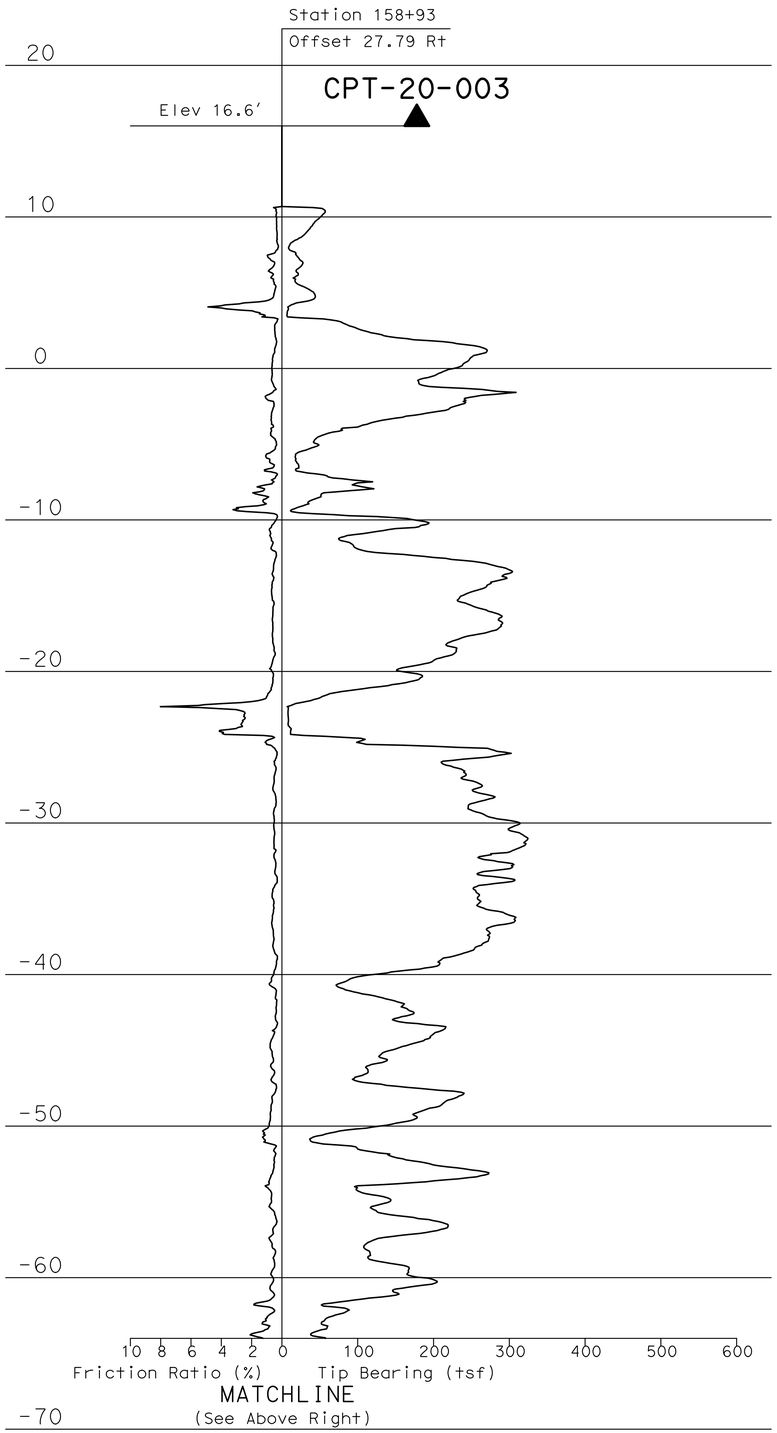
APPROVED

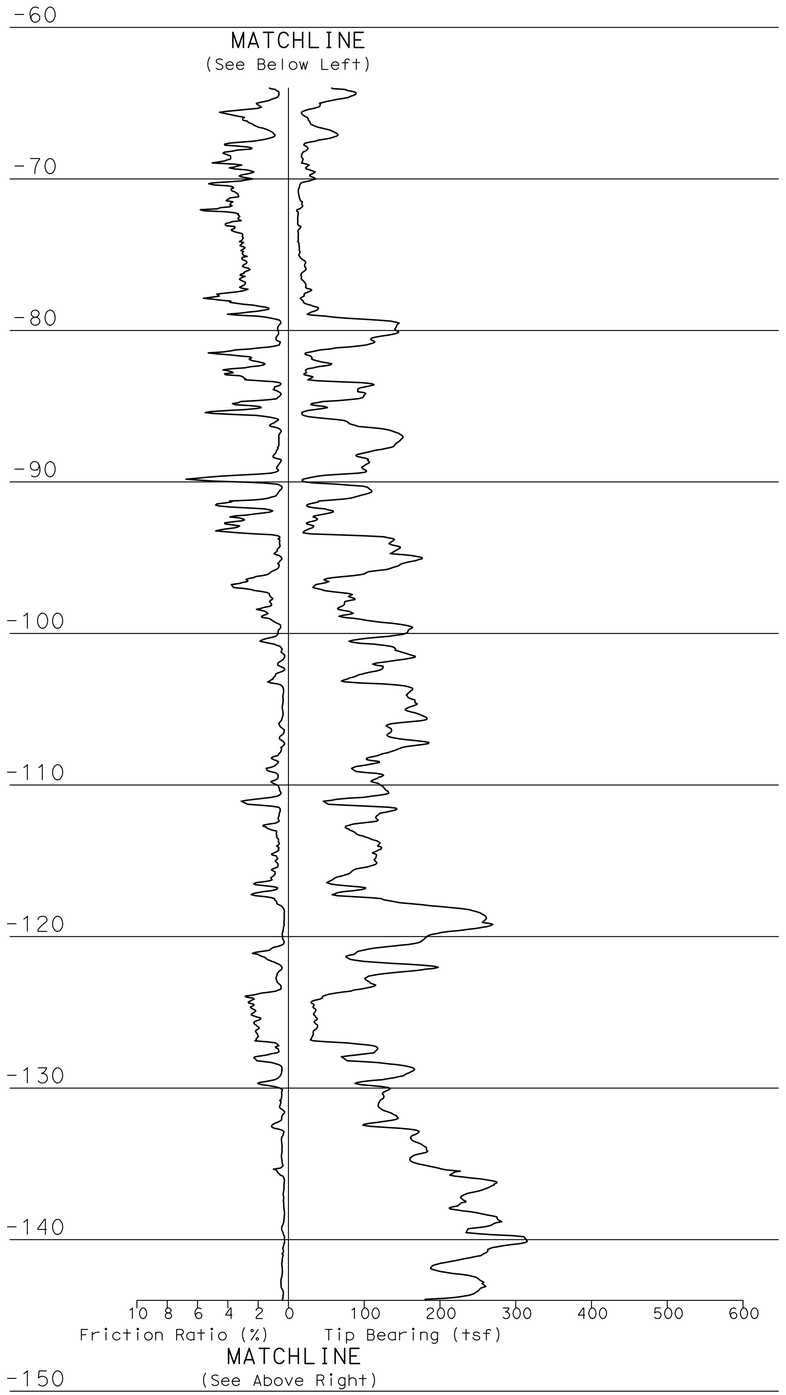
PUBLIC WORKS DIRECTOR DATE

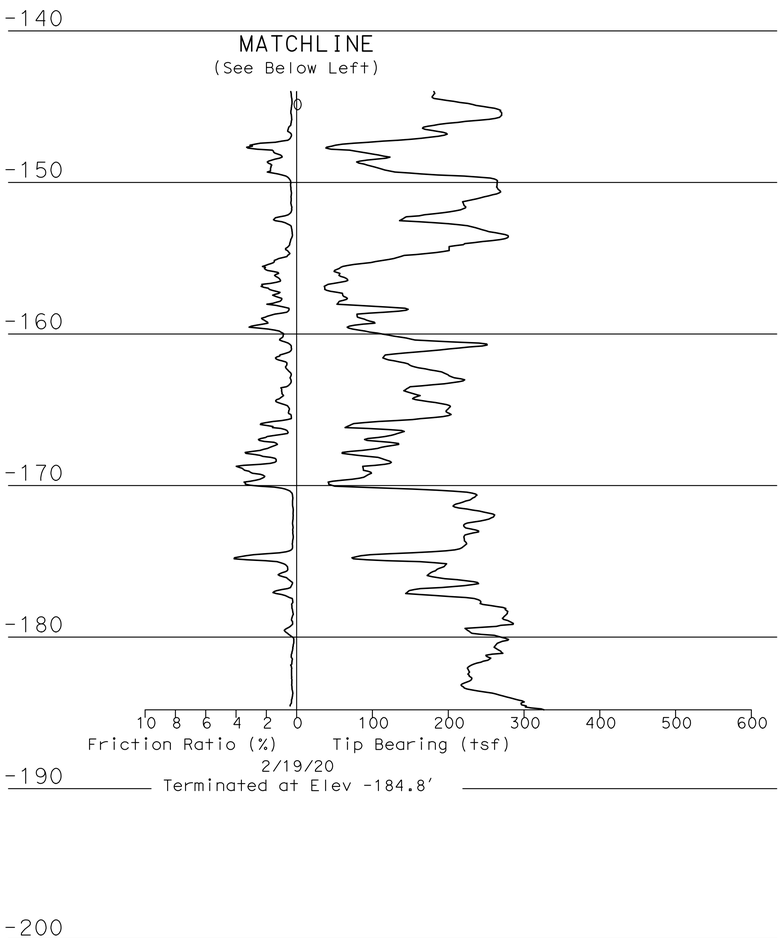
CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

SHEET 7 OF 8 SHEETS

ORIGINAL SCALE: 0 1 1 1 1 1 1 INCHES 2 1 1 1 1 1 3 1 1 1 1 4







This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE "LOG OF TEST BORINGS" SHEET 1 OF 8

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED:	DRAWN:	CHECKED:
D. Fahrney	D. Fahrney	J. Bonfiglio

ENGINEER OF WORK R.C.E. NO. DATE

KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA. 92101 (619) 831-4600

APPROVED

PUBLIC WORKS DIRECTOR DATE

CITY OF DEL MAR

CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

SHEET 8 OF 8 SHEETS

ORIGINAL SCALE: 6 1 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1 31 1 1 1 1 1 1 1 1 4 INCHES

APPENDIX E
PREVIOUS RELEVANT GEOTECHNICAL INFORMATION BY OTHERS

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APPENDIX E
PREVIOUS RELEVANT GEOTECHNICAL INFORMATION BY OTHERS

E.1 California Department of Public Works 1960 LOTBs

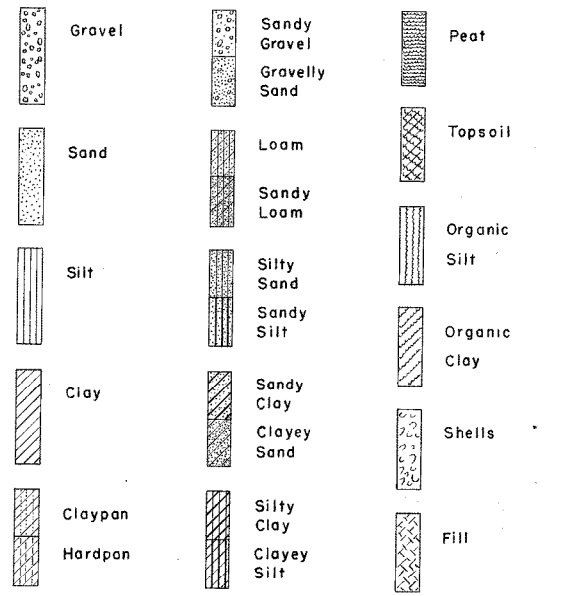
E.2 Ninyo & Moore 2018 Exploration Logs

E.3 Ninyo & Moore 2018 Laboratory Test Results

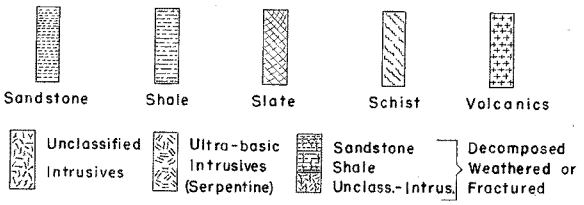
E.1 California Department of Public Works 1960 LOTBs

GEOLOGIC LEGEND

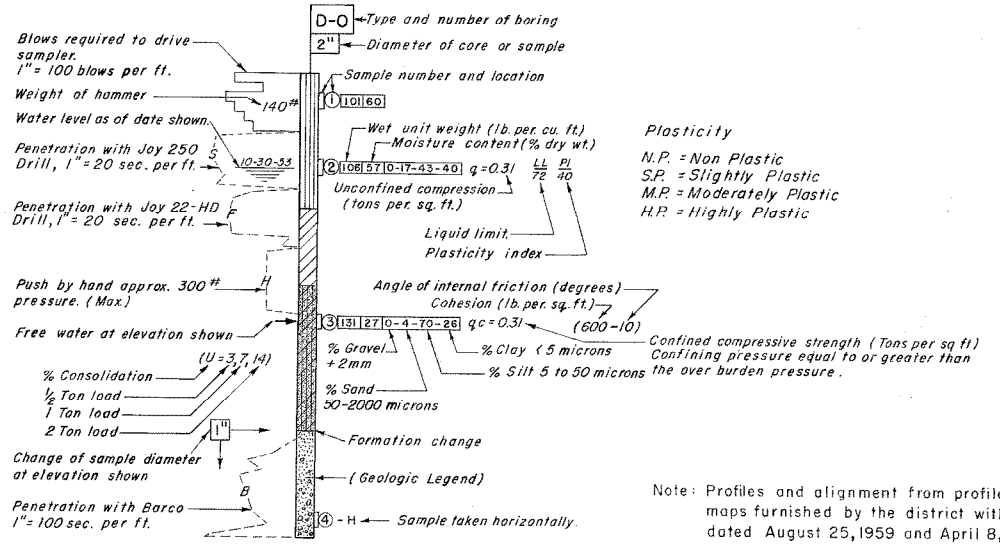
SOIL TYPES



ROCK TYPES



BORING LEGEND
CROSS-SECTION & PROFILE SHEETS



Plasticity

N.P. = Non Plastic
S.P. = Slightly Plastic
M.P. = Moderately Plastic
H.P. = Highly Plastic

Note: Profiles and alignment from profile and contour maps furnished by the district with letters dated August 25, 1959 and April 8, 1960.

NOTE - All borings are numbered consecutively regardless of type of boring

BORING LEGEND - PLAN SHEETS

●A-0	Auger (Continuous helix)	●R-0	Rotary Boring
●B-0	Bucket Boring	●J-0	Jetted Boring
●C-0	Core Boring	×V-0	Vane borer test
●C-0(E)	Electric log of Boring	■SP-0	Settlement Platform
●D-0	Drive Boring made by Hdqtrs. Lab.	▲Z-0	Piezometer
●D-0(P)	Probe Boring	⊗	2" Boring placed by Dist.
●-0	1" Boring placed by Dist.		

STATE OF CALIFORNIA DIVISION OF HIGHWAYS
MATERIALS & RESEARCH DEPARTMENT

FOUNDATION INVESTIGATION

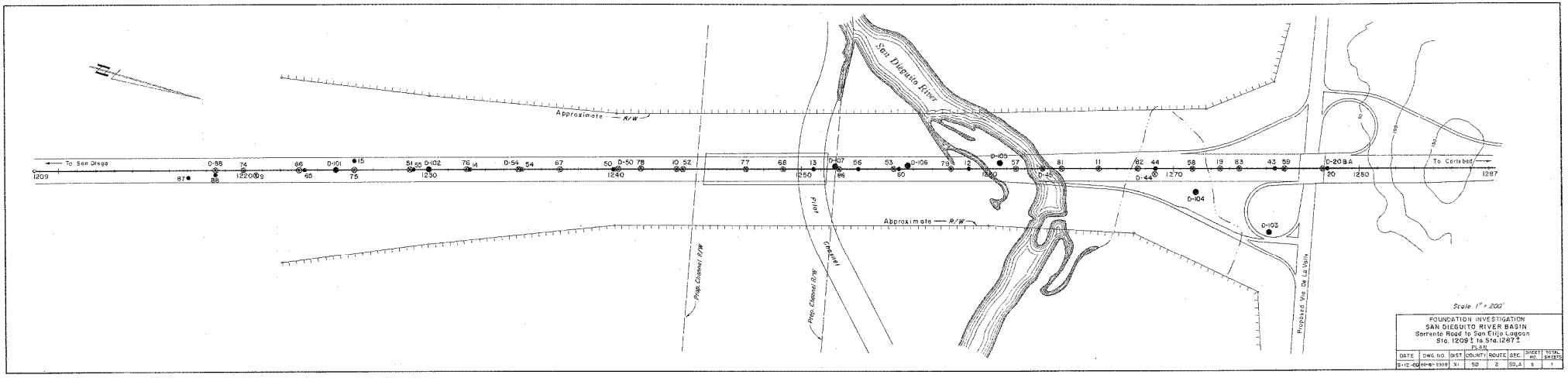
Road XI-SD-2-SD,A

Sorrento Road to San Elijo Lagoon

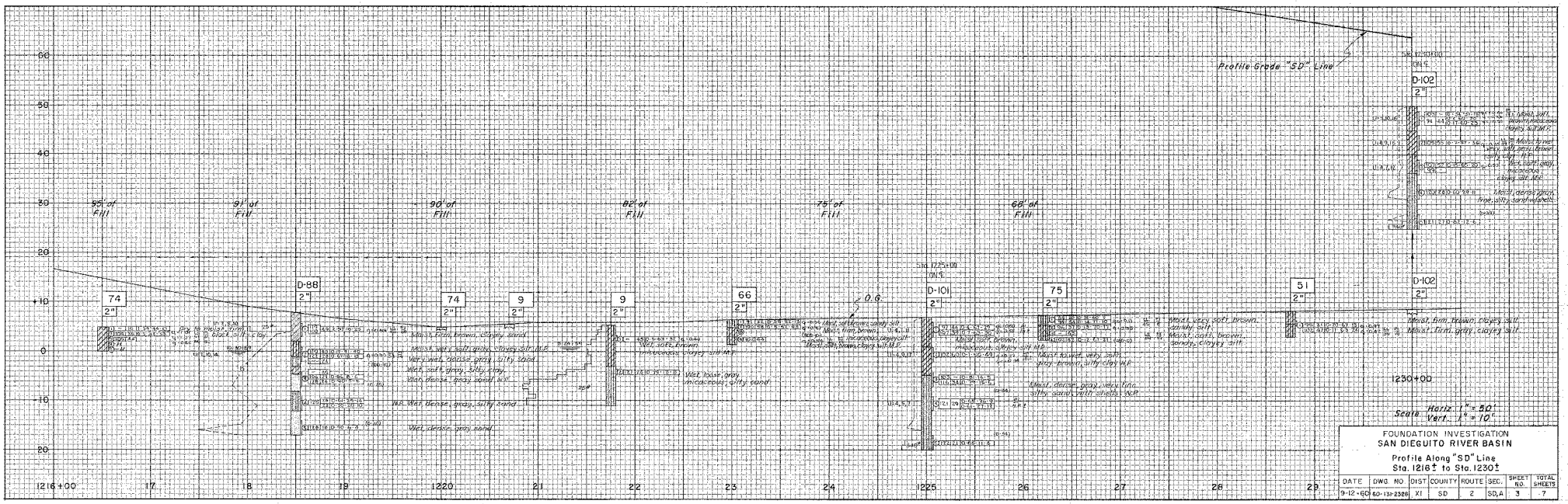
San Dieguito River Basin

LEGEND SHEET

DWG. NO. 60-130-2328	SUBMITTED BY: A. W. Root SUPV. MATERIALS & RESEARCH ENG'R.	DATE 9-12-60
DRAWN BY R.P.	APPROVED BY: F. N. Hveem MATERIALS & RESEARCH ENG'R.	SHEET NO. 1 OF 7 SHEETS
CHECKED BY W.F.K.		



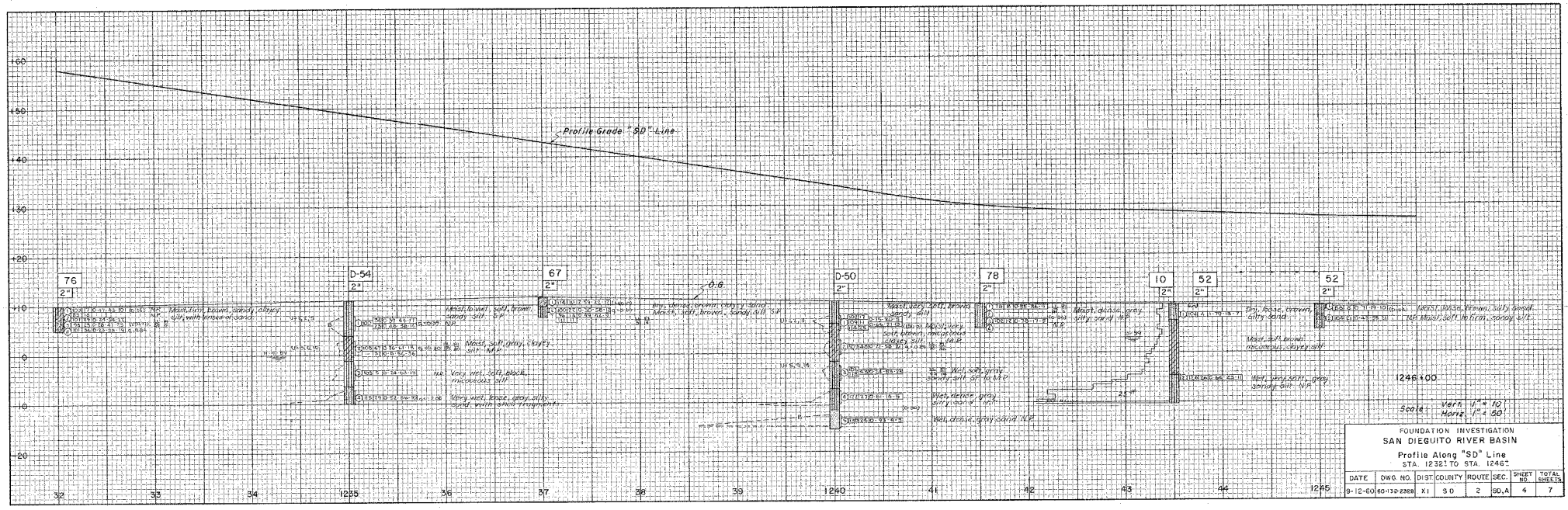
DATE	DWG. NO.	DIST	COUNTY	ROUTE	SEC	SHEET NO.	TOTAL SHEETS
9-12-62	60-GI-2308	XI	SD	2	SD.A	9	1

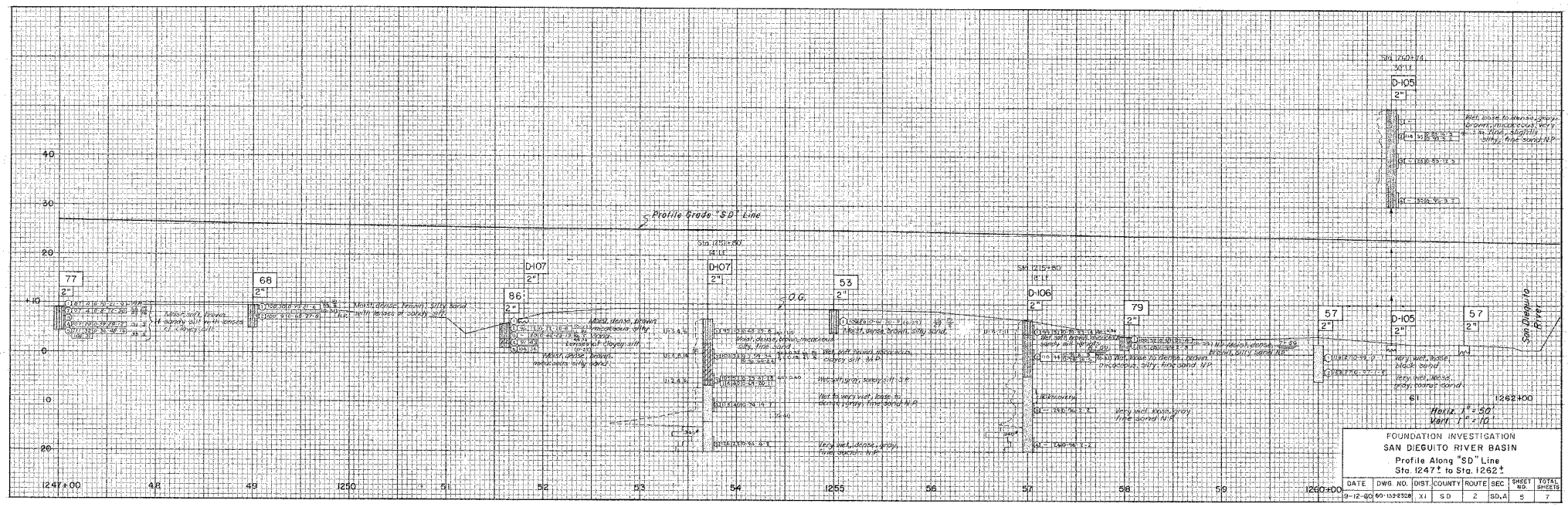


FOUNDATION INVESTIGATION
SAN DIEGUITO RIVER BASIN

Profile Along "SD" Line
Sta. 1216± to Sta. 1230±

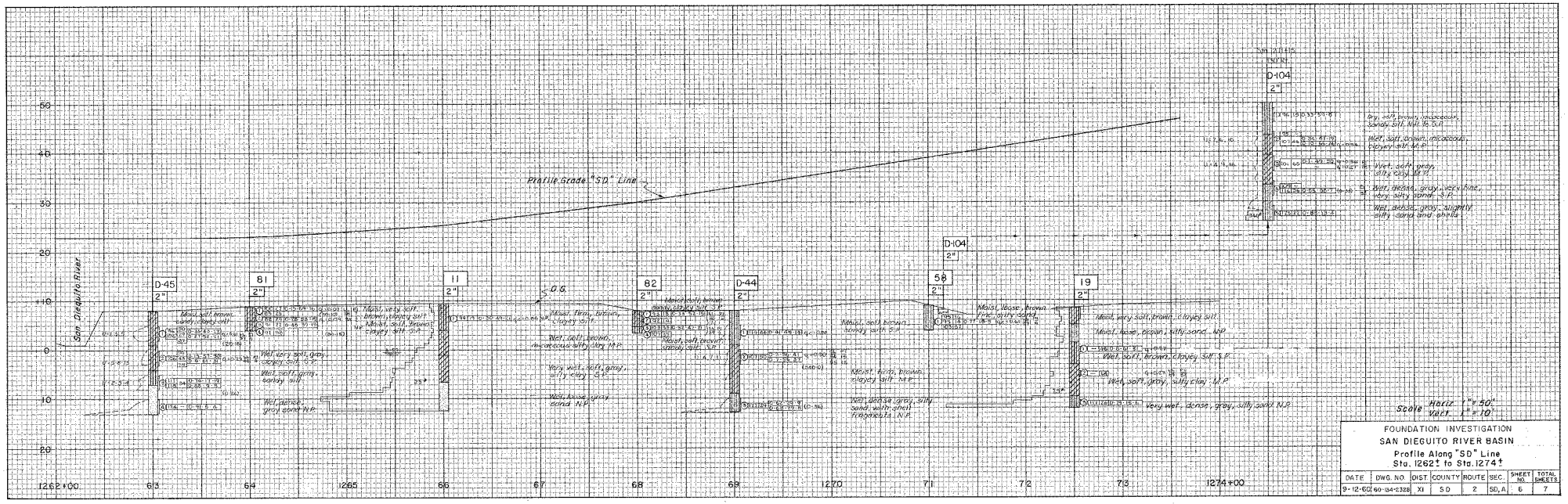
DATE	DWG. NO.	DIST	COUNTY	ROUTE	SEC.	SHEET NO.	TOTAL SHEETS
9-12-60	60-131-2326	XI	SD	2	SD,A	3	7


Profile Grade "SD" Line
76
D-54
67
D-50
78
10
52
52
1246+00
Scale
Vert 1" = 10'
Horz 1" = 50'
FOUNDATION INVESTIGATION
SAN DIEGUITO RIVER BASIN
Profile Along "SD" Line
STA. 1232+ TO STA. 1246+
DATE
DWG. NO.
DIST.
COUNTY
ROUTE
SEC.
SHEET NO.
TOTAL SHEETS
9-12-60
60-132-2388
XI
SD
2
SD,A
4
7



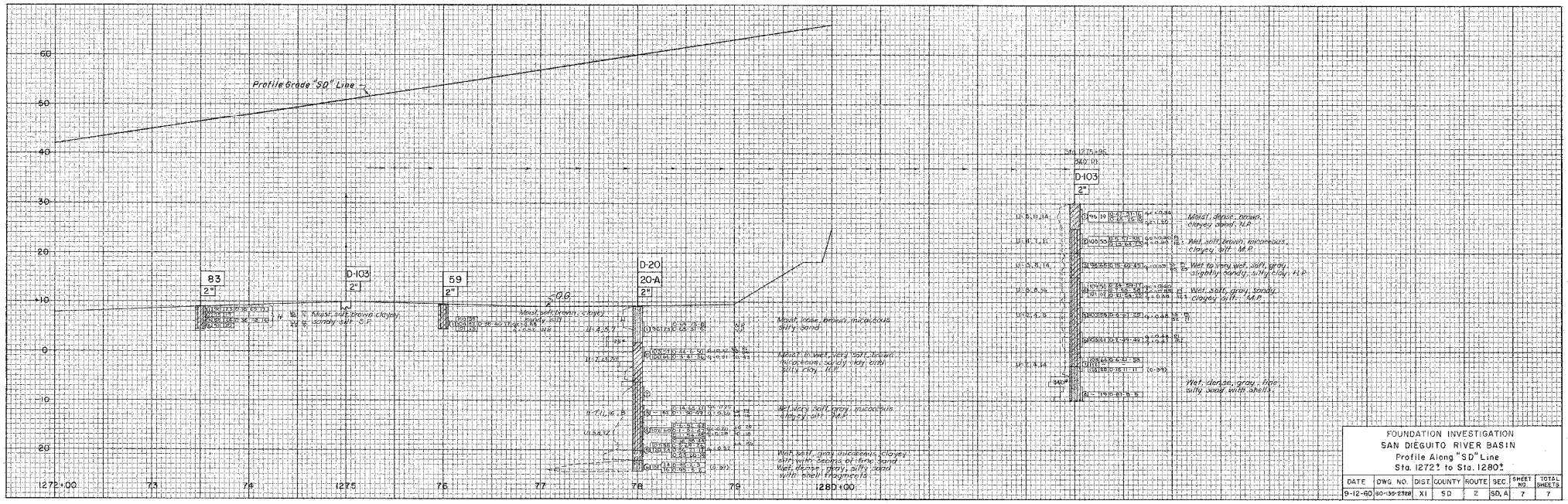
FOUNDATION INVESTIGATION
SAN DIEGUITO RIVER BASIN
Profile Along "SD" Line
Sta. 1247± to Sta. 1262±

DATE	DWG. NO.	DIST.	COUNTY	ROUTE	SEC	SHEET NO.	TOTAL SHEETS
9-12-80	60-133-2328	XI	SD	2	SD,A	5	7



FOUNDATION INVESTIGATION
SAN DIEGUITO RIVER BASIN
Profile Along "SD" Line
Sta. 1262+ to Sta. 1274+

DATE	DWG. NO.	DIST	COUNTY	ROUTE	SEC.	SHEET NO.	TOTAL SHEETS
9-12-60	60-134-2328	XI	SD	2	SD, A	6	7



FOUNDATION INVESTIGATION
SAN DIEGUITO RIVER BASIN
Profile Along "SD" Line
Sta. 1272± to Sta. 1280±

DATE	DWG. NO.	DIST.	COUNTY	ROUTE	SEC.	SHEET NO.	TOTAL SHEETS
9-12-60	60-136-2328	XI	SD	2	SD, A	7	7

STRATIOGRAPHIC SECTION
SITE PROPOSED BRIDGE OVER
SAN DIEGUITO RIVER
VII - S D - Z - A

FEB. 1931 SCALES Hor. 1"=50ft. Vert 1"=10ft

LEGEND

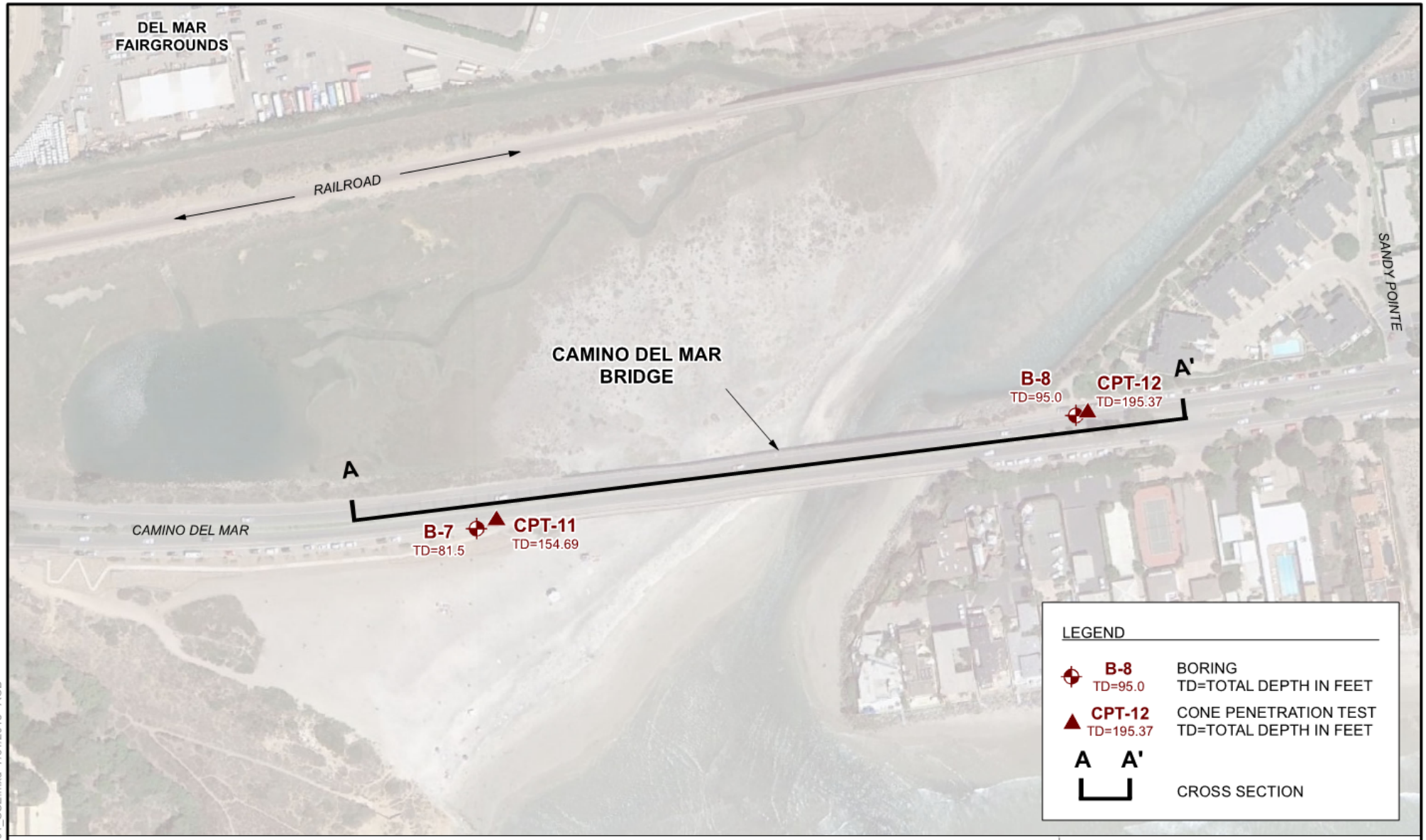
CLAY

SAND

GRAVEL

SHELLS

E.2 Ninyo & Moore 2018 Exploration Logs



SOURCE: GOOGLE EARTH, 2013.

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

N

FEET

0 200 400

2_108449001_SSE.mxd 7/31/2018 AOB

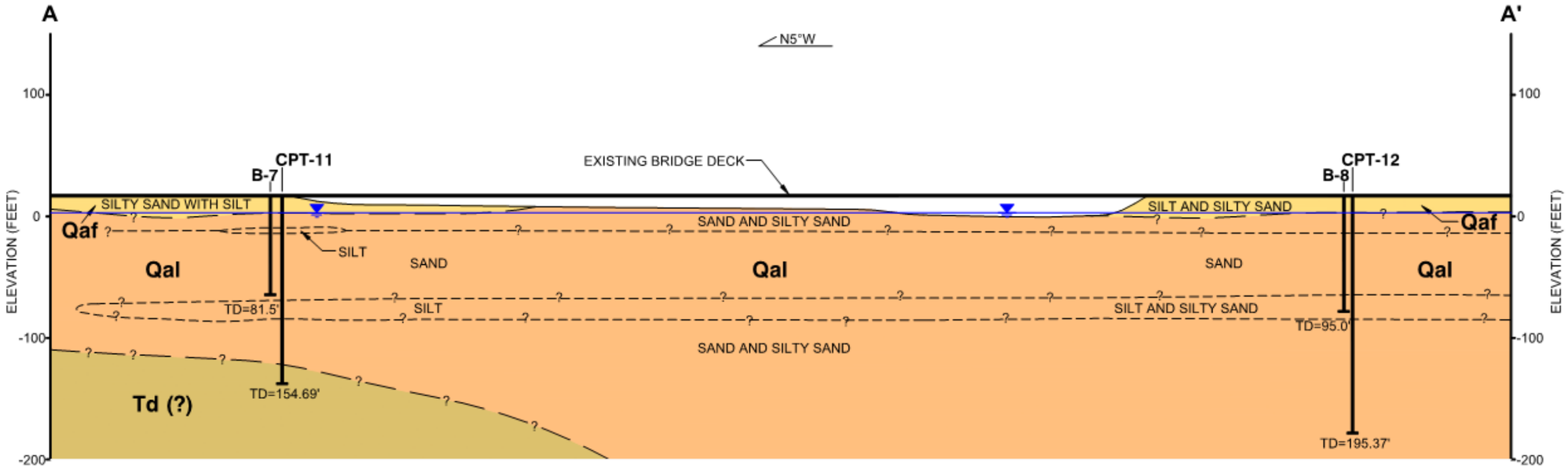
FIGURE 2

SUBSURFACE EXPLORATIONS

CAMINO DEL MAR BRIDGE REPLACEMENT
DEL MAR, CALIFORNIA

108449001 | 7/18

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants



LEGEND

B-8 (TD=95.0')	BORING TD=TOTAL DEPTH IN FEET
CPT-12 (TD=195.37')	CPT BORING TD=TOTAL DEPTH IN FEET
Qaf	FILL
Qal	ALLUVIUM
Td	DELMAR FORMATION
— ? —	GEOLOGIC CONTACT, QUERIED WHERE UNCERTAIN
▼	GROUNDWATER ELEVATION

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

N

FEET
0 100 200

4 108449001 CS A-A' DWG

FIGURE 4

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

GEOLOGIC CROSS SECTION A-A'

CAMINO DEL MAR BRIDGE REPLACEMENT
DEL MAR, CALIFORNIA

108449001 I 7/18

BENCH MARK

VERTICAL BENCHMARK: 2" CO SD BRASS DISK IN MON WELL, PC JIMMY DURANTE BOULEVARD 600 FEET NORTHEAST OF JIMMY DURANTE WAY (SOUTH) PER RECORD OF SURVEY 14492.

DATUM: NAVD88 ELEVATION: 13.32'

BASIS OF BEARINGS: THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM NAD 83, ZONE 6, EPOCH 1991.35 BETWEEN POINT NUMBERS 195 AND 459 AS SHOWN ON ROS 14492.

REFERENCE

KLEINFELDER, DATED 05/22/17.



PLAN
1"=40'

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	–	--	4	5

Soumitra Guha -/--/--
REGISTERED CIVIL ENGINEER DATE

REGISTERED PROFESSIONAL ENGINEER * SOUMITRA GUHA No. GE 2632 EXP. 06/30/19 GEOTECHNICAL * STATE OF CALIFORNIA

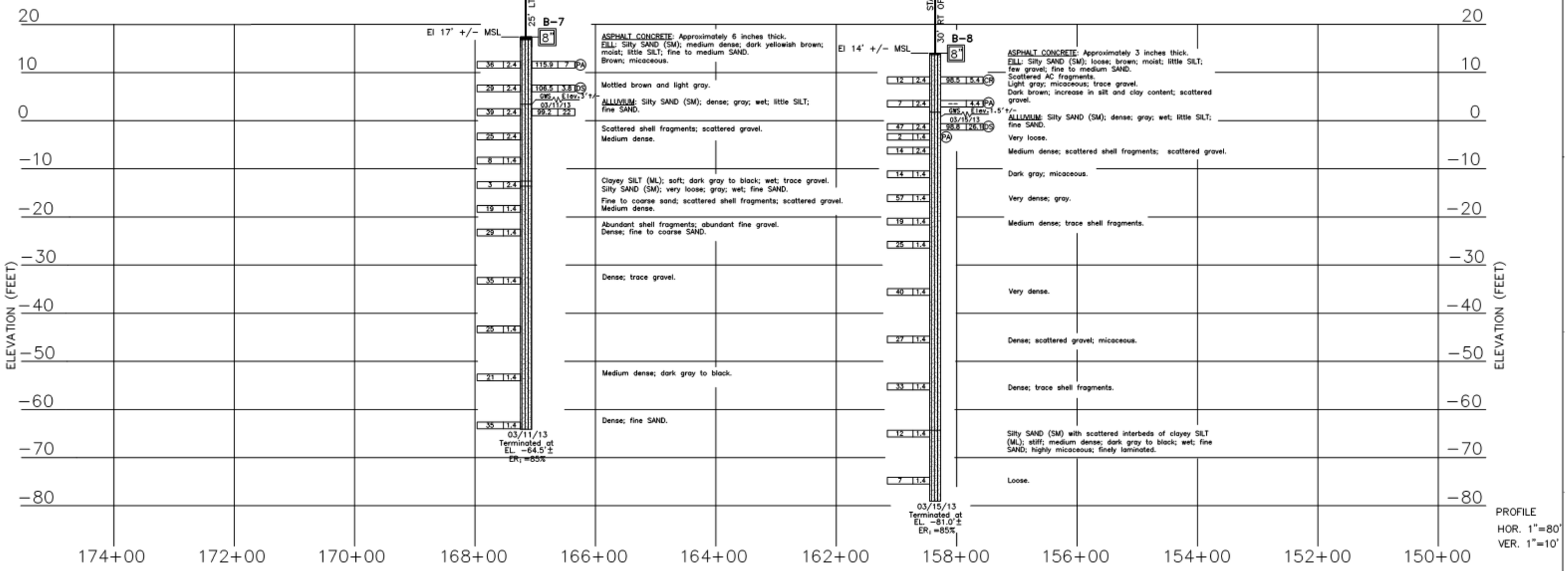
PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of scanned copies of this plan sheet.

--

NINYO & MOORE
5710 Ruffin Road
San Diego, CA 92123
Phone (858) 576-1000

NOTES:
1. THIS LOG OF TEST BORINGS WAS PREPARED IN ACCORDANCE WITH THE CALTRANS SOIL & ROCK LOGGING CLASSIFICATION, AND PRESENTATION MANUAL (2010).
2. 2.4" SAMPLES WERE TAKEN WITH A CALIFORNIA MODIFIED SAMPLER AND 1.4" SAMPLES WERE TAKEN WITH A STANDARD PENETRATION TEST (SPT) SAMPLER.
3. AN AUTOMATIC TRIP HAMMER SYSTEM CONSISTING OF A HAMMER WEIGHT OF 140 LBS. FALLING FROM A HEIGHT OF 30" WAS USED TO ADVANCE THE DRIVE SAMPLES.



-- DESIGN OVERSIGHT	DRAWN BY	ALEXIS BALANE	NINYO & MOORE FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	-- PROJECT ENGINEER	BRIDGE NO. 57C-0209	CAMINO DEL MAR BRIDGE REPLACEMENT
SIGN OFF DATE	CHECKED BY	SOUMITRA GUHA	DATE: 03/11/13, 03/13/13, AND 03/15/13			POST MILES --	LOG OF TEST BORINGS

GS CIVIL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU: --
EA: --

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES				SHEET	OF
1				4	5

BENCH MARK

VERTICAL BENCHMARK: 2" CO SD BRASS DISK IN MON WELL, PC JIMMY DURANTE BOULEVARD 600 FEET NORTHEAST OF JIMMY DURANTE WAY (SOUTH) PER RECORD OF SURVEY 14492.

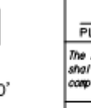
DATUM: NAVD88 ELEVATION: 13.32'

BASIS OF BEARINGS: THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM NAD 83, ZONE 6, EPOCH 1991.35 BETWEEN POINT NUMBERS 195 AND 459 AS SHOWN ON ROS 14492.

REFERENCE

KLEINFELDER, DATED 05/22/17.





DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
11	SD	–	--	5	5

Soumitra Guha --/--/--
REGISTERED CIVIL ENGINEER DATE

REGISTERED PROFESSIONAL ENGINEER
SOUMITRA GUHA
No. GE 2632
Exp. 06/30/19
GEOTECHNICAL
STATE OF CALIFORNIA

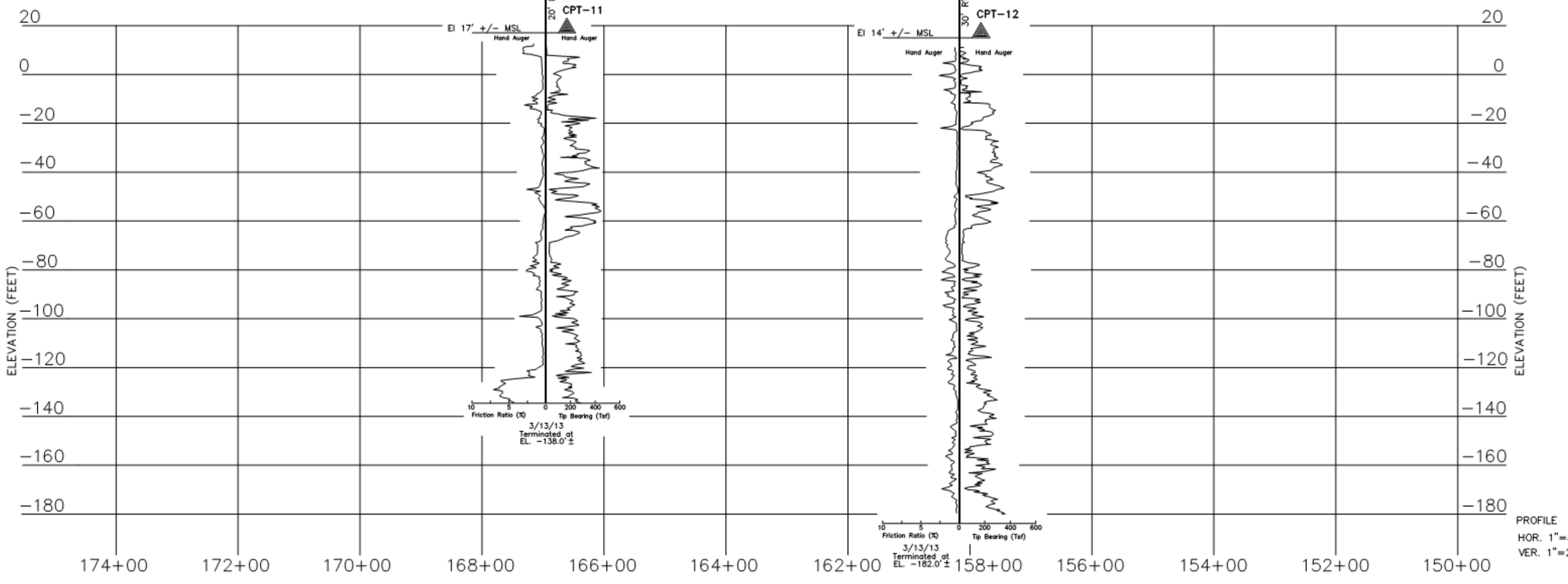
PLANS APPROVAL DATE

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NINYO & MOORE
5710 Ruffin Road
San Diego, CA 92123
Phone (858) 576-1000

NOTES:
1. THIS LOG OF TEST BORINGS WAS PREPARED IN ACCORDANCE WITH THE CALTRANS SOIL & ROCK LOGGING CLASSIFICATION, AND PRESENTATION MANUAL (2010).
2. 2.4" SAMPLES WERE TAKEN WITH A CALIFORNIA MODIFIED SAMPLER AND 1.4" SAMPLES WERE TAKEN WITH A STANDARD PENETRATION TEST (SPT) SAMPLER.
3. AN AUTOMATIC TRIP HAMMER SYSTEM CONSISTING OF A HAMMER WEIGHT OF 140 LBS. FALLING FROM A HEIGHT OF 30" WAS USED TO ADVANCE THE DRIVE SAMPLES.



-- DESIGN OVERSIGHT	DRAWN BY	ALEXIS BALANE	NINYO & MOORE	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	-- PROJECT ENGINEER	BRIDGE NO. 57C-0209	CAMINO DEL MAR BRIDGE REPLACEMENT
SIGN OFF DATE	CHECKED BY	SOUMITRA GUHA	FIELD INVESTIGATION BY: DATE: 03/11/13, 03/13/13, AND 03/15/13			POST MILES --	LOG OF TEST BORINGS

GS CIVIL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

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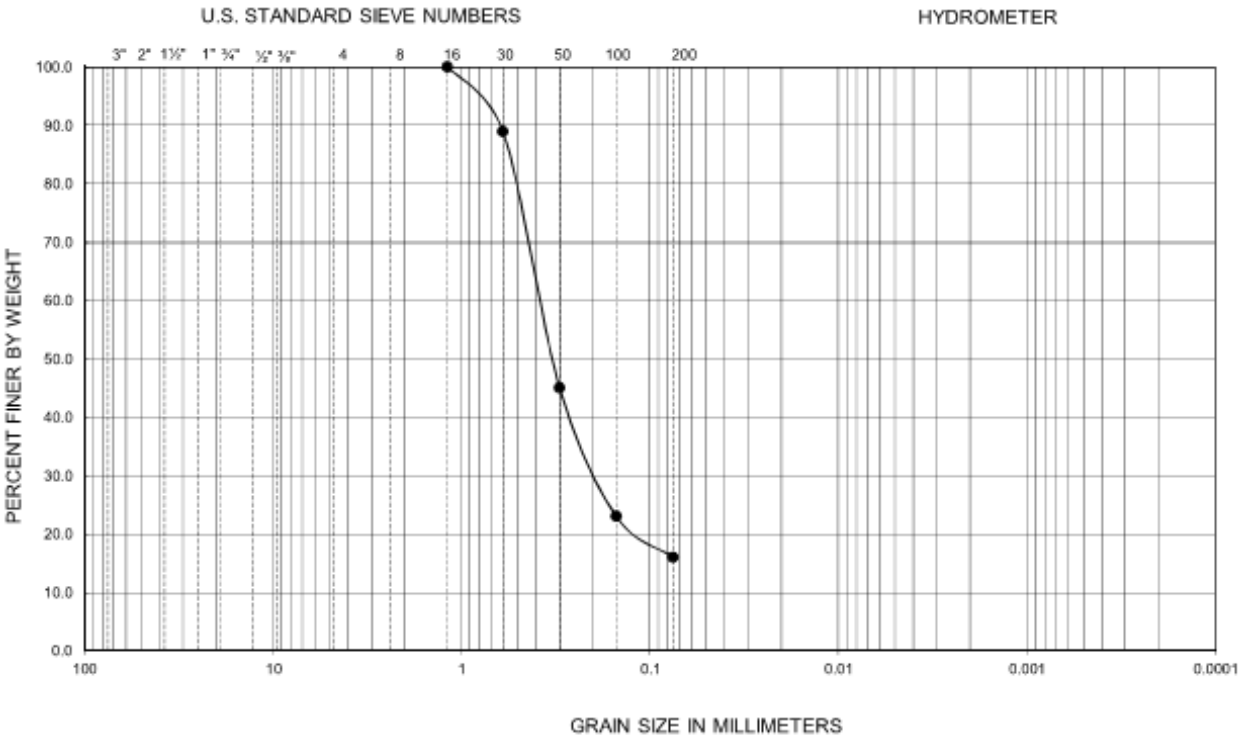
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES

SHEET 5 OF 5

E.3 Ninyo & Moore
2018 Laboratory
Test Results

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



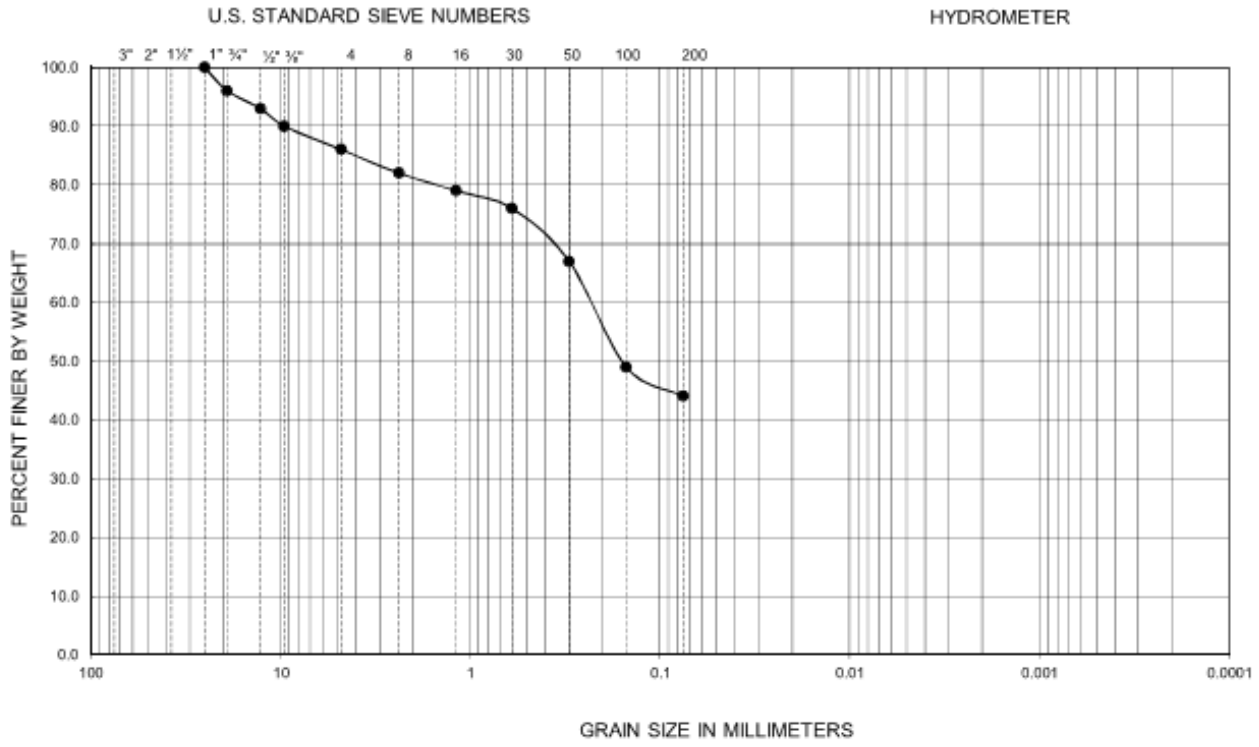
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	USCS
●	B-7	5.0-6.5	--	--	--	--	--	--	--	--	16	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-1
108449001 / 7/18		

108449001_SIEVE B-7 @ 5.0-6.5.xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY

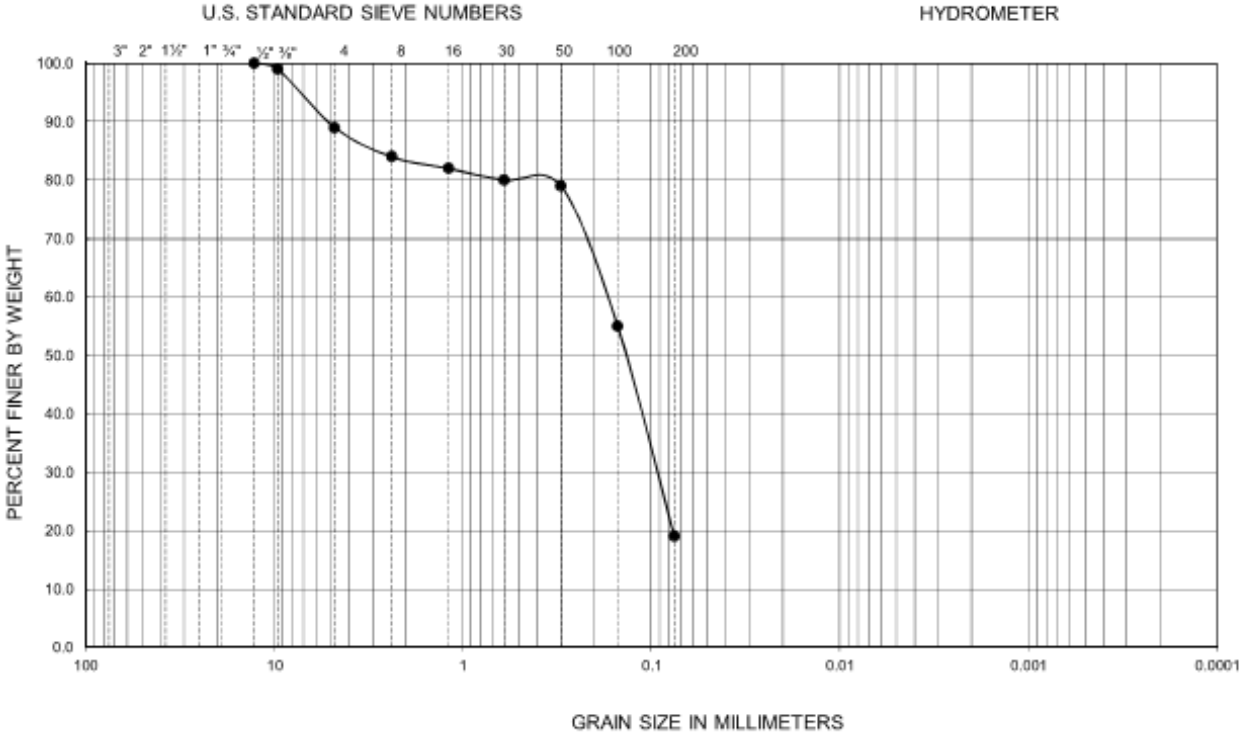


Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	USCS
●	B-8	10.0-11.5	--	--	--	--	--	--	--	--	44	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. 108449001 / DATE 7/18	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-2

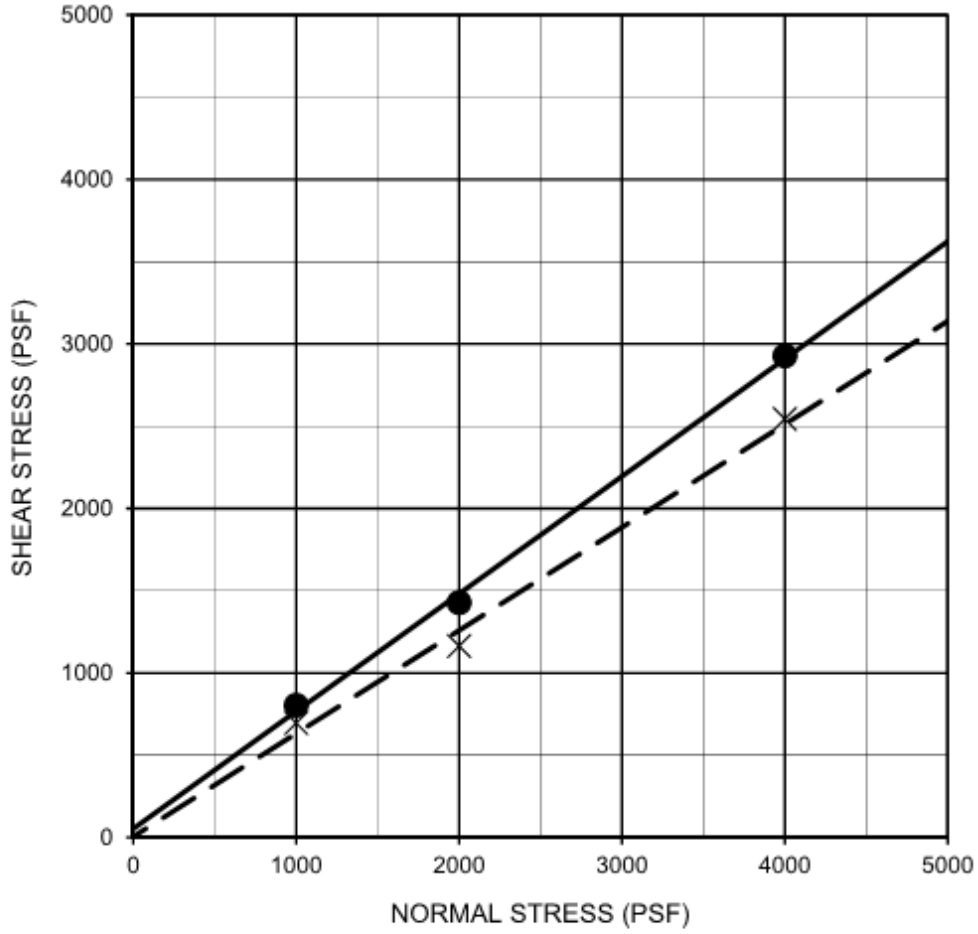
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	USCS
●	B-8	17.0-18.5	--	--	--	--	--	--	--	--	19	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

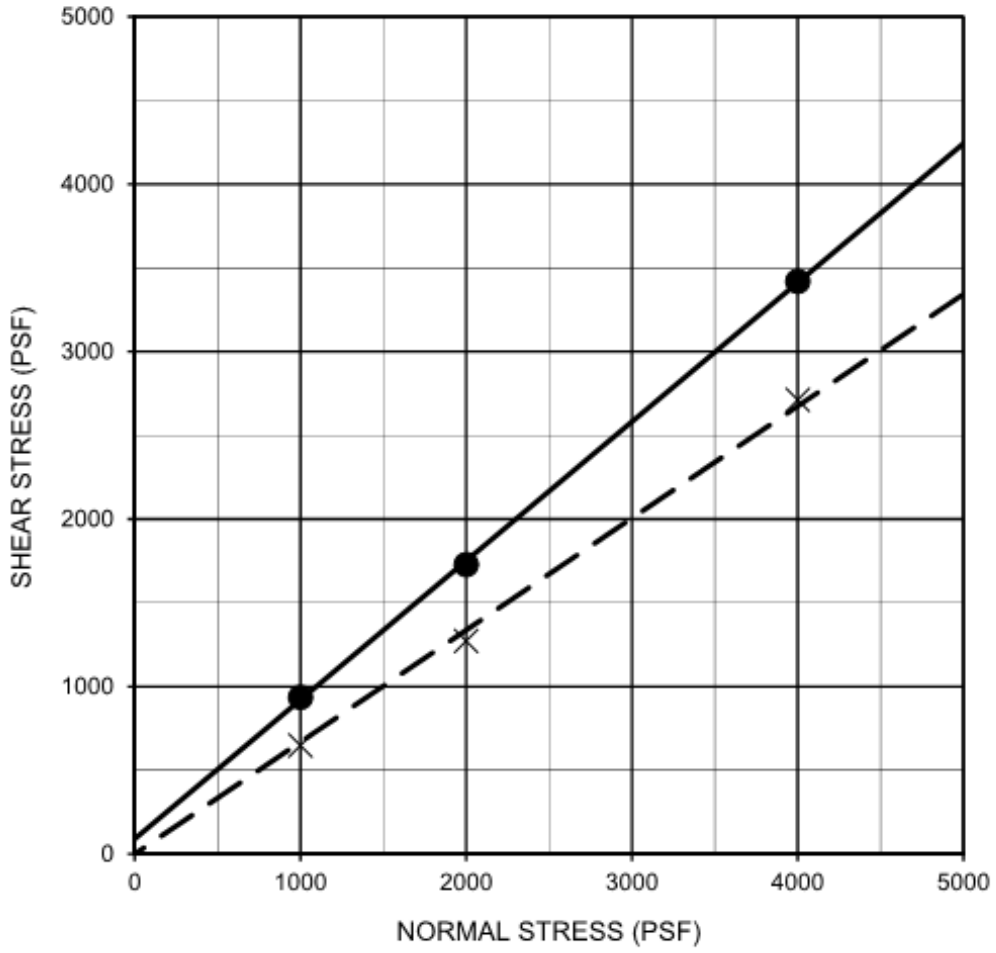
Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. 108449001 / DATE 7/18	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-3



Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
Silty SAND	—●—	B-7	10.0-11.5	Peak	50	36	SM
Silty SAND	- - x - -	B-7	10.0-11.5	Ultimate	10	32	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

Ninyo & Moore	DIRECT SHEAR TEST RESULTS	FIGURE
PROJECT NO. / DATE	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-4
108449001 / 7/18		



Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
Silty SAND	—●—	B-8	15.0-16.5	Peak	90	40	SM
Silty SAND	– – X – –	B-8	15.0-16.5	Ultimate	0	35	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

Ninyo & Moore	DIRECT SHEAR TEST RESULTS	FIGURE
PROJECT NO. 108449001 / DATE 7/18	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-5

SAMPLE LOCATION	SAMPLE DEPTH (FT)	pH [1]	RESISTIVITY [1] (Ohm-cm)	SULFATE CONTENT [2]		CHLORIDE CONTENT [3] (ppm)
				(ppm)	(%)	
B-8	5.0-6.5	8.4	10,000	40	0.004	50

[1] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643
[2] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417
[3] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

Ninyo & Moore	CORROSIVITY TEST RESULTS	FIGURE
PROJECT NO. 108449001 / DATE 7/18	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-6

APPENDIX F
SITE RESPONSE ANALYSIS

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APPENDIX F
SITE RESPONSE ANALYSIS

INTRODUCTION

This appendix presents the results of Kleinfelder's site response analysis for the Camino Del Mar Bridge Replacement project over the San Dieguito River in Del Mar, California. Based on the results of our current subsurface investigation, previous subsurface investigations by others, and preliminary engineering analyses, there is a significant liquefaction hazard at the site. Accordingly, the project site is classified as Soil Profile Type F per the 2019 Caltrans Seismic Design Criteria (SDC) V2.0 (Caltrans, 2019). Therefore, Caltrans SDC requires that a site response analysis be performed.

The purpose of this analysis is to develop a site-specific design acceleration response spectrum in accordance with the requirements of the 2019 Caltrans SDC V2.0 and the American Association of State Highway Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications, 8th Edition, with California Amendments (Caltrans, 2019). The site-specific design acceleration response spectrum developed from this analysis will be used for the seismic design of the proposed replacement bridge and other ancillary structures at the site.

The site response analysis relies upon data from the field and laboratory investigations completed for the project as presented in Sections 2 and 3 and in Appendices A through E of this report.

Project Understanding

As discussed in Section 1.4 of this report, the proposed project is still in the bridge type selection phase and five bridge options are still currently being considered for replacement of the existing Camino Del Mar Bridge which spans the San Dieguito River channel. These alternatives consist of three 5-span and 6-span cast-in-place box girder bridge options as well as two 6-span precast concrete girder bridge options. Large diameter Cast-In-Drilled-Hole (CIDH) type piles with permanent steel casing are recommended for support of the piers and abutments of the proposed replacement bridge. Ancillary structures proposed for the project include Caltrans Standard cantilever-type retaining walls along each side of the northern and southern bridge approaches. These retaining walls will support new approach fill in order to raise grades for to accommodate the design storm water level.

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Based on discussions with the project structural engineer, we understand that the longitudinal and transverse fundamental periods of the proposed bridge alternatives range from approximately 0.5 to 1.4 seconds and 0.7 to 1.3 seconds, respectively, for the various alternatives.

At this time, it is our understanding that ground motion time histories will not be needed for structural design.

Project Location

We have used the approximate coordinates near the center of the bridge as the control point for the seismic hazard analysis. The coordinates of the approximate center of the bridge structure are:

Latitude: 32.9750° N Longitude: 117.2690° W

Material properties and other parameters used were selected to be representative of the response of the site as a whole to ground motions based on the preliminary field explorations performed at the project site.

Approach

This site response analysis was performed in general accordance with the requirements of the 2019 Caltrans SDC V2.0 and the AASHTO LRFD Bridge Design Specifications (BDS), 8th Edition, with California Amendments. The scope of this analysis includes the following:

- Review of subsurface conditions impacting the seismic hazards at the site including geology and subsurface stratigraphy and seismic hazards at the site;
- Development of a horizontal response spectrum at the base of the soil column which serves as the target spectrum in selection of ground motions to be used for the site response analysis. The target spectrum was developed for the 975-year return period ground motion level using an appropriate V_{S30} value in accordance with Caltrans SDC;
- Deaggregation analyses of the hazard to estimate the controlling seismic source(s) associated with the period ranges of interest for the target spectrum;
- Selection and modification of seven acceleration time histories per AASHTO LRFD BDS based on the target spectral shape, earthquake magnitude, distance, and frequency content from historical earthquake records;
- Spectral matching of the selected time histories to the developed target spectrum;

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- Development of soil properties to be used in the site response analysis;
- Site response analysis using appropriate equivalent linear and nonlinear models in accordance with Caltrans guidelines and the AASHTO LRFD BDS; and
- Development of the site-specific design acceleration response spectrum in accordance with the requirements of Caltrans guidelines and the AASHTO LRFD BDS.

The scope of this analysis is subject to the limitations provided in Section 7 of the main report.

SUBSURFACE CHARACTERIZATION

Subsurface characterization was developed to support the site response analysis and is based on the results of the current and previous subsurface investigations as discussed in Section 3 of the main report.

Subsurface Geology and Stratigraphy

The project site is generally underlain by an upper layer of Recent Alluvial Deposits (Qa) overlying successive strata of Young Alluvial Deposits (Qya), Young Estuarine Deposits (Qyes), Old Alluvial Deposits (Qoa), and the Del Mar Formation (Td). Further details regarding the characteristics and conditions of each of these geologic units are provided in Section 3 of the main report.

Based on the results of the geotechnical investigations performed at the site, a generalized best estimate profile of material properties was developed for use in the site response analysis and is presented below in Table F-1. These material properties were developed based on in-situ testing which included performing a Seismic Cone Penetrometer Test (SCPT), Cone Penetrometer Testing (CPTs), exploratory borings, and laboratory testing as well as our experience with similar materials in the project vicinity.

Table F-1

Material Properties for Site Response Analysis

Layer No.	Geologic Unit	Dominant Soil Type	Layer Thickness (ft)	Unit Weight (pcf)	Friction Angle (deg)	At-Rest Earth Pressure, Ko	Plasticity Index, PI
1	Qa	Sand (Loose)[1]	12	120	28	0.53	0
2		Clay (Soft)	7	110	18	0.69	40

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Table F-1 (Continued)

Material Properties for Site Response Analysis

Layer No.	Geologic Unit	Dominant Soil Type	Layer Thickness (ft)	Unit Weight (pcf)	Friction Angle (deg)	At-Rest Earth Pressure, Ko	Plasticity Index, PI
3		Sand (Loose)[1]	16	120	28	0.53	0
4	Qya	Sand (Med. Dense)[1]	30	125	32	0.47	1
5	Qyes	Clay (Stiff)	16	115	22	0.63	30
6	Qoa	Sand (Med. Dense to Dense)	55	125	34	0.44	1
7	Qoa/Td	Gravelly Sand (Very Dense) and Claystone / Sandstone (Very Dense / Very Stiff)	Half Space	135	-	-	-

Notes:
[1]Potentially liquefiable layers based on results of field investigation and liquefaction triggering analyses as presented in Section 4.1.2 of the main report.
[2]Material parameters and layering selected to represent best estimate for seismic site response and may not be appropriate for other geotechnical evaluations.

Site Class

Due to the potential of extensive liquefaction in the recent and young alluvial deposits at the site as discussed in Section 4.1.2 of this report, the site is classified as a Soil Profile Type F site and site response analysis is required per the SDC.

However, for the purpose of comparing the design spectrum with general response spectrum per AASHTO, site class was evaluated in accordance with the requirements of the Caltrans SDC V2.0 and the AASHTO LRFD BDS, 8th Edition, with California Amendments (Caltrans, 2019). The average shear wave velocity in the upper 100 feet (e.g. V_{S30}) was evaluated using data from the SCPT performed at the CPT-20-003 location. The results of the SCPT are provided on Figure F-1 and further details are provided in Appendix B of this report.

Using the SCPT data, the average shear wave velocity in the upper 100 feet was estimated to be of 711 ft/s (216 m/s), which is consistent with a Soil Profile Type D site classification per Caltrans SDC.

DEVELOPMENT OF BASE GROUND MOTIONS

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Development of base ground motions include developing target response spectrum at the base of the soil column and then selecting and developing spectrally matched time histories to be used for performing site response analysis. Details of the target spectrum and time history development are discussed in the subsequent sections.

Target Spectrum Development

The target acceleration response spectrum at the base of the soil column was obtained from the Caltrans ARS Online V3.0.1 tool. The Caltrans ARS Online tool provides the probabilistic design response spectrum based on the United States Geological Survey (USGS) 2014 National Seismic Hazard Maps for a 975-year return period (Petersen et al., 2014). Inputs for the ARS Online tool include the site's coordinates, in which we used the site's coordinates for the approximate center of the bridge, as well as the V_{S30} value. For the target spectrum, a V_{S30} value consistent with soil conditions at the base of the soil column was used. In general, where bedrock is shallow, base of the soil column is located at the bedrock. However, for this site, bedrock is relatively deep, therefore, we have selected our base at a certain depth beyond which the shear wave velocity is quite consistent and reflective of competent materials. Based on this, for our site response analysis, the base of the soil column is located at a depth of approximately 136 feet from the ground surface within the river channel, or at an approximate elevation of -134 ft NAVD88. Based on shear wave velocity values obtained at that elevation in the SCPT performed at the site, a V_{S30} value of 1,000 ft/s (315 m/s) was used for development of the target spectrum.

The target response spectrum for a 975-year return period, using a V_{S30} value of 1,000 ft/s, obtained from the Caltrans ARS Online tool is provided in Table F-2 and Figure F-2. This target spectrum was adjusted for near fault amplification based on the proximity of the site to the controlling Rose Canyon fault in accordance with Caltrans SDC requirements.

Table F-2

Caltrans ARS Online Target Response Spectrum

Period	Near Fault Amplification Factor	Probabilistic Spectral Acceleration (g)
0.01 (PGA)	1	0.43
0.1	1	0.75
0.2	1	1.01
0.3	1	1.06

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Table F-2 (Continued)

Caltrans ARS Online Target Response Spectrum

Period	Near Fault Amplification Factor	Probabilistic Spectral Acceleration (g)
0.5	1	0.92
0.75	1.1	0.78
1.0	1.2	0.66
2.0	1.2	0.32
3.0	1.2	0.2
4.0	1.2	0.14
5.0	1.2	0.1

Time History Selection and Spectral Matching

Using the target response spectrum provided in Figure F-2 and Table F-2, a suite of seven time histories were selected from the PEER Strong Ground Motion Database (PEER, 2014) and spectrally matched for use in the site response analysis in accordance with AASHTO and Caltrans. The time histories were selected based on several criteria including near-fault pulse motions, scaling factor, site-to-source distance, magnitude, V_{S30}, arias intensity, duration, style of faulting, shape of response spectrum, etc. These time histories were selected and modified for use in site response analysis only and may not be appropriate for other applications.

Due to the site's close proximity to the Rose Canyon fault, both pulse and non-pulse motions were considered during selection of time histories as required by AASHTO guidelines. Based on the methodology presented in Hayden et al. (2014), the distance from the site to the Rose Canyon fault, and the epsilon value of the spectral acceleration at a period of 1 second, we estimated that the proportion of pulse motions to be selected for the site response analysis is three to four pulse motions out of seven, with the remainder being non-pulse motions.

Consideration was also given to the controlling earthquake sources over various period ranges considering the results of the USGS deaggregation of the probabilistic seismic hazard. Based on the deaggregation results, the shorter period (higher frequency) range of the target spectrum is controlled primarily by events associated with the near (less than 15 km away) to mid-field range such as the nearby Rose Canyon fault at approximately 2.2 miles (3.6 km) west of the site as well as the Oceanside fault and Coronado Bank fault at approximately 11 miles (17.7 km) and

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16.5 miles (26.5 km) west of the site, respectively. Longer period ranges were also controlled by these near to mid-field events but also had contributions from farther events such as those associated with the Elsinore fault at 29.5 miles (47.4 km) east of the site and the San Jacinto fault at 54 miles (87 km) east of the site. The style of faulting associated with these controlling sources include strike-slip and reverse/oblique faulting. Based on these results, we evaluated a suite of ground motions considering primarily near to mid-field events for strike-slip and reverse/oblique sources in order to understand the range of responses likely to occur.

Other selection parameters included magnitude and V_{S30}, in which time histories relatively close to the probabilistic mean magnitude of 6.65 and V_{S30} value of 1,000 ft/s for the target spectrum were selected. Considerations for arias intensity and duration of the ground motions used the methodologies of Travasarou et al. (2003) and Bommer et al. (2009) for selection of ground motions in relation to these parameters.

Based on these criteria, a suite of seven time histories was selected from the PEER database that had a spectral shape after scaling (scaling factors less than 3) generally in good agreement with the target response spectrum. These selected ground motion time histories and their associated characteristics are provided in Table F-3.

Table F-3

Selected Time Histories from PEER Database

Record No.	Event Name	Year	M_w	Distance, R_{Rup} (km)	V_{S30} (m/s)	Faulting Mechanism	D_{5-95} (sec)	I_A (m/s)	LUF (Hz)	Pulse Period	Scaling Factor
RSN 725	Superstition Hills-02	1987	6.54	11.16	316.64	SS	13.7	2.1	0.1625	-	1.6
RSN 767	Loma Prieta	1989	6.93	12.82	349.85	RO	11.4	2.1	0.125	2.64	1.4
RSN 1045	Northridge-01	1994	6.69	5.48	285.93	R	8.8	1.5	0.125	2.98	1.2
RSN 1119	Kobe, Japan	1995	6.9	0.27	312	SS	4.6	3.9	0.1625	1.81	0.8
RSN 1605	Duzce, Turkey	1999	7.14	6.58	281.86	SS	11.1	2.9	0.1	5.94*	0.9
RSN 3756	Landers	1992	7.28	40.67	368.2	SS	32.9	1	0.05	-	2.9
RSN 6923	Darfield, NZ	2010	7	30.53	255	SS	20.1	1.6	0.2	-	1.6

Notes: Definitions: M_w – Moment Magnitude; R - Reverse fault; RO – Reverse Oblique fault; SS – Strike-slip fault; D_{5-95} – Significant Duration; I_A – Arias Intensity; LUF – Lowest Usable Frequency
*Pulse motion as defined by Shahi and Baker (2014). This time history is not identified as a pulse motion in the PEER database.

The selected ground motions from the PEER database were then modified by performing spectral matching using the RSPMatch program developed by Atik and Abrahamson (2010) as implemented in the computer program EZ-FRISK™ (Risk Engineering, 2018) which generally

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implements the spectral matching algorithm proposed by Lilhanand and Tseng (1987, 1988) with an updated wavelet adjustment to preserve the non-stationary characteristics of the ground motions. Spectral matching was completed such that the resulting spectrum was generally in good agreement with the target spectrum particularly over the period range of interest. The spectrally matched ground motions were compared with the PEER database original ground motions to ensure that the matching process retained the non-stationary characteristics of the record.

Figures presenting the selected matched time histories used as the “outcrop” ground motions in the site response analysis, along with the original time histories as obtained from the PEER database, are provided on Figures F-3 through F-9. The matched spectra and average of the matched spectra compared to the target spectrum is shown on Figure F-10.

SITE RESPONSE ANALYSIS

Site response analysis was completed for the site in accordance with the 2019 Caltrans SDC V2.0 and the AASHTO LRFD BDS, 8th Edition, with California Amendments. Evaluations were completed using the selected, matched time histories as the outcrop motions in conjunction with one-dimensional total stress nonlinear (without porewater pressure generation) and equivalent linear response history analyses using the computer program DEEPSOIL v7.0 (Hashash et al., 2020). Results of the site response analysis were used to develop the site-specific design acceleration response spectrum for the project. Details of the site response analysis methodology and results are presented in the subsequent sections.

Representative Soil Profile and Analysis Approach

For the site response analysis, the material properties and generalized soil layering discussed previously were adopted with soil parameters assigned as shown in Table F-4. The various soil layers were fit to the appropriate modulus reduction and damping curves as shown in Table F-4. In fitting the modulus reduction and damping curves, the general quadratic / hyperbolic (GQ/H) strength controlled constitutive model of Groholski et al. (2015) was used as this model is able to account for the small strain behavior and shear strength of the soil. The soil layers were subdivided into sub-layers to allow for higher maximum frequencies to pass through the layers. The number and thickness of the sub-layers are also provided in Table F-4. It should be noted that generation of excess pore pressures for the potentially liquefiable soils at the site were not considered in the site response analysis in accordance with guidance provided in communications

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with Caltrans. In addition, shear strengths in potentially liquefiable materials were not reduced for site response analysis.

Table F-4

GQ/H Model Soil Parameters for Site Response Analysis

Layer No.	Geologic Unit	Dominant Soil Type	Modulus Reduction / Damping[1]	Layer Thickness (ft)	No. of Sub Layers (Thickness)	Maximum Freq. Passing (Hz)	Vs (fps)
1	Qa	Sand (Loose)[1]	Darendeli (2001)	12	6 (2 ft)	81.3	650
2		Clay (Soft)	Darendeli (2001)	7	2 (3.5 ft)	42.9	600
3		Sand (Loose)[1]	Darendeli (2001)	16	8 (2 ft)	81.3	650
4	Qya	Sand (Med. Dense)[1]	Darendeli (2001)	30	10 (3 ft)	62.5	750
5	Qyes	Clay (Stiff)	Darendeli (2001)	16	4 (4 ft)	43.8	700
6	Qoa	Sand (Med. Dense)	Darendeli (2001)	55	11 (5 ft)	42.5	850
7	Qoa/Td	Gravelly Sand (Very Dense) and Claystone / Sandstone (Very Dense / Very Stiff)	Half Space				1,000

Notes:
[1]Potentially liquefiable layers based on results of field investigation and liquefaction triggering analyses as presented in Section 4.1.2 of the main report.
[2]Modulus Reduction and Damping curves used in fitting of model parameters. Shear strengths for fitting routine taken using cohesion and friction angles shown previously.

The GQ/H model uses shear strength which varies with depth to model large-strain behavior of the soil. The shear strength used in the GQ/H model is the judgement-based shear strength developed at 0.1 percent shear strain for a linear elastic material with 80 percent of the maximum shear modulus derived from the shear wave velocity of the soil layer as defined in Hashash et al. (2020). Viscous small strain damping used a frequency independent formulation implemented in DEEPSOIL as recommended by Hashash et al. (2020). The selected ground motions were modeled as “outcrop” motions at the base of the soil profile.

Evaluation and Results

The profile response with depth and the response spectra at the modeled ground surface were obtained from the site response analysis for each of the selected ground motions as shown on Figures F-11 through F-19 and the averages of the non-linear and equivalent linear responses are provided on Figure F-20. In general, the equivalent linear site response analysis resulted in deamplification of the “outcrop” ground motions at the surface at short periods (generally less than periods of approximately 0.4s to 0.6s) and amplification at the surface at longer periods. The

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non-linear site response analysis also resulted in deamplification at shorter periods with amplification of the “outcrop” ground motions at the ground surface at periods greater than about 0.7s to 0.9s. When comparing the average equivalent linear and non-linear results of the selected ground motions to the target spectrum, deamplification was observed at periods up to approximately 0.4s and 0.9s, respectively, with amplification at periods thereafter (up to 5 seconds for the site response analysis).

The maximum spectral acceleration values of the non-linear and equivalent linear site response results were used to develop an enveloping spectrum in order to evaluate the amplification of the target spectrum expected at the site. As shown on Figure F-21, the average equivalent linear spectrum controls for periods up to approximately 2 seconds and the average non-linear spectrum controls thereafter. This enveloping spectrum was compared to the average of the “outcrop” ground motions to develop amplification factors (i.e. ratio of enveloping spectral accelerations to “outcrop” spectral accelerations). The amplification factors are also provided on Figure F-21.

Using the amplification factors shown in Figure F-21, the recommended design acceleration response spectrum was developed by multiplying the base target spectrum by the amplification factors at each period consistent with the requirements of AASHTO LRFD BDS. This amplified spectrum was then compared with two-thirds of the general procedure spectrum developed in accordance with AASHTO LRFD BDS as the final recommended design response spectrum should not be less than the two-thirds of the general procedure spectrum. The general procedure response spectrum was developed using the values of peak ground acceleration (PGA), the short-period spectral acceleration coefficient (S_s), and the long-period spectral acceleration coefficient (S_1) obtained from the USGS National Seismic Hazard Maps for a 975-year return period as presented in Section 3.10.2.1 of the AASHTO LRFD BDS. These spectral accelerations were site corrected using the Site Class D site factors referenced from Section 3.10.3.2 of the AASHTO LRFD BDS and the site-corrected spectral accelerations were used to develop the general procedure spectrum is accordance with Section 3.10.4.1 of the AASHTO LRFD BDS.

As shown on Figure F-22, the amplified target spectrum controls for all periods in our analysis except for periods between approximately 0.03 and 0.3 seconds in which the two-thirds of the general procedure spectrum controls. Therefore, the final recommended design acceleration response spectrum is an enveloping spectrum of the amplified target spectrum and the two-thirds of the general procedure spectrum. This recommended design acceleration response spectrum and the associated spectral displacement values are provided in Table F-5 and shown on Figure F-23.

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Table F-5
Site-Specific Horizontal 5% Damped
Recommended Design Spectral Acceleration and
Spectral Displacement Values

Period, T (seconds)	Design Acceleration Spectrum, S_a (g)	Design Displacement Spectrum, S_D (in)
0.010	0.379	0.00
0.020	0.394	0.00
0.030	0.409	0.00
0.050	0.482	0.01
0.075	0.574	0.03
0.1	0.665	0.07
0.113	0.714	0.09
0.2	0.714	0.28
0.28	0.714	0.55
0.3	0.766	0.67
0.5	0.964	2.36
0.75	0.888	4.89
1.0	0.957	9.37
2.0	0.502	19.67
3.0	0.282	24.85
4.0	0.172	26.99
5.0	0.118	28.86

LIMITATIONS

The values in this appendix were developed using site response analysis as required by Caltrans SDC V2.0 and supersede any seismic design parameters provided previously. The results are subject to the limitations in Section 7 of this Preliminary Geotechnical Design Report and rely upon the results of the field investigation as presented in this report.

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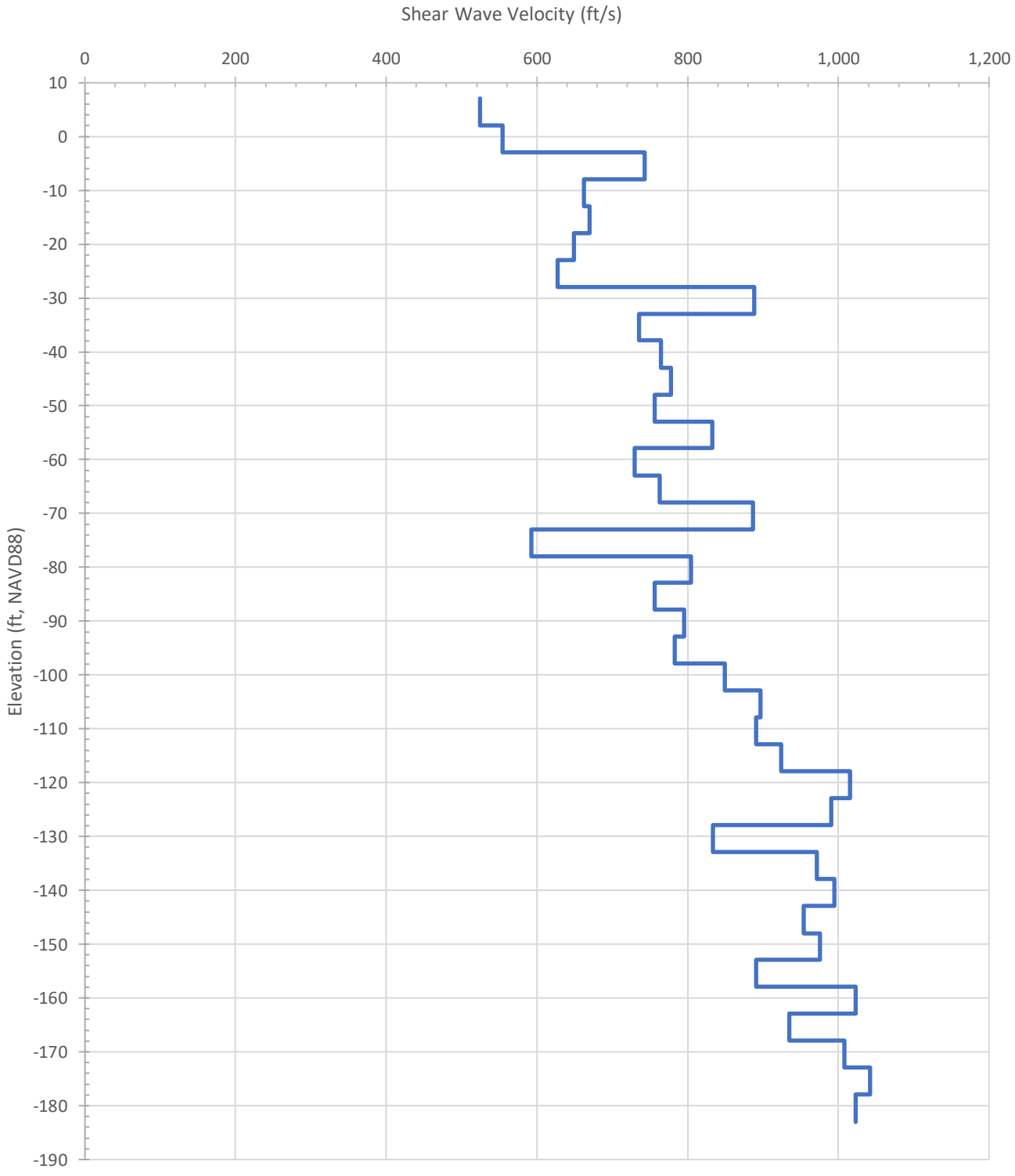
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SCPT Shear Wave Velocity Results



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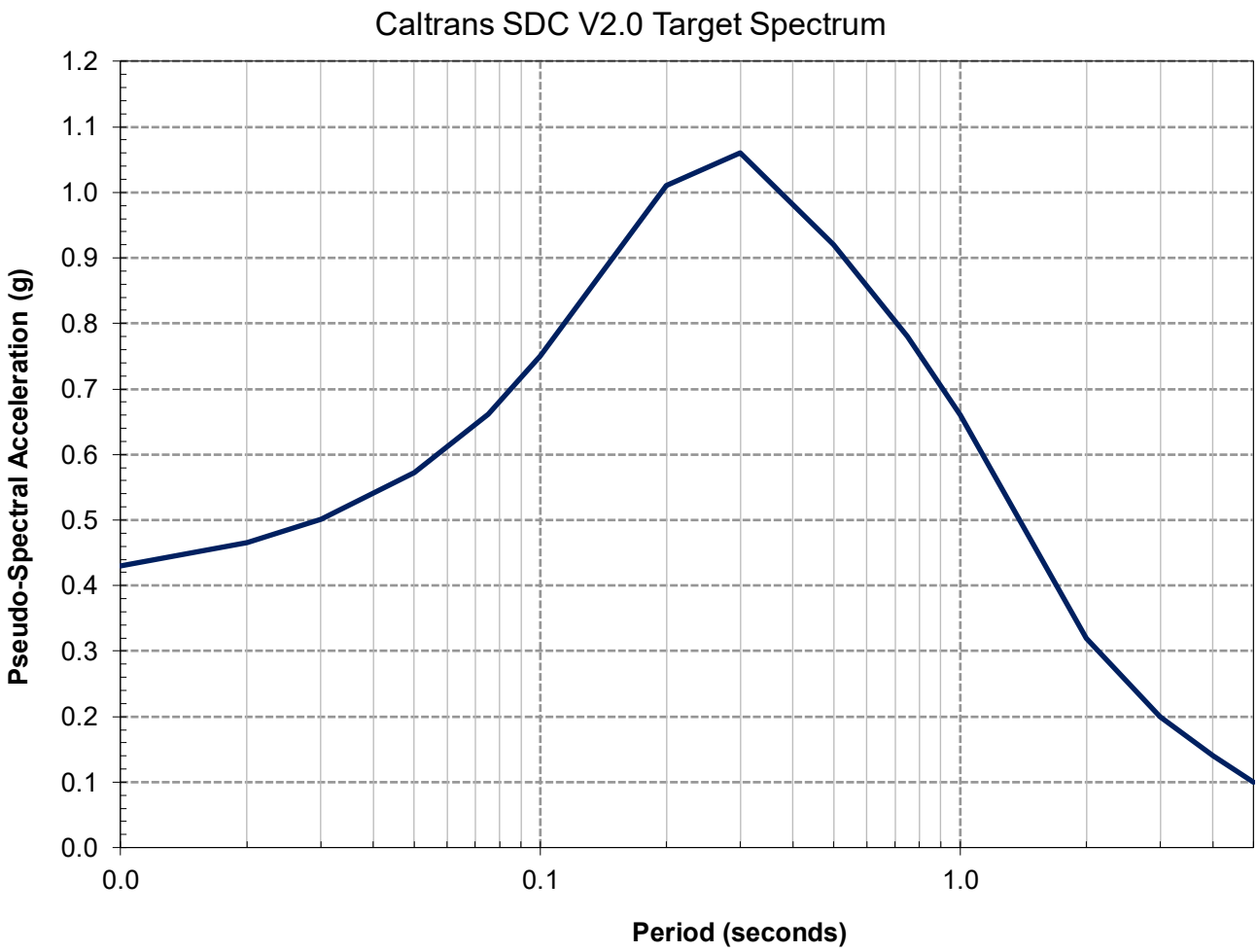
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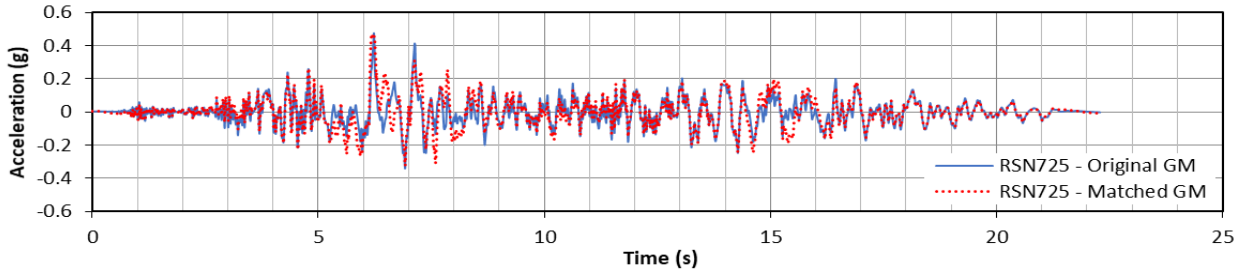
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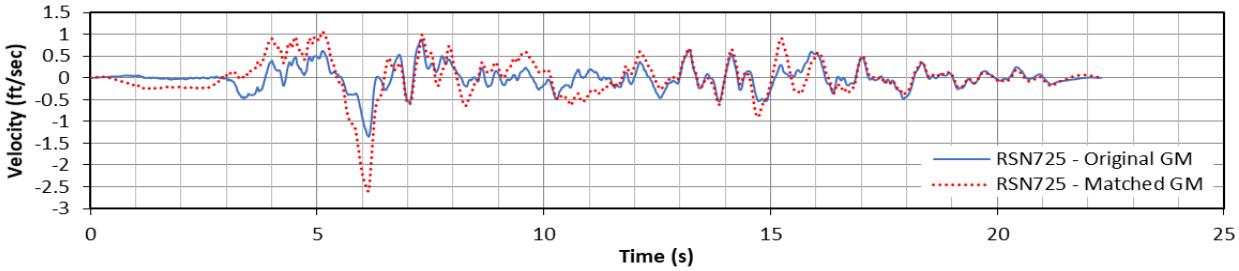
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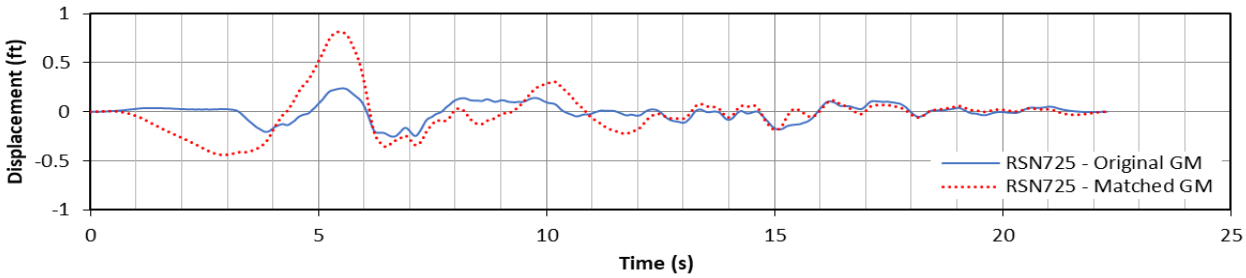
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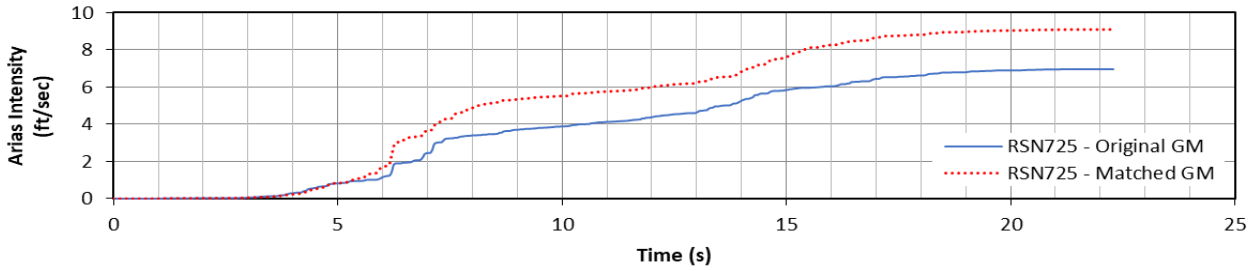


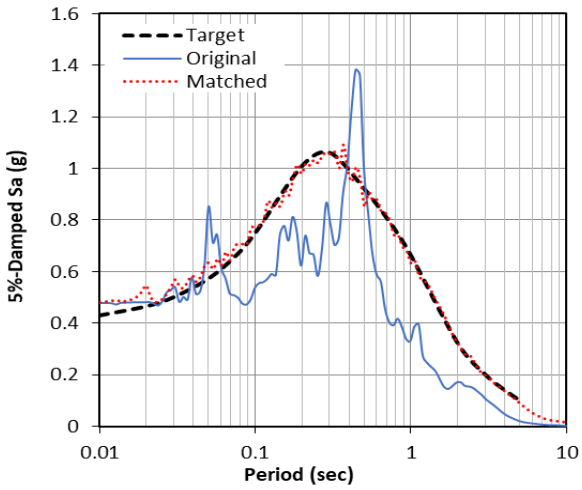
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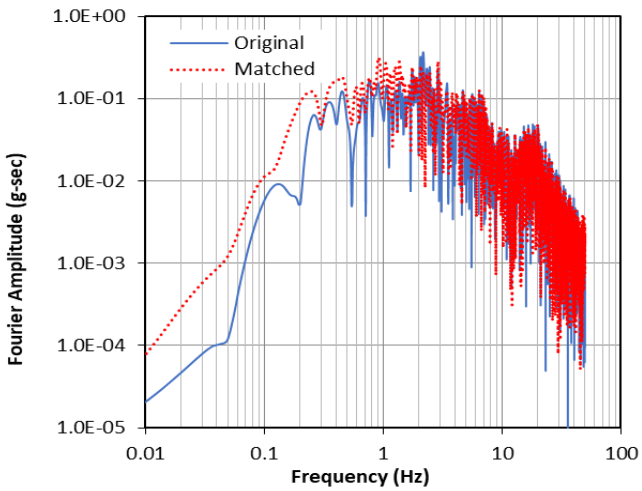












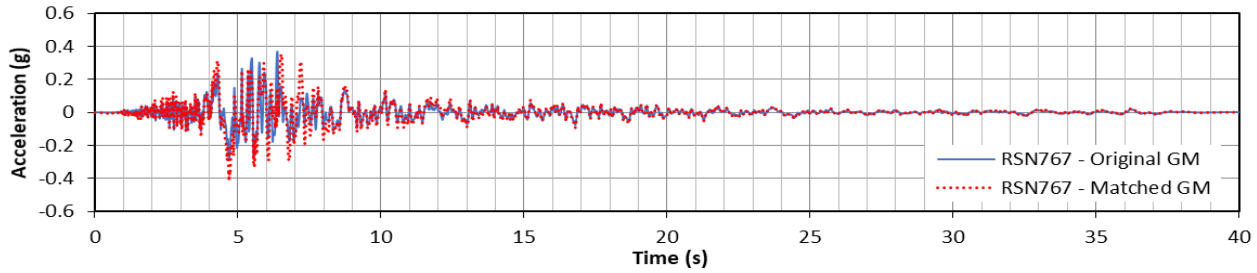
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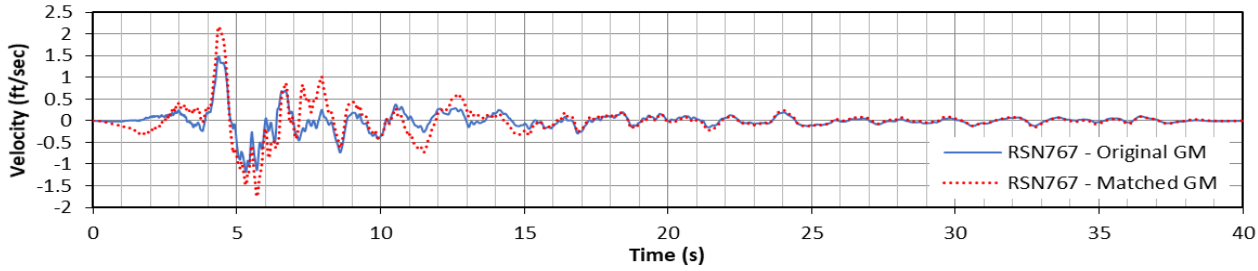
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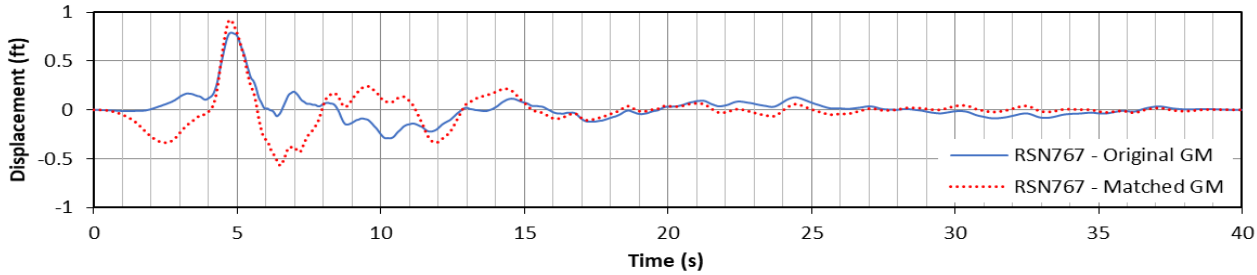
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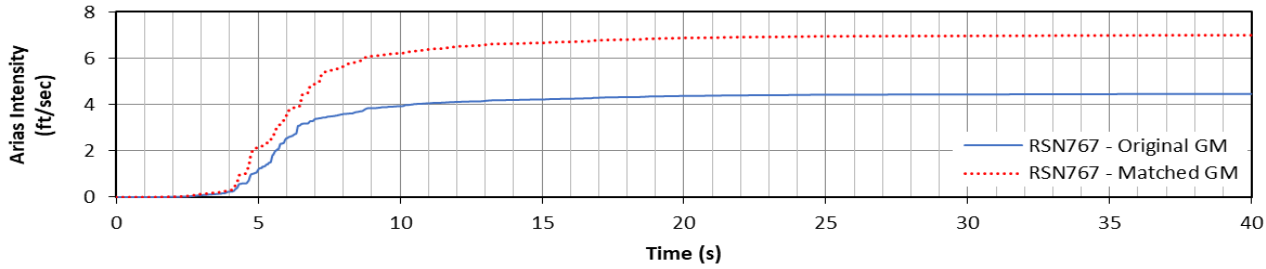
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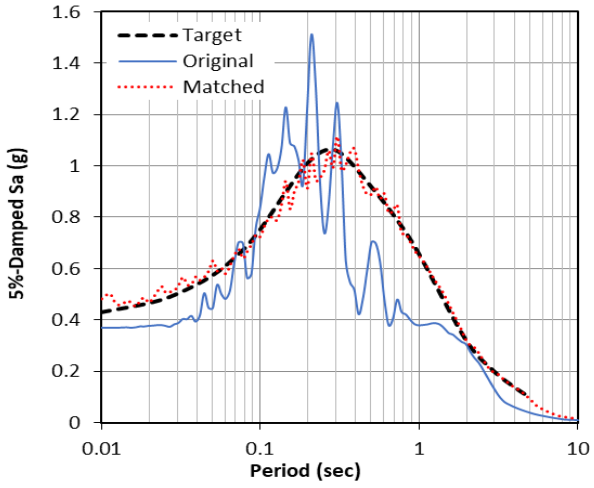
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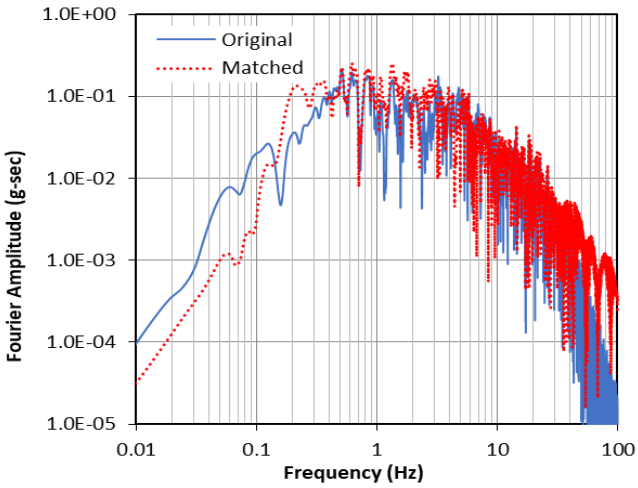












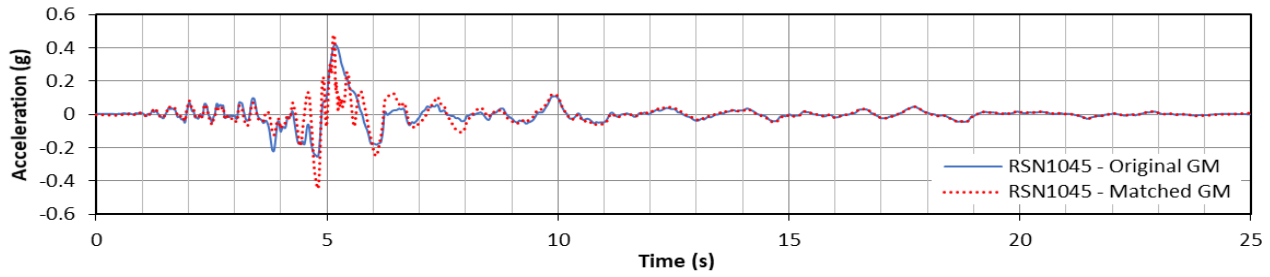
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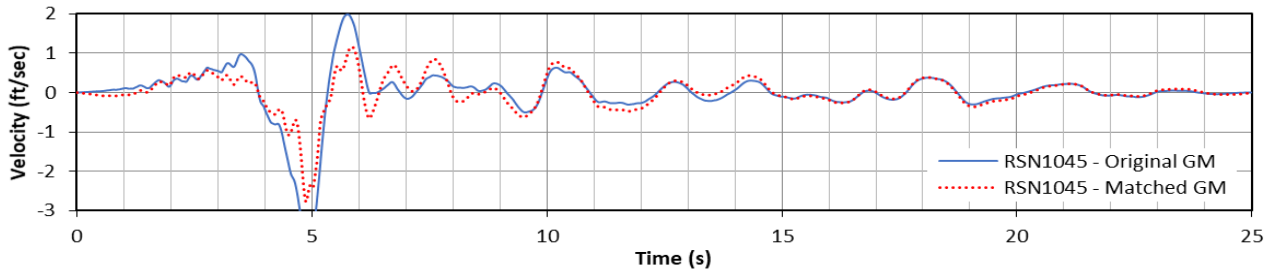
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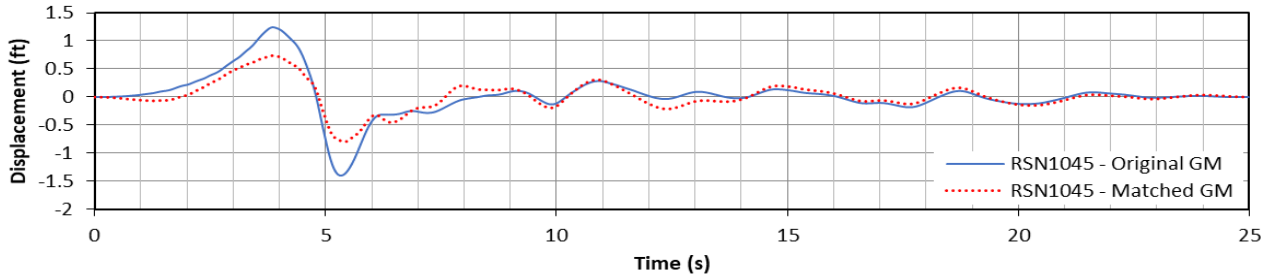
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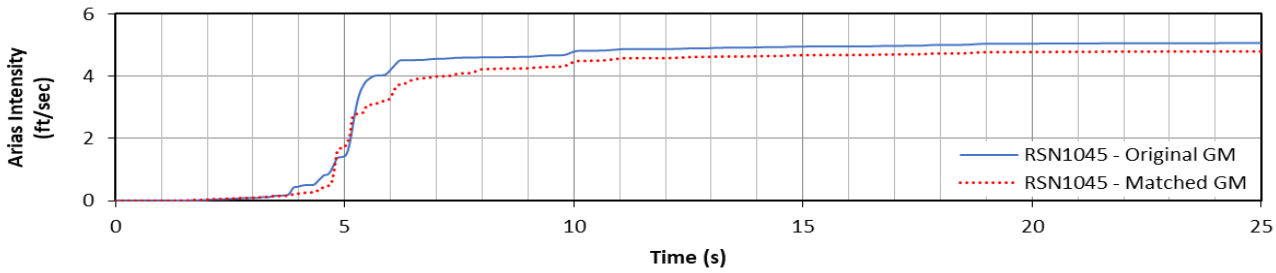
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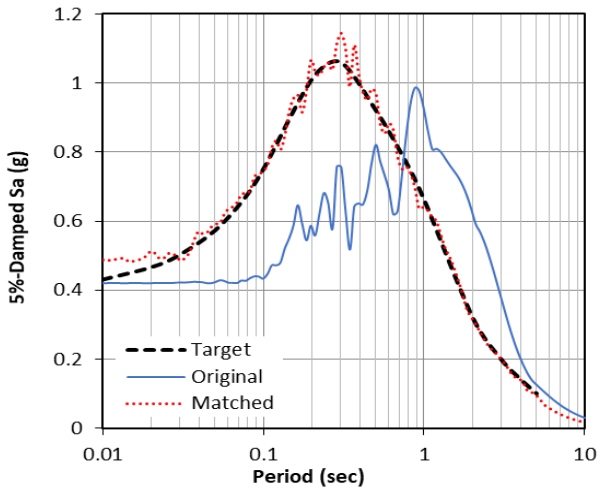
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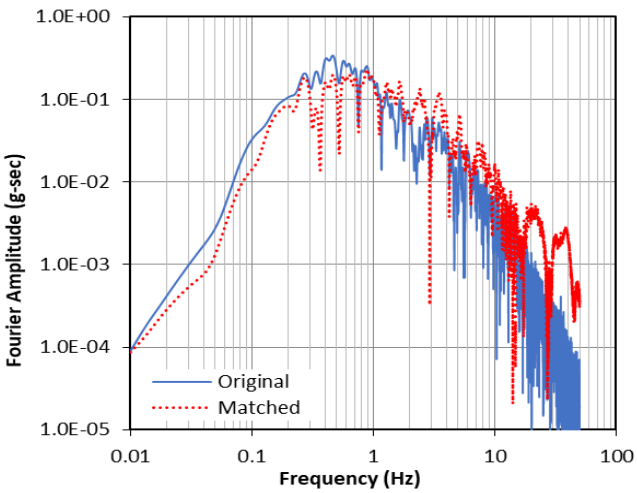












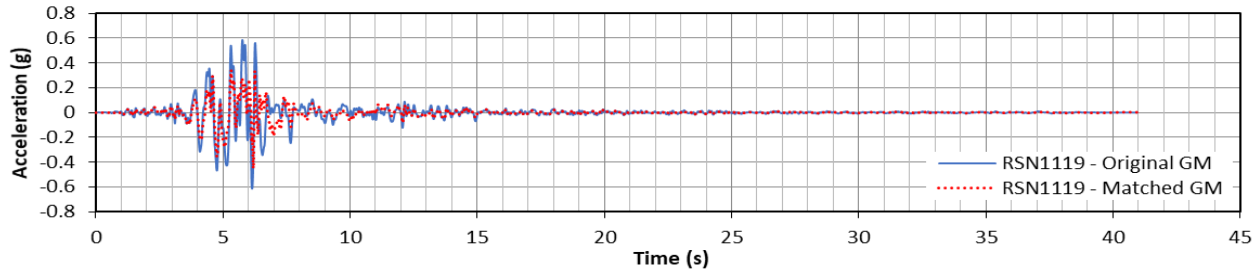
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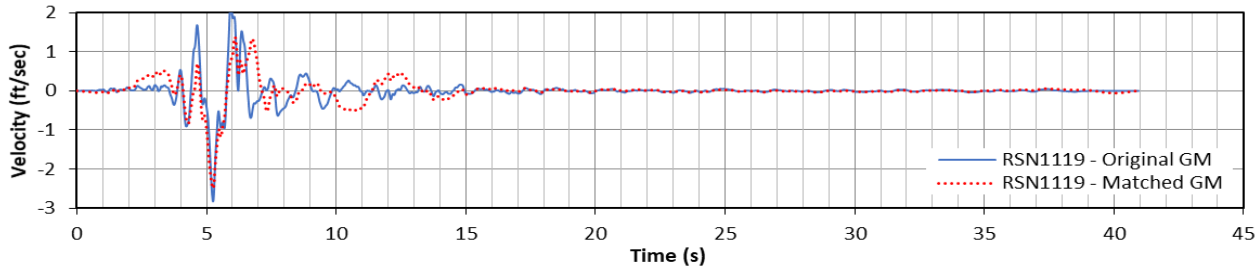
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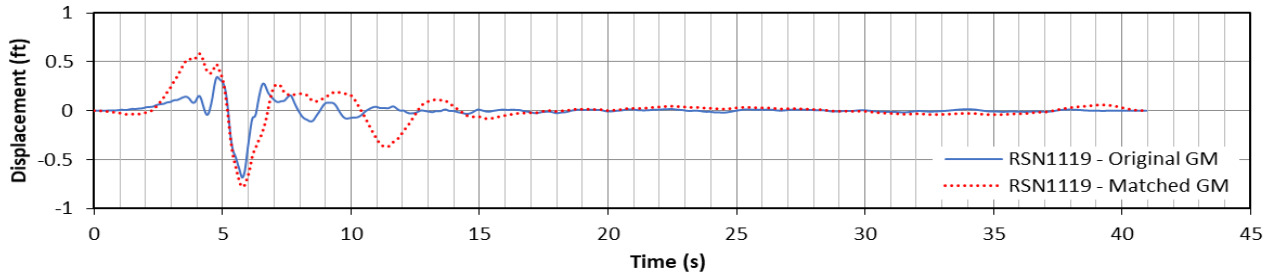
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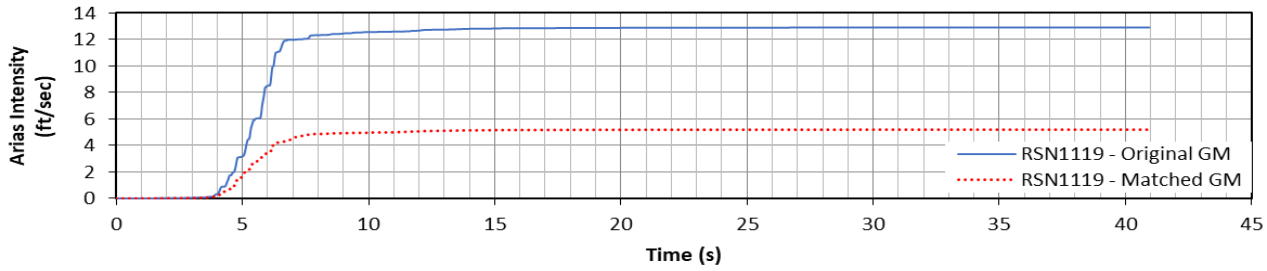
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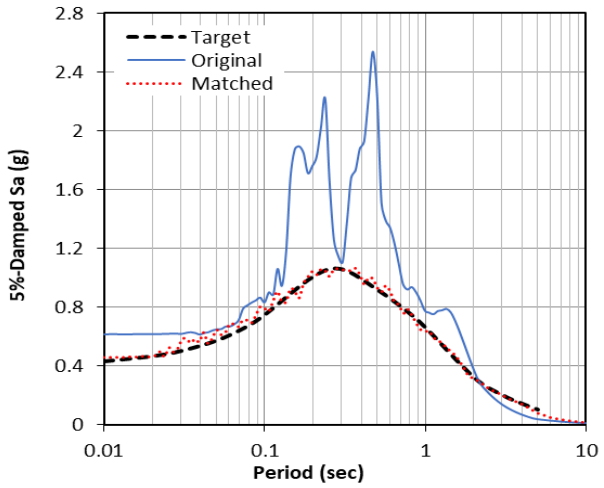
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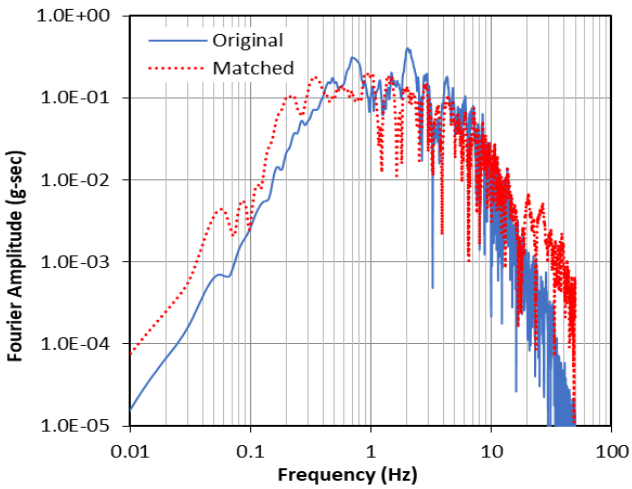












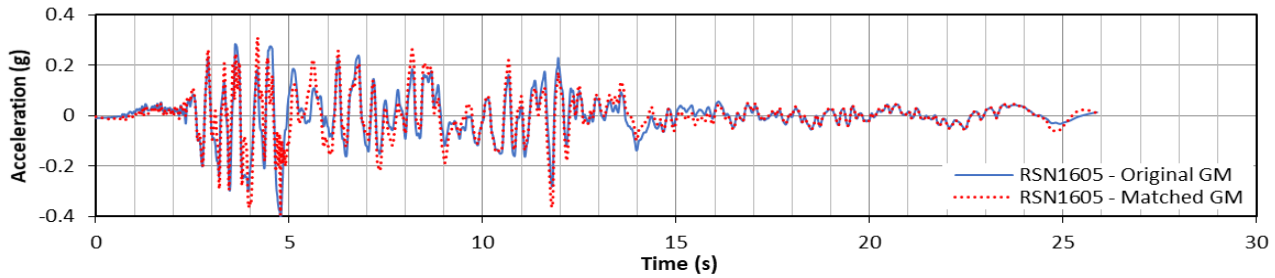
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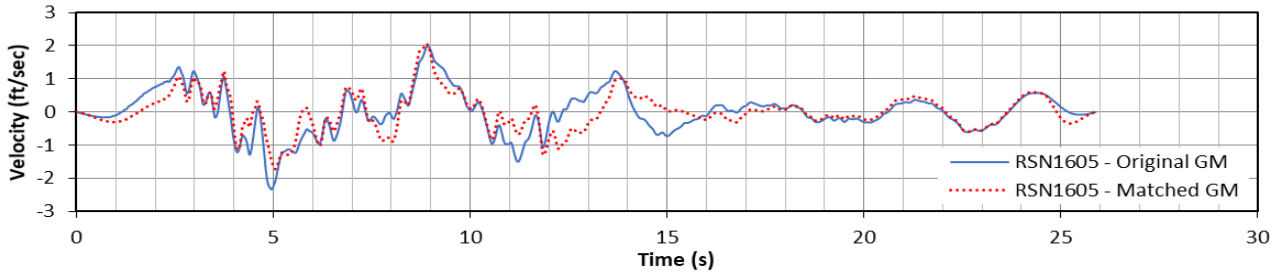
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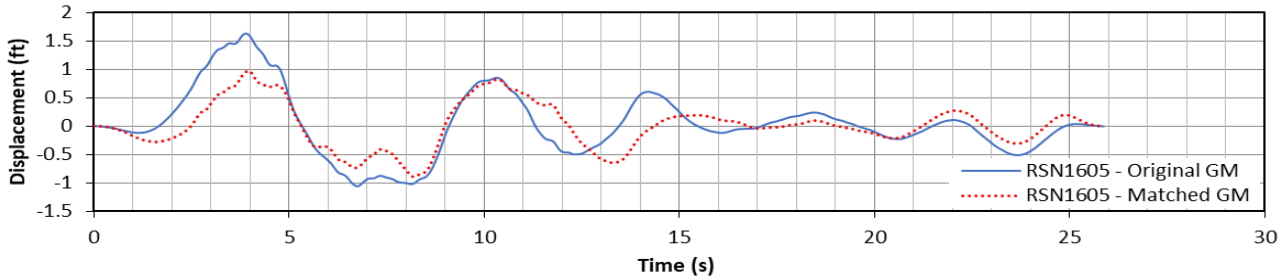
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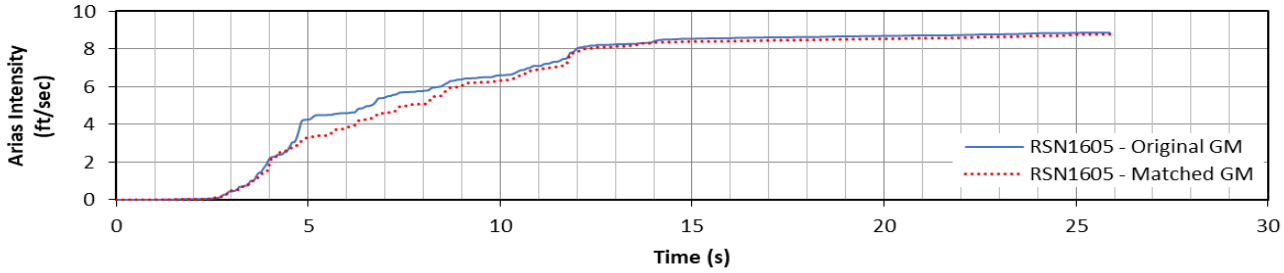
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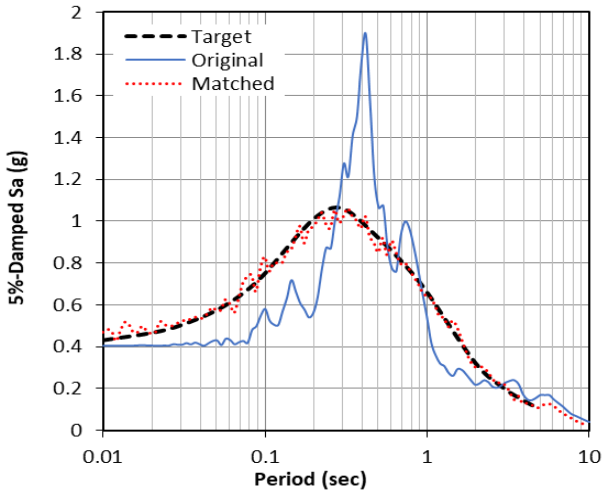
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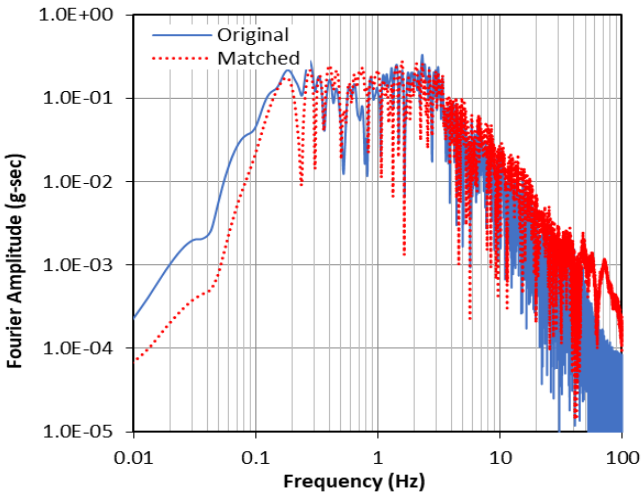












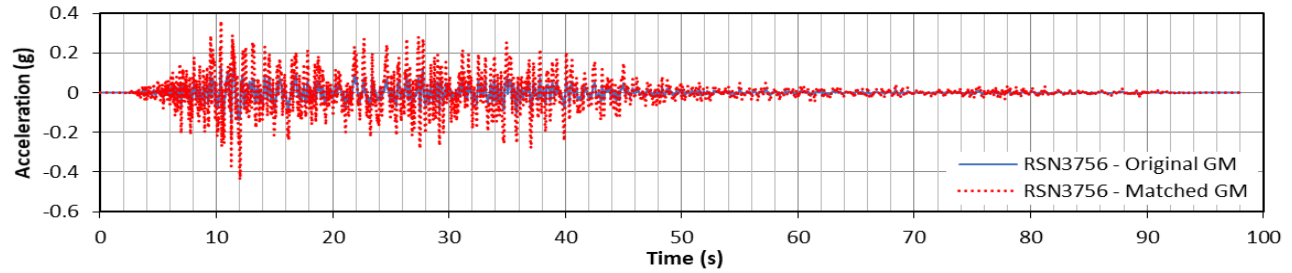
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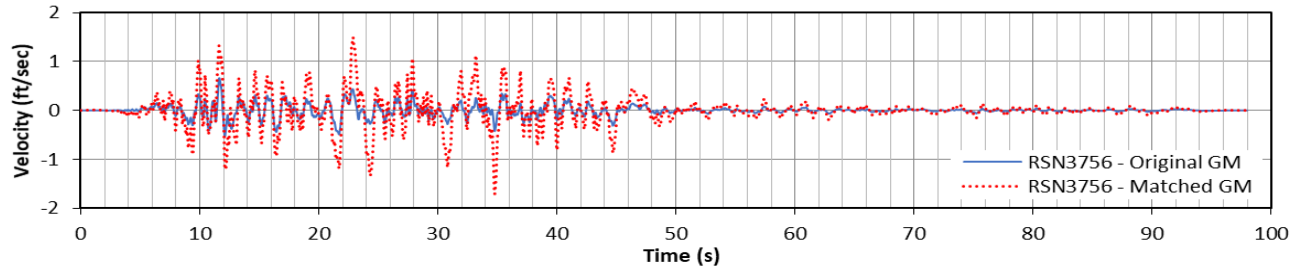
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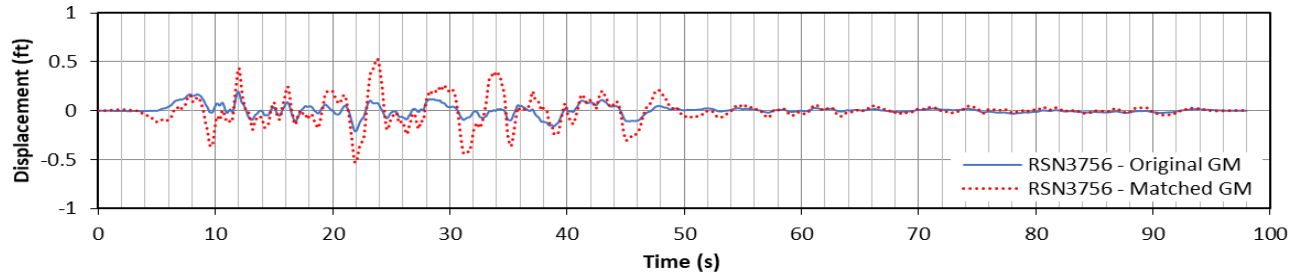
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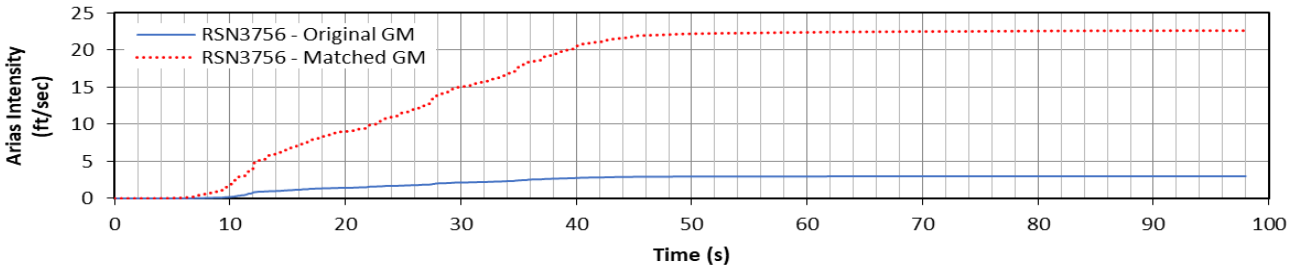
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OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

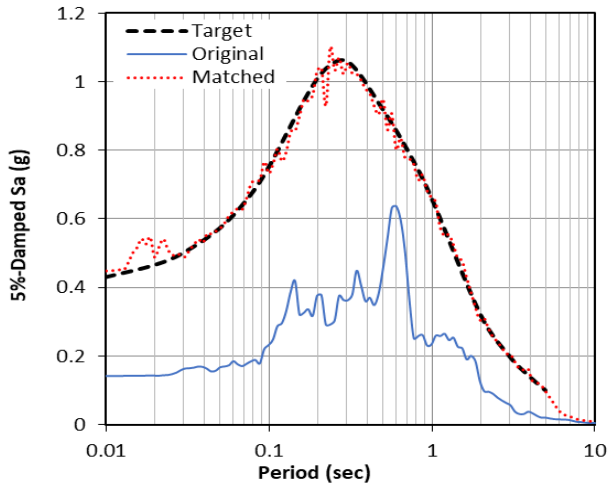
FIGURE
F-7

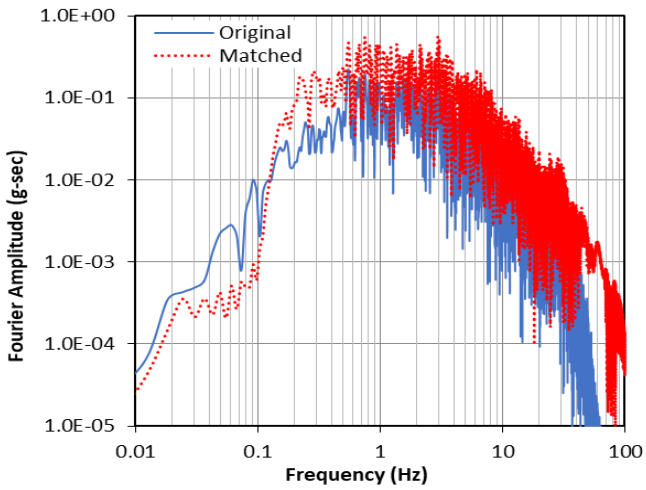












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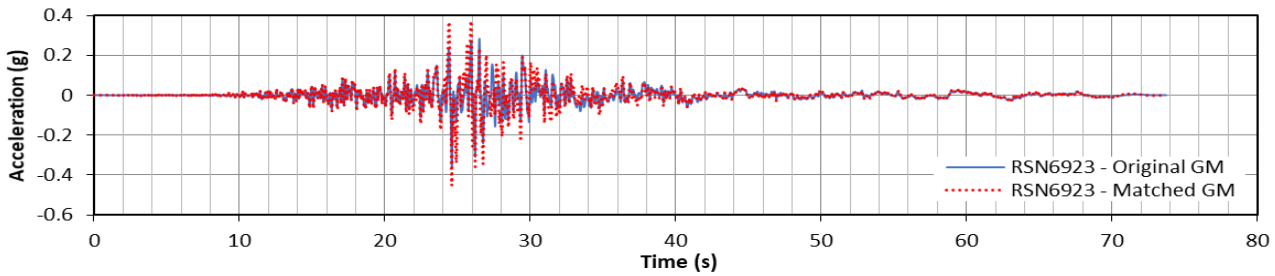
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM6 Plots.ppt

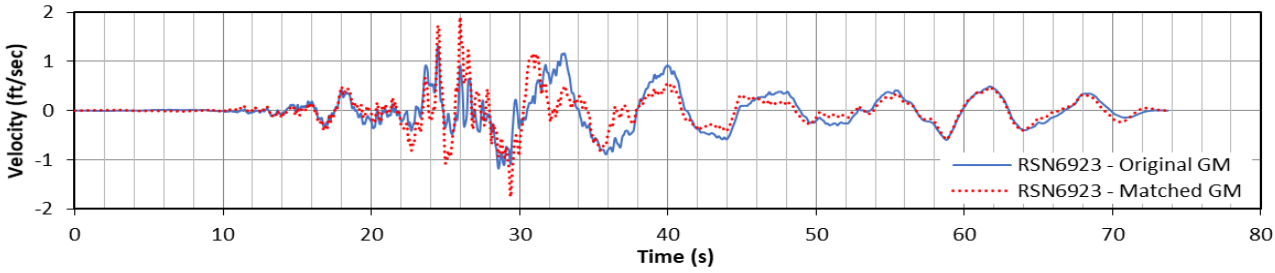
SPECTRAL MATCHING RESULTS
RSN No. 3756 (90°)
LANDERS 1992

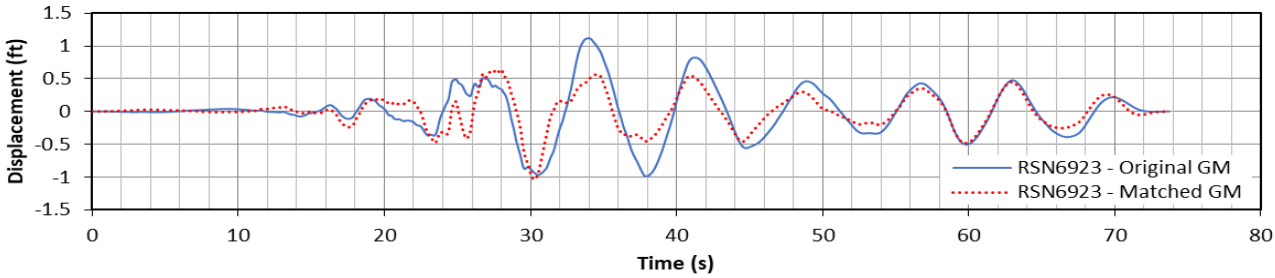
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

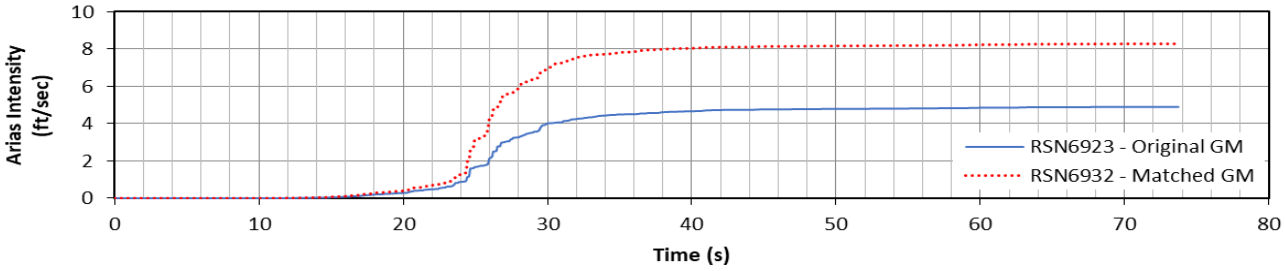
FIGURE

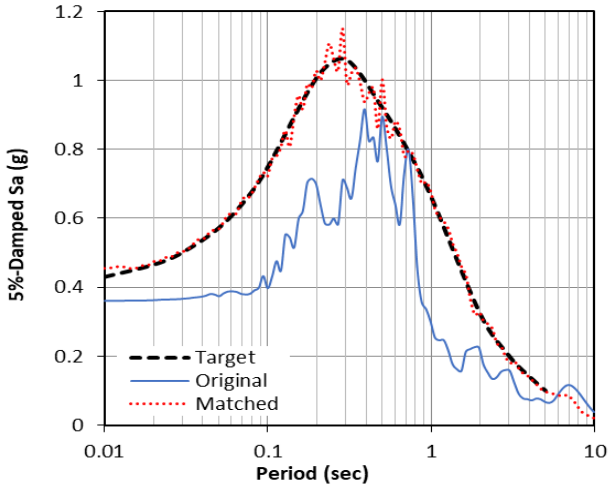
F-8

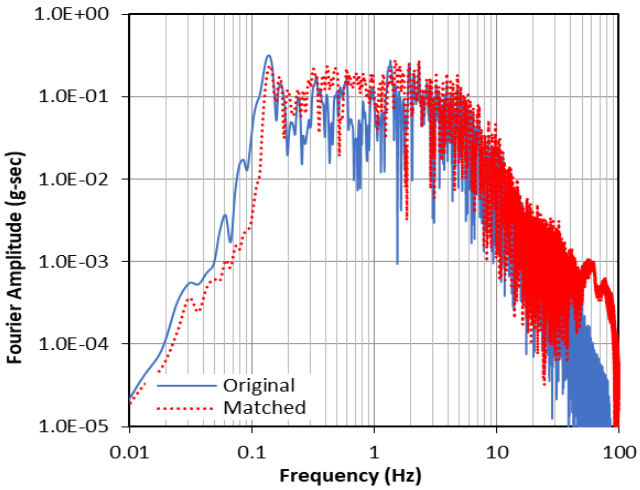












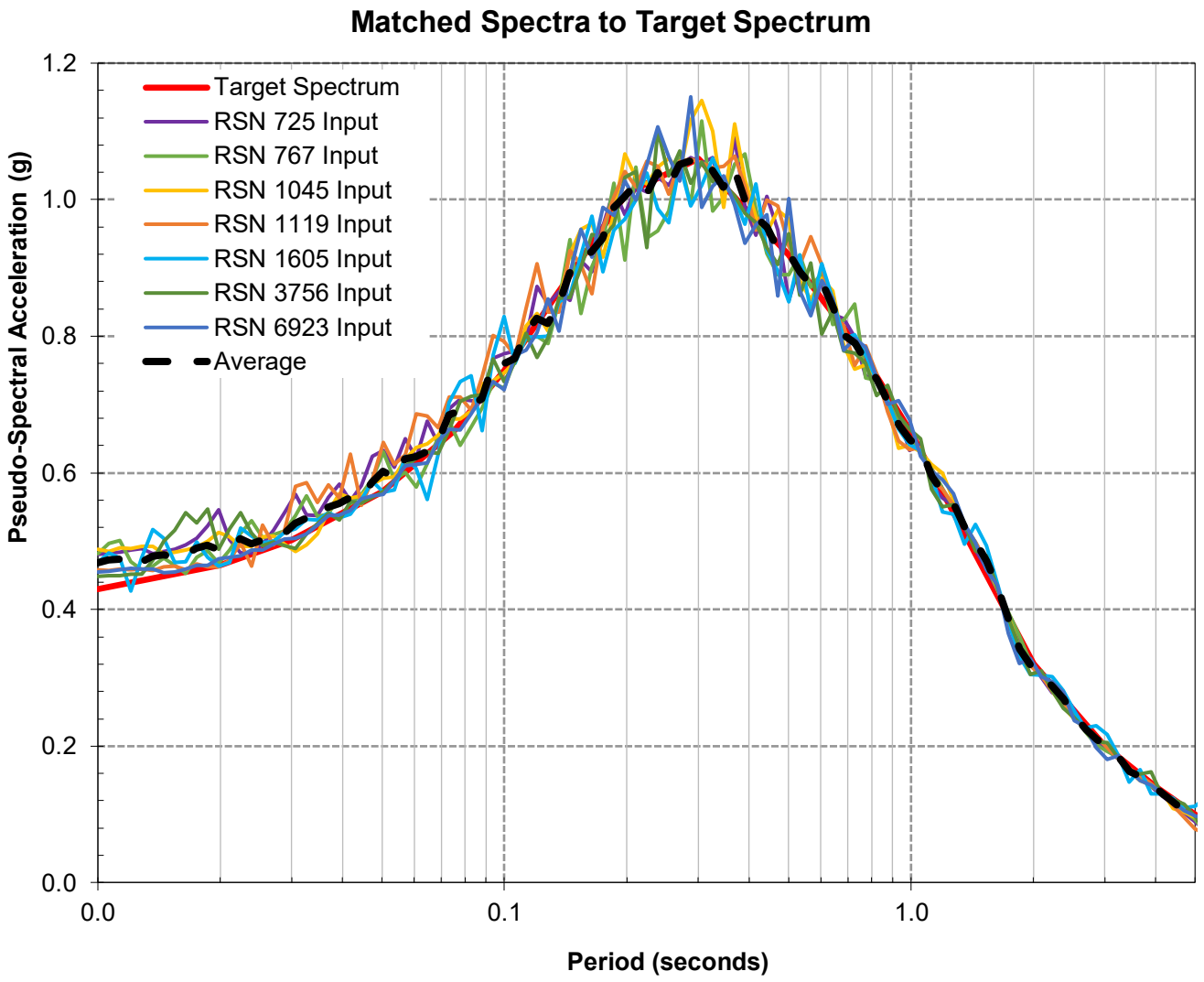
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PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM7 Plots.ppt

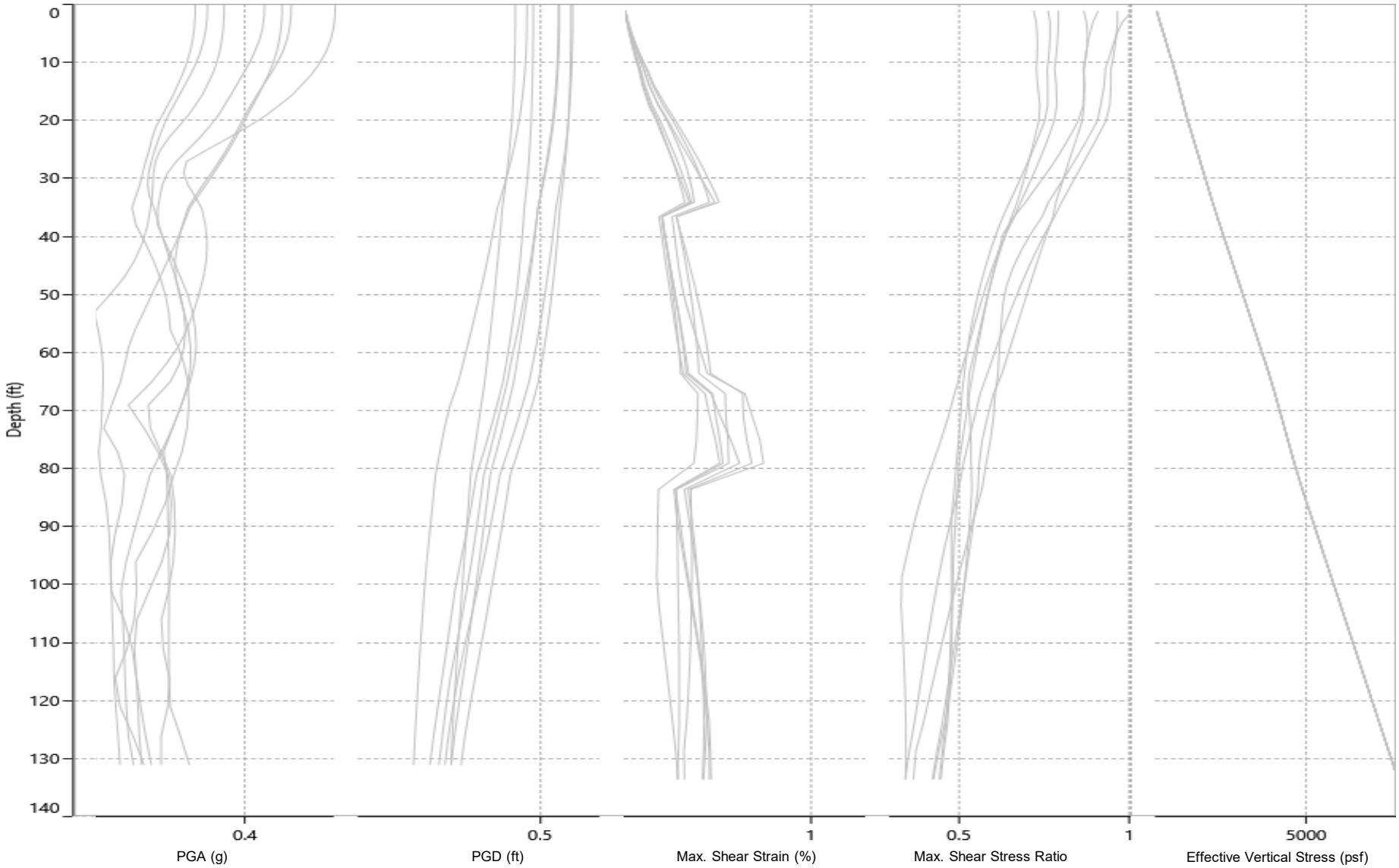
SPECTRAL MATCHING RESULTS
RSN No. 6923 (N15E)
DARFIELD, NEW ZEALAND 2010

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
F-9



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	DATE: 06/2020		
	DRAWN: JLB		
	CHECKED BY: ZZ	CAMINO DEL MAR BRIDGE REPLACEMENT OVER SAN DIEGUITO RIVER - PHASE 0 DEL MAR, CALIFORNIA	
	File Name: InputSpectra.ppt		



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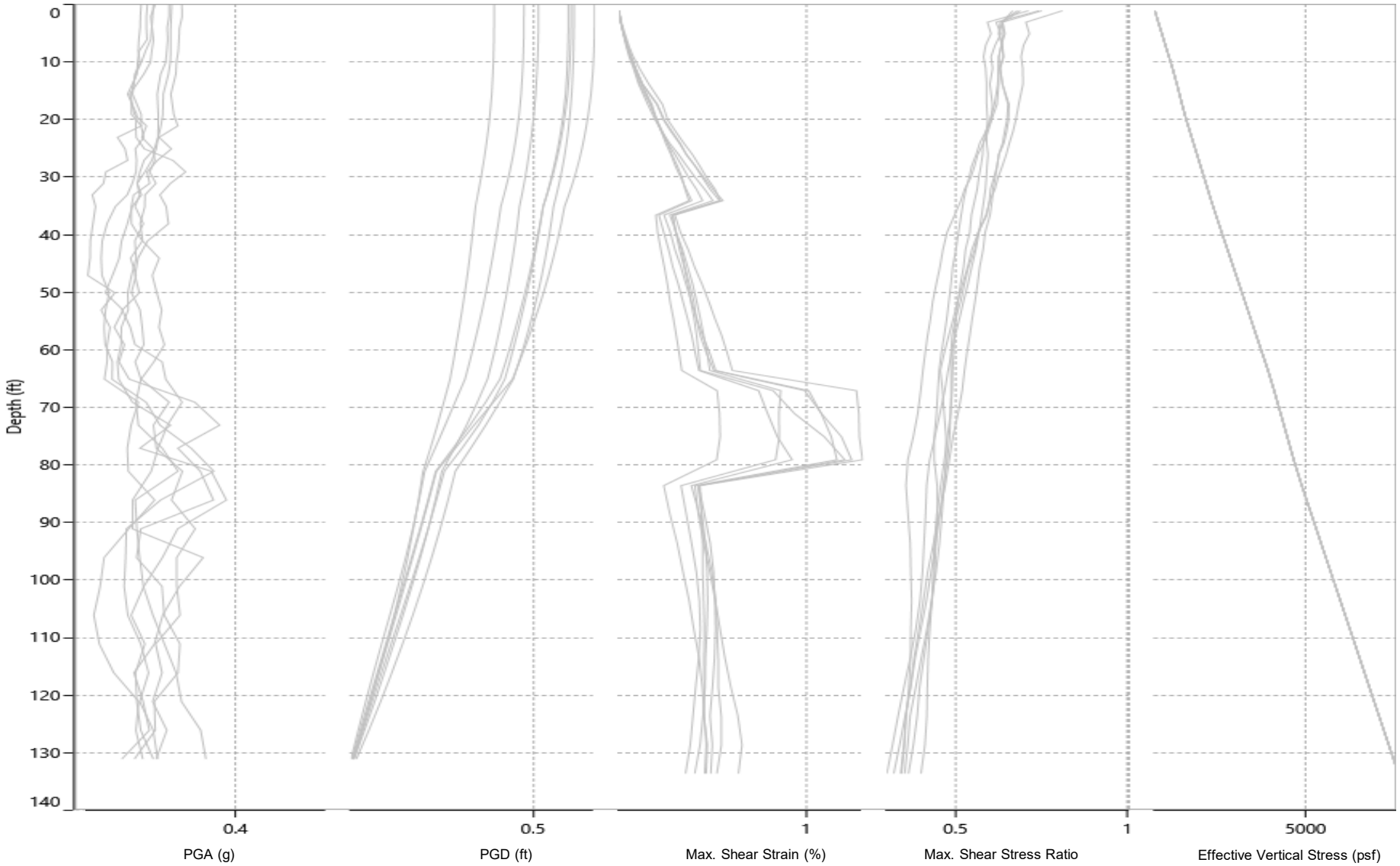
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	Results Prof Plots.ppt

EQUIVALENT LINEAR SITE RESPONSE RESULTS VS DEPTH GM1 TO GM7

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER – PHASE 0
DEL MAR, CALIFORNIA

FIGURE

F-11



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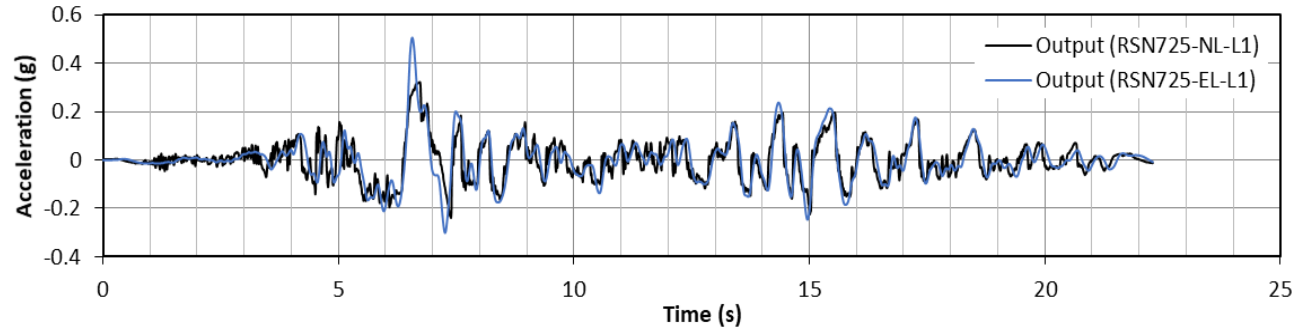
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	Results Prof Plots.ppt

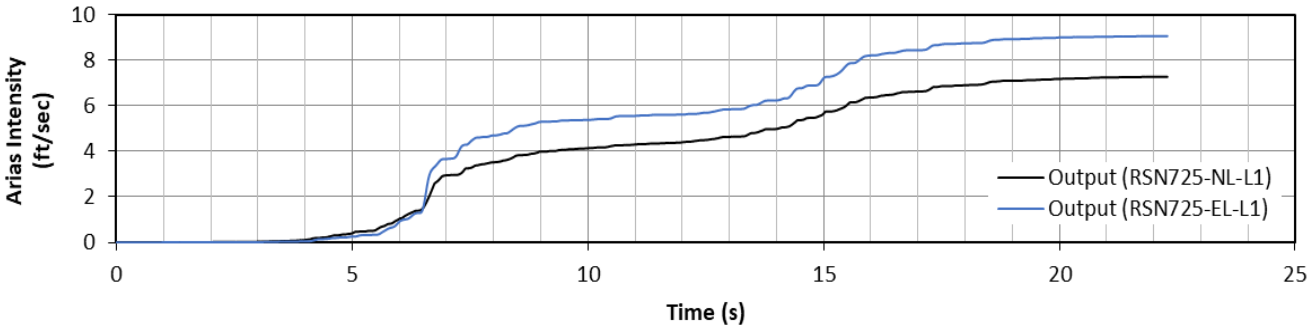
NON-LINEAR SITE RESPONSE RESULTS VS DEPTH GM1 TO GM7

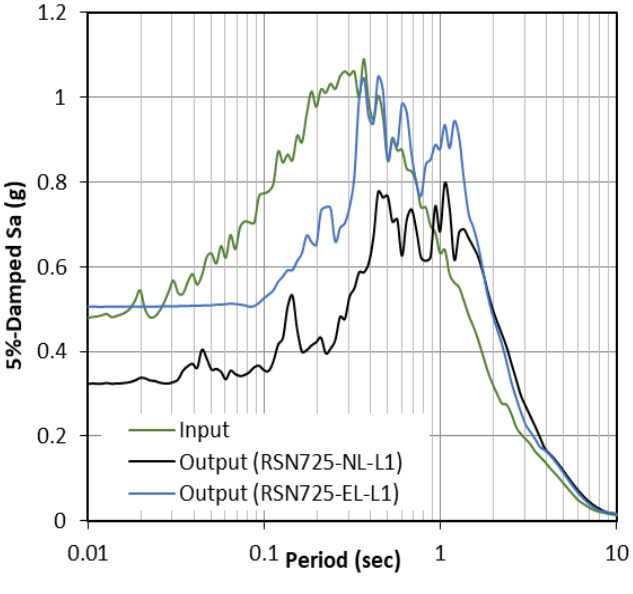
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER – PHASE 0
DEL MAR, CALIFORNIA

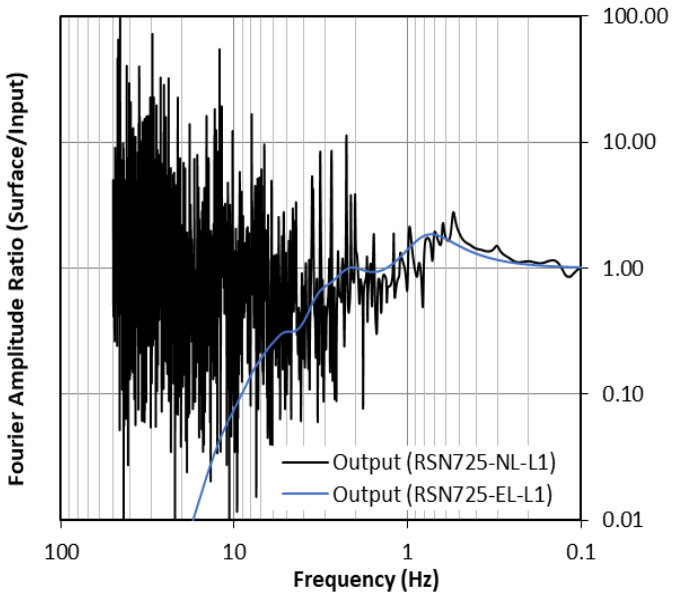
FIGURE

F-12



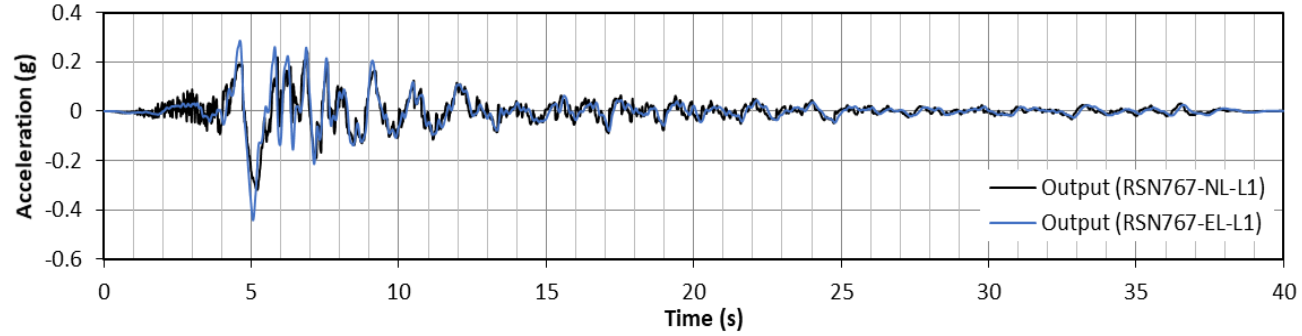


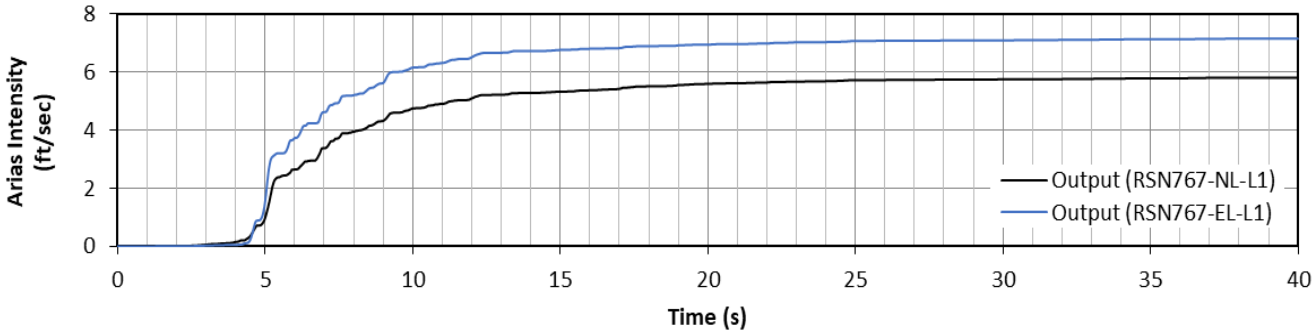


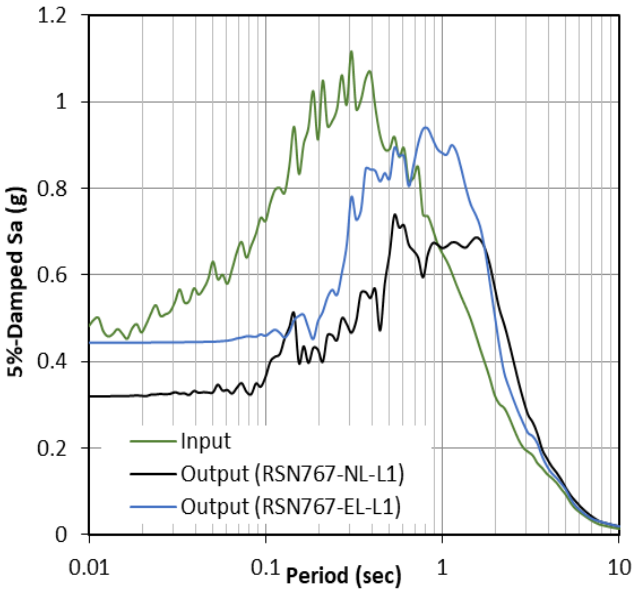


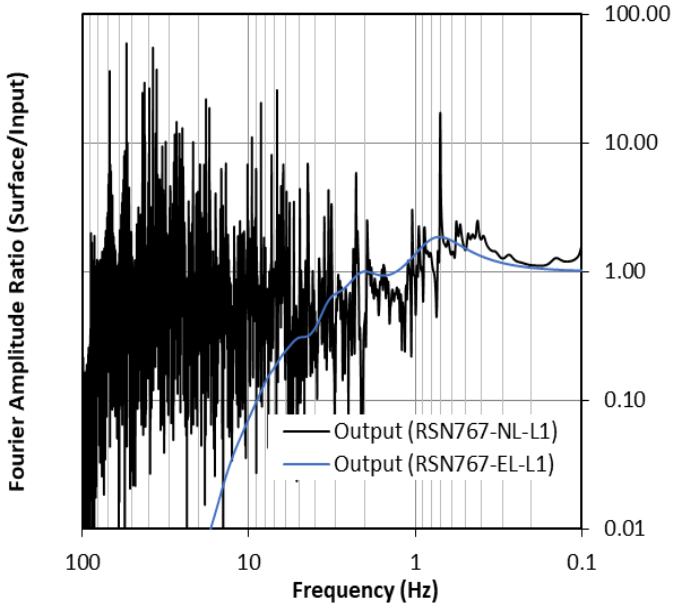
Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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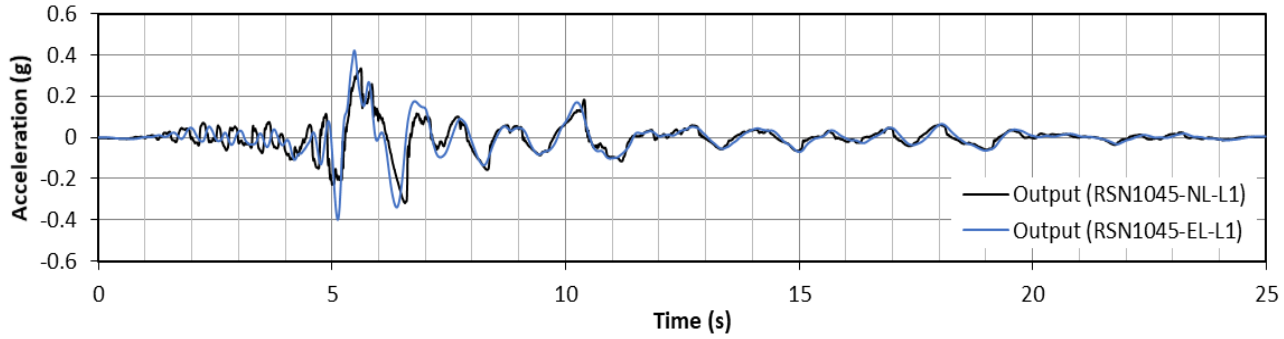


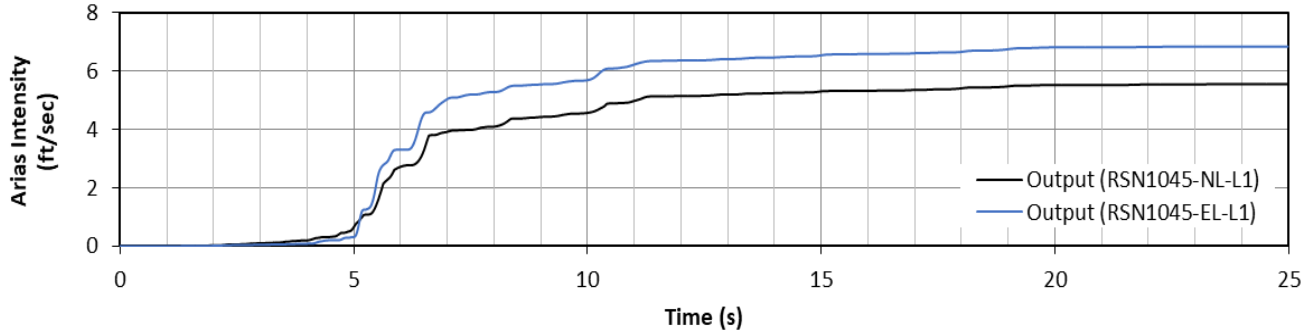


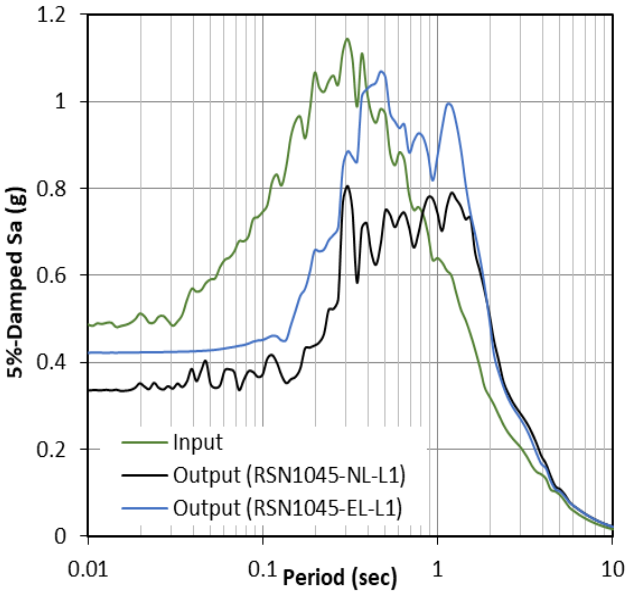


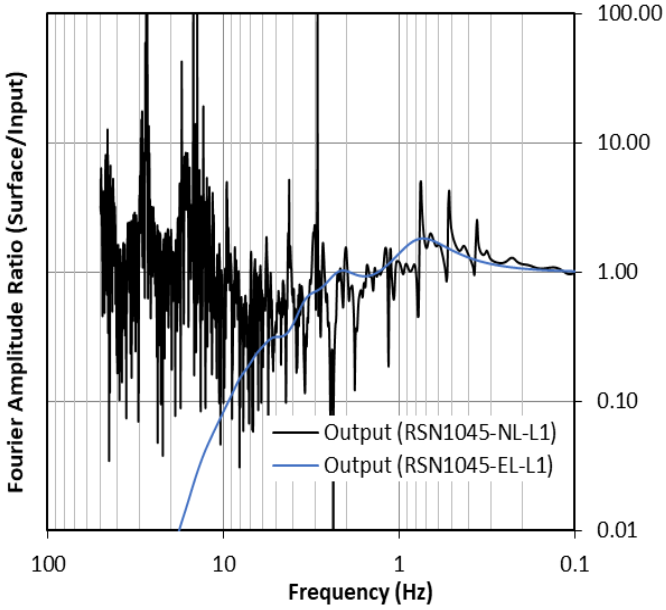
Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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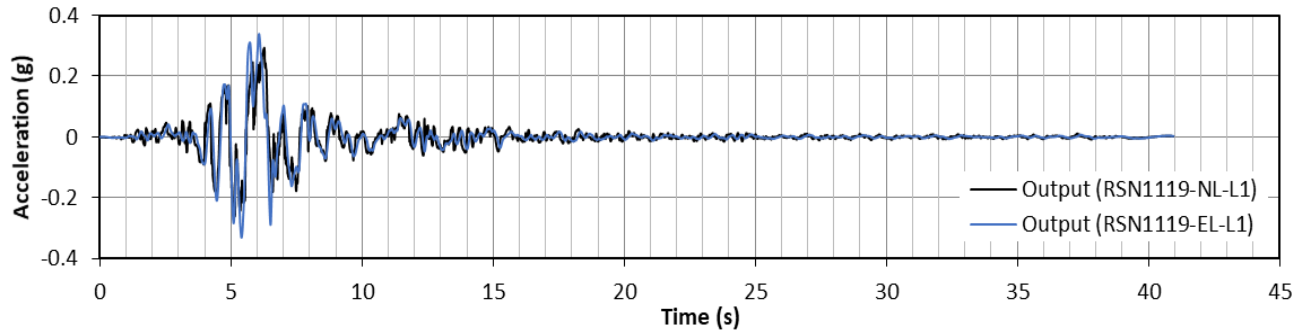


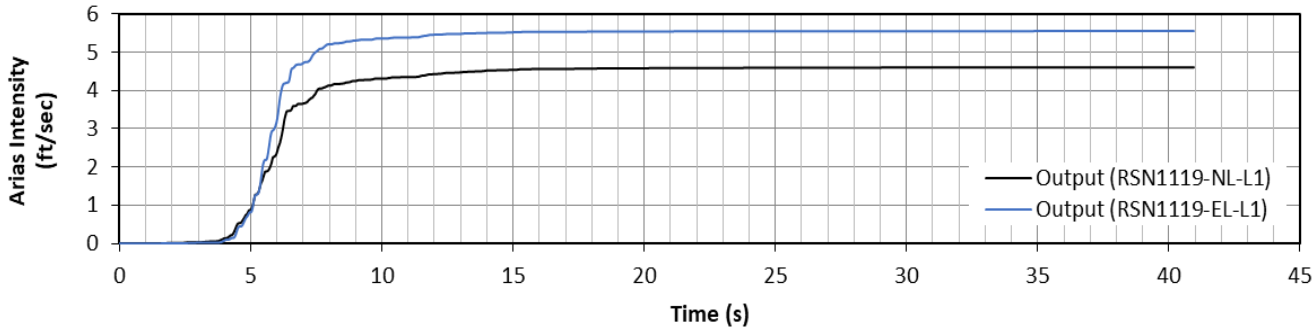


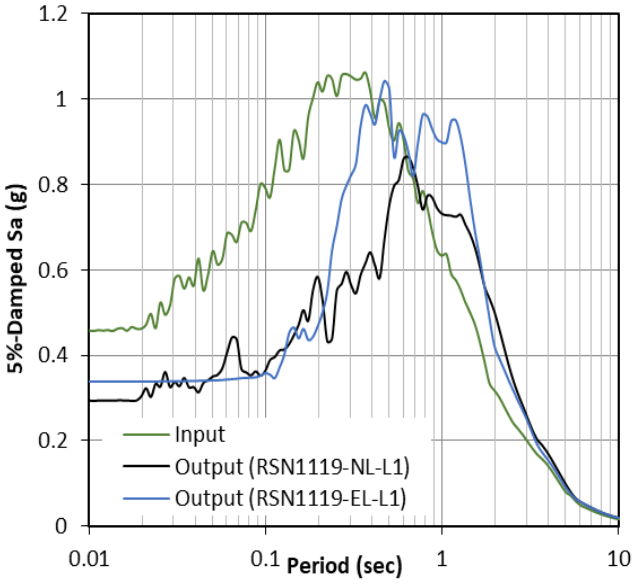


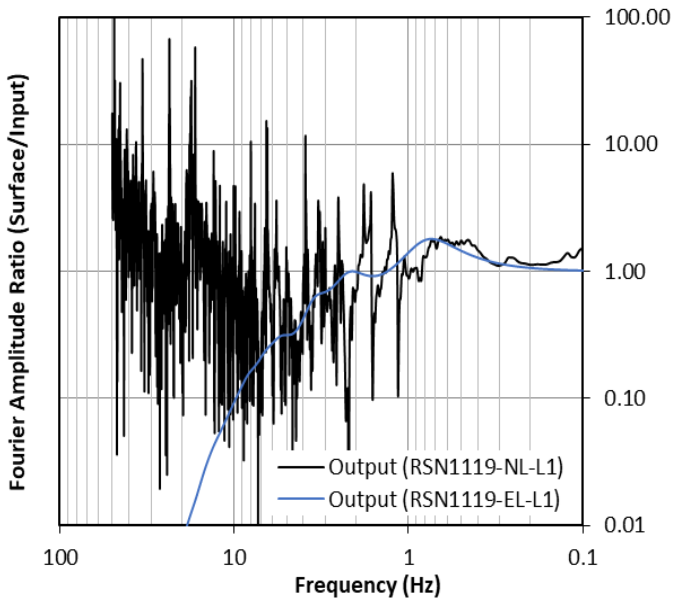
Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com	PROJECT NO. 20180876.001A	**GROUND MOTION RSN1045 RESPONSE AT GROUND SURFACE**	FIGURE **F-15**
	DATE: 06/2020		
	DRAWN: JLB		
	CHECKED BY: ZZ	CAMINO DEL MAR BRIDGE REPLACEMENT OVER SAN DIEGUITO RIVER - PHASE 0 DEL MAR, CALIFORNIA	
	File Name: GM3 Response.ppt		



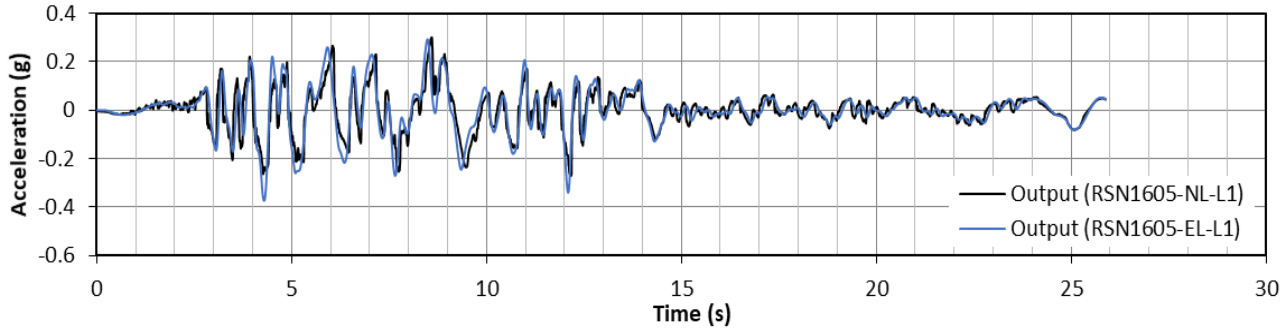


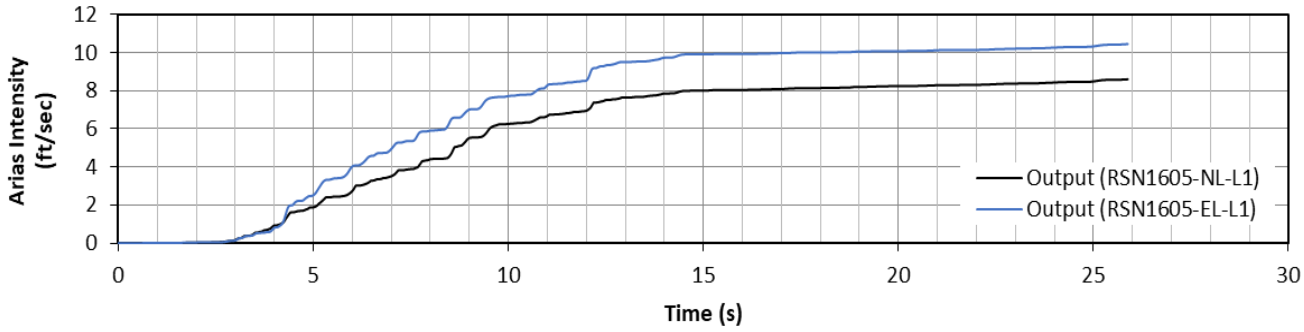


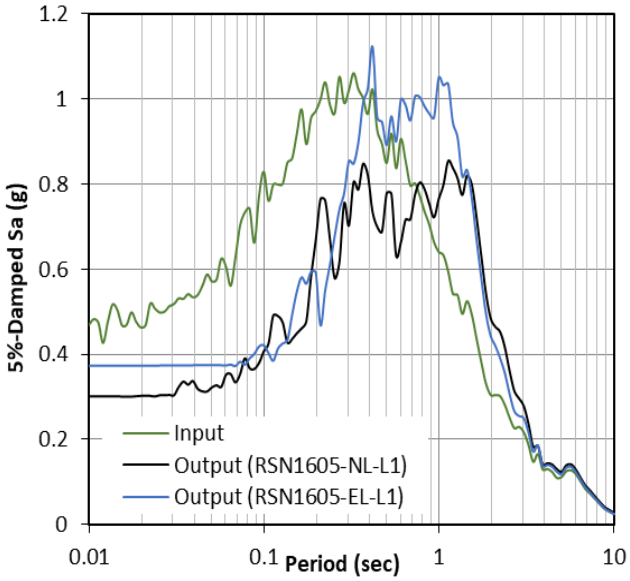


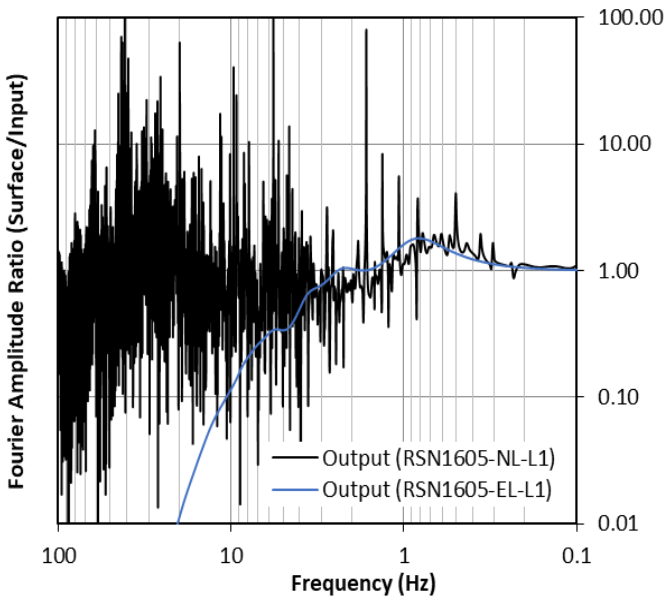
Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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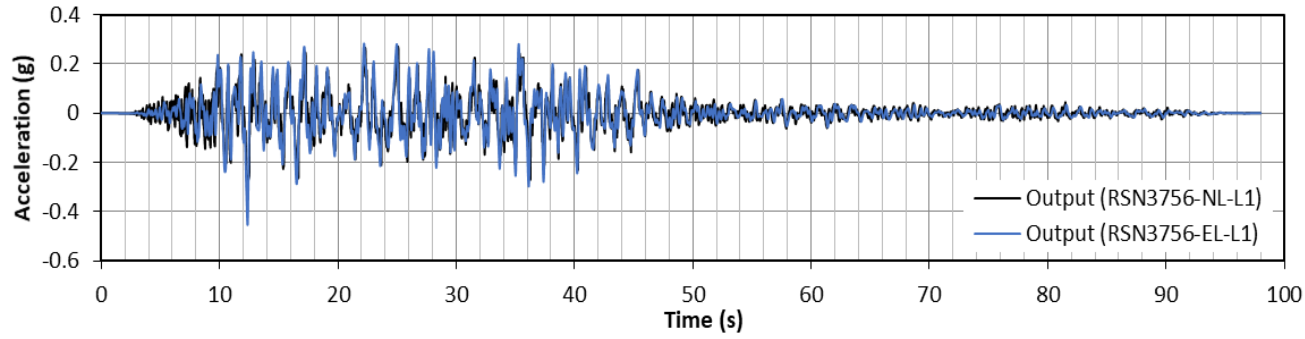
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM5 Response.ppt

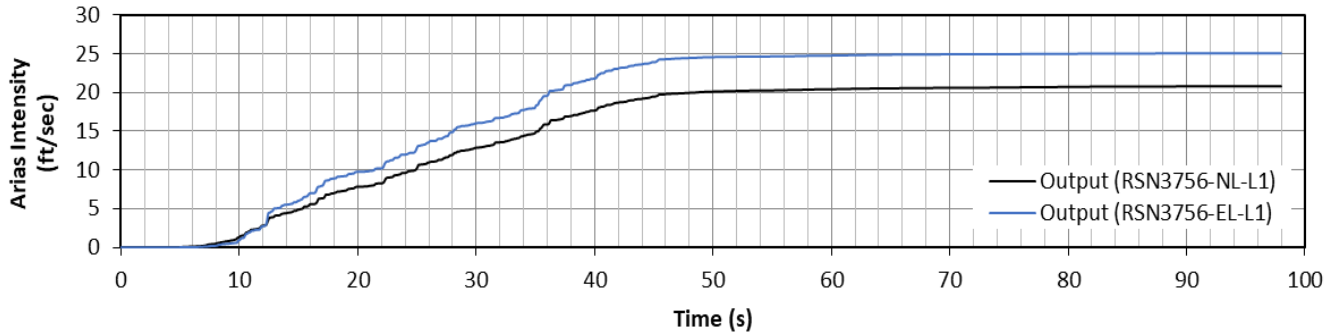
GROUND MOTION RSN1605 RESPONSE AT GROUND SURFACE

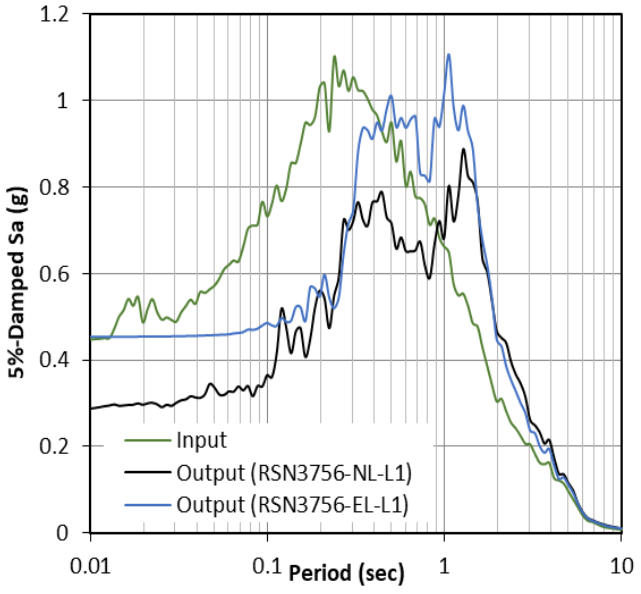
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

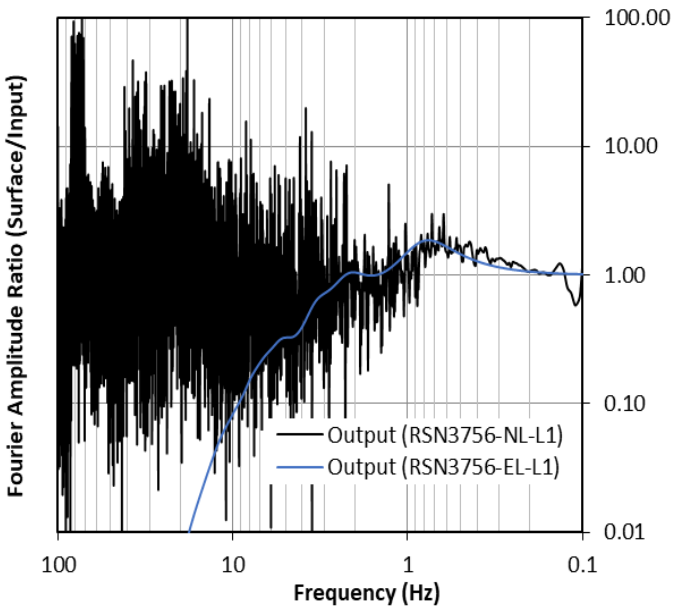
FIGURE

F-17









Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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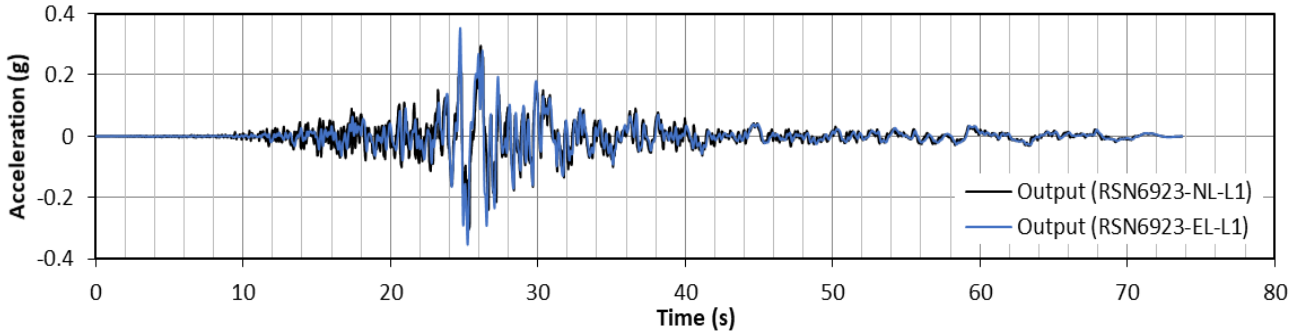
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM6 Response.ppt

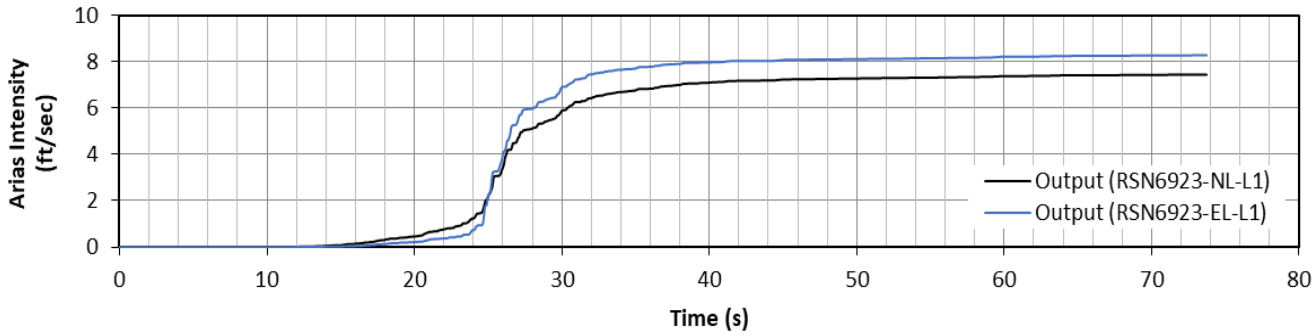
GROUND MOTION RSN3756 RESPONSE AT GROUND SURFACE

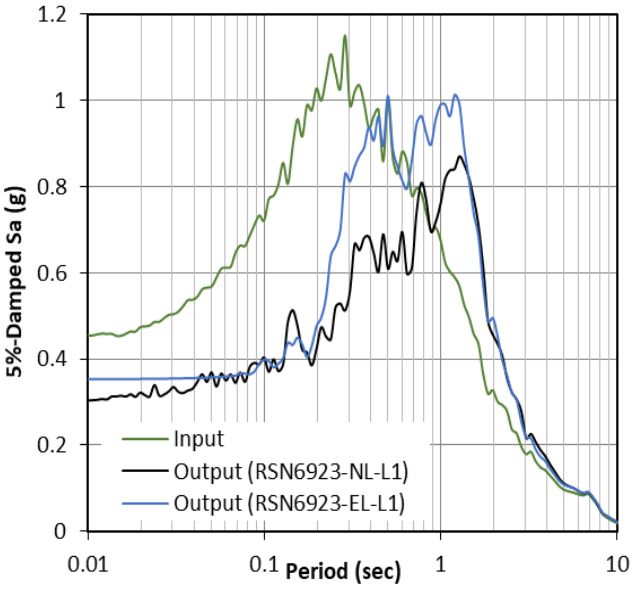
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

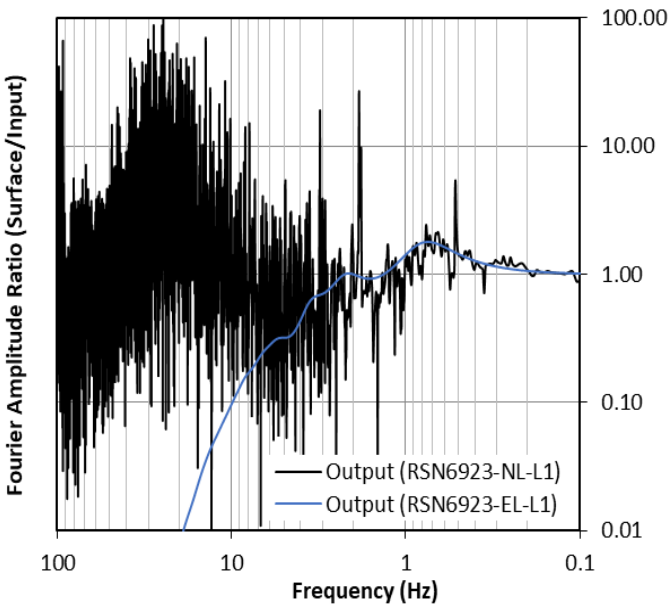
FIGURE

F-18









Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM7 Response.ppt

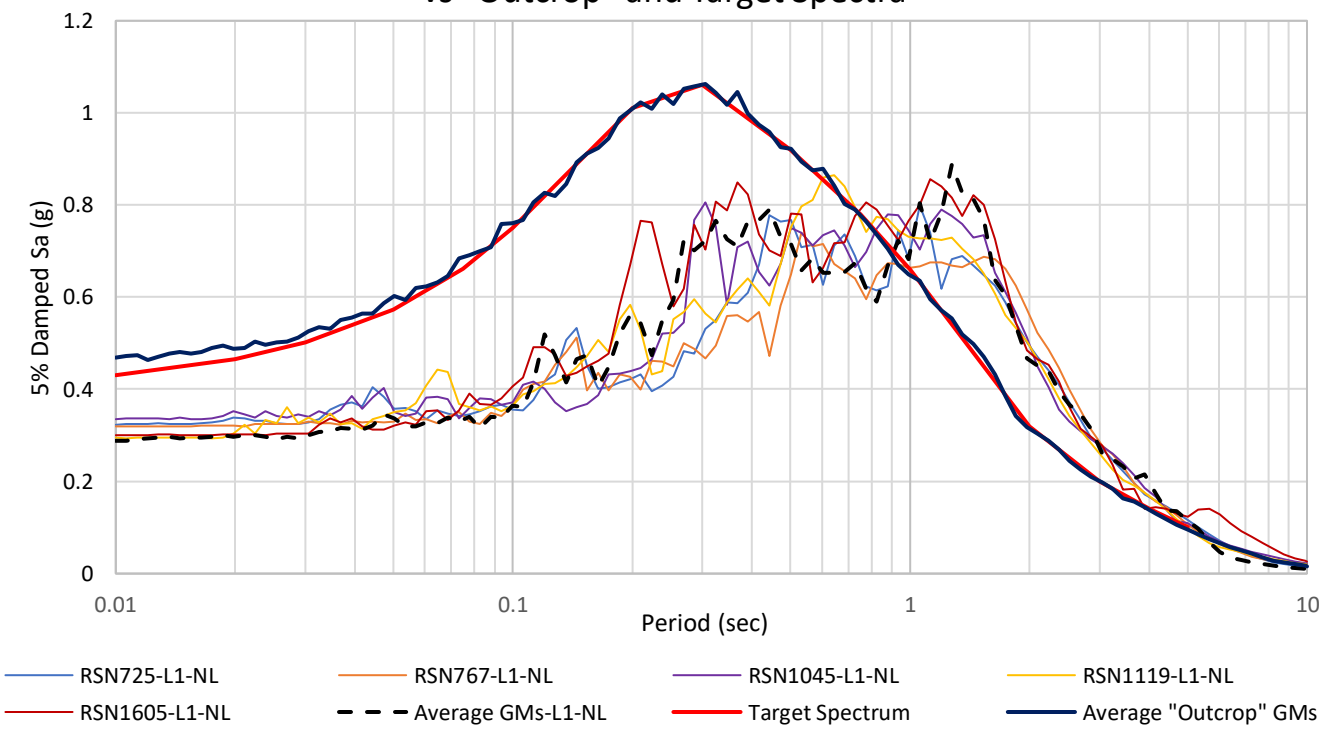
GROUND MOTION RSN6923 RESPONSE AT GROUND SURFACE

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

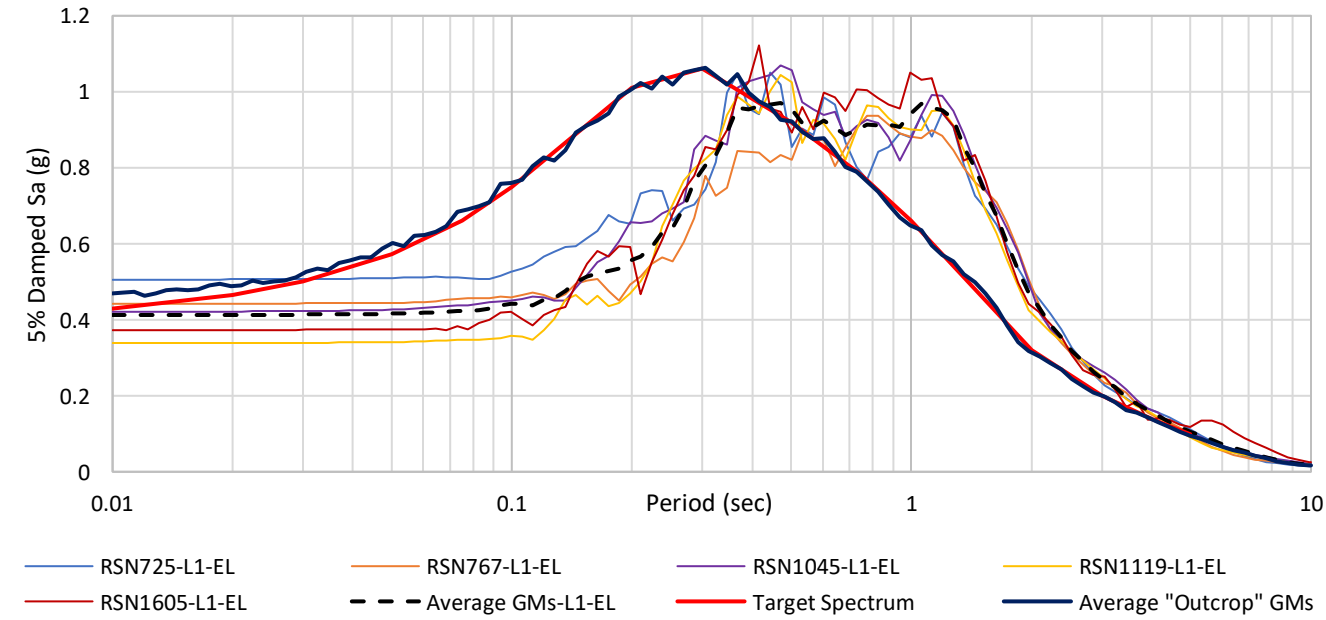
FIGURE

F-19

Non-Linear Site Response Results at Surface vs "Outcrop" and Target Spectra



Equivalent Linear Site Response Results at Surface vs "Outcrop" and Target Spectra



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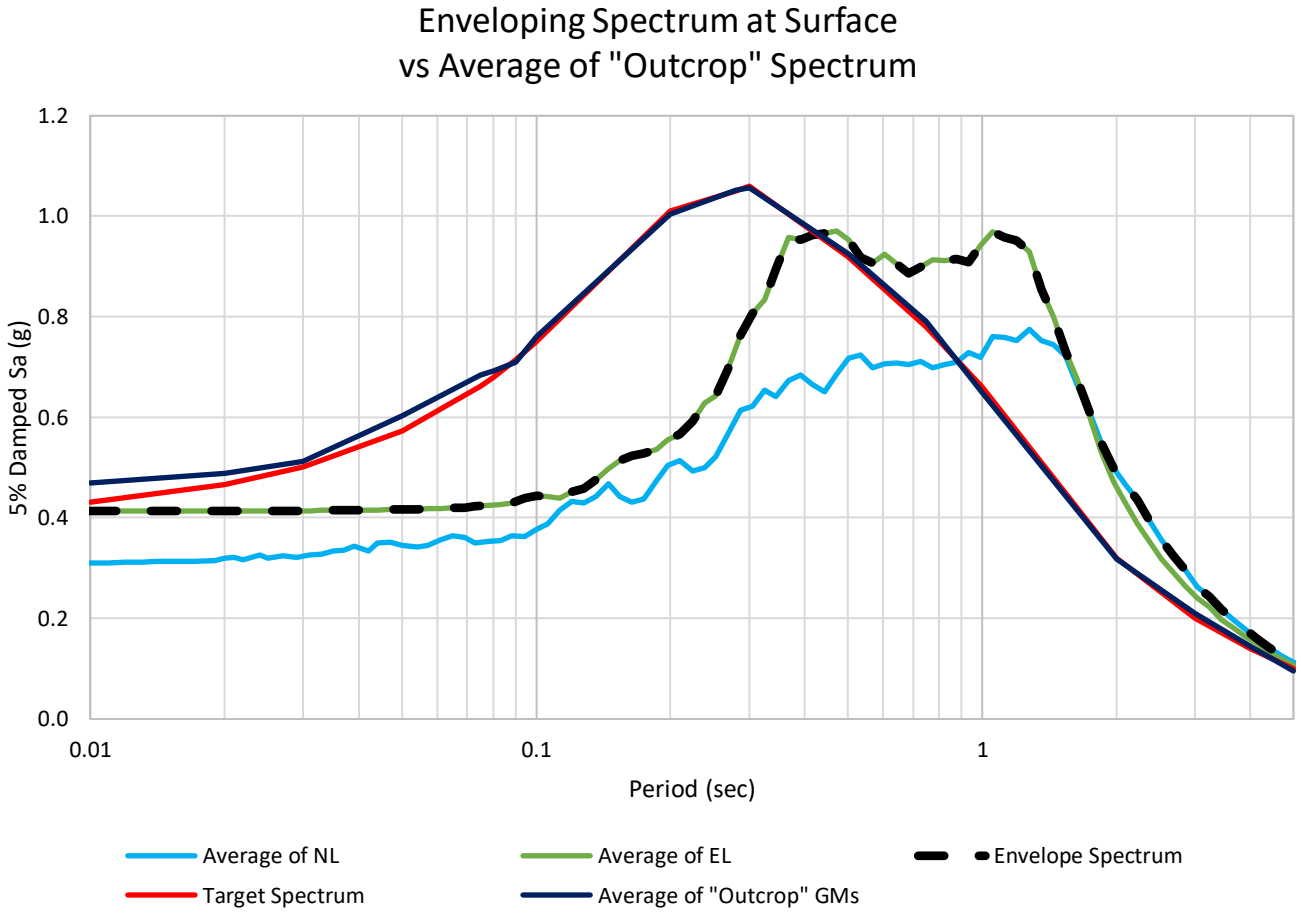
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	SiteResults.ppt

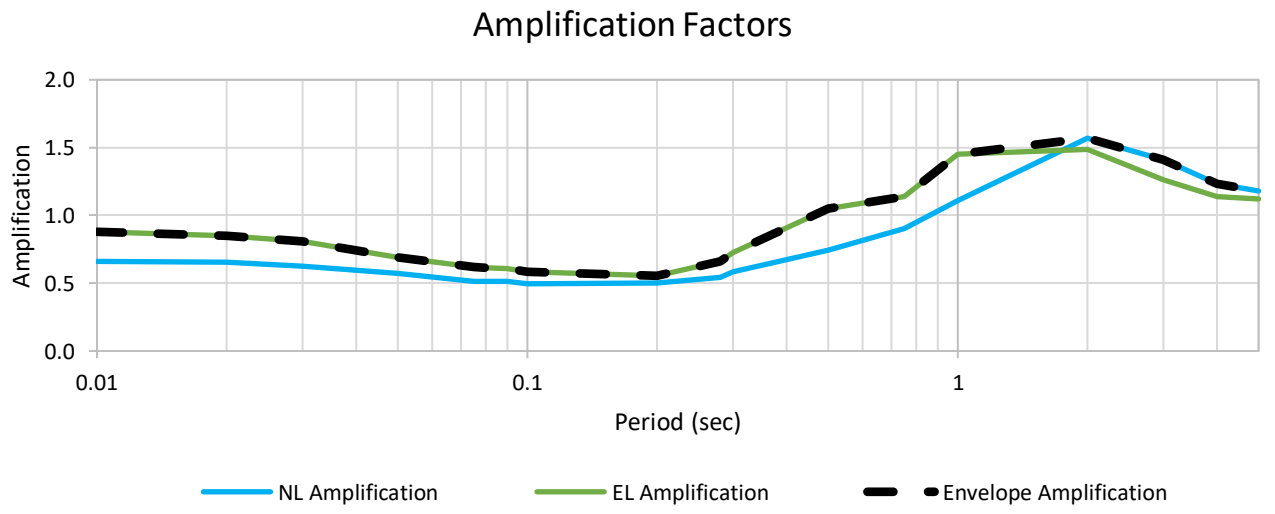
AVERAGE SITE RESPONSE RESULTS

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE

F-20





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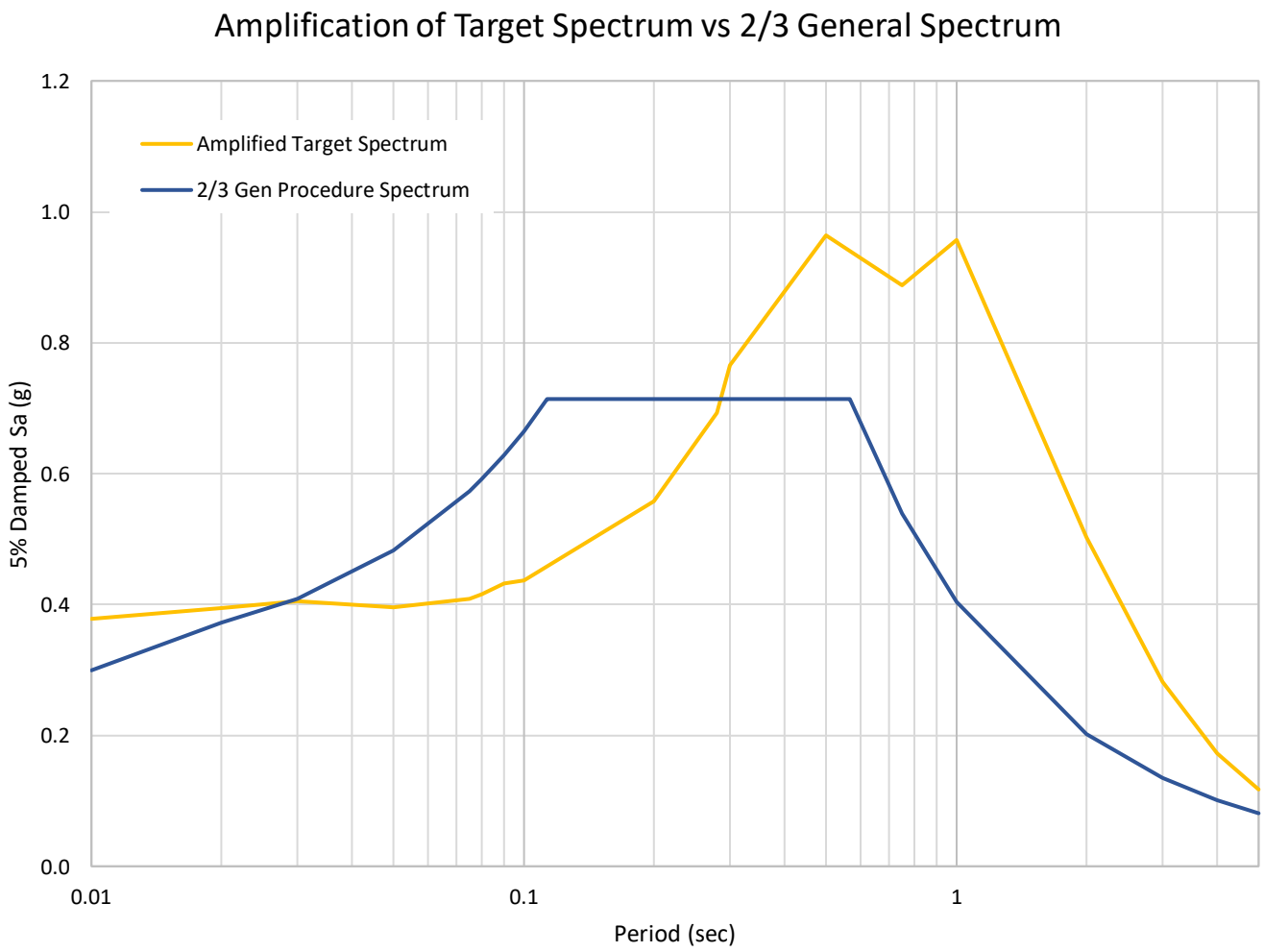
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	Amplification.ppt

ENVELOPE SPECTRUM AND SITE AMPLIFICATION RESULTS

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

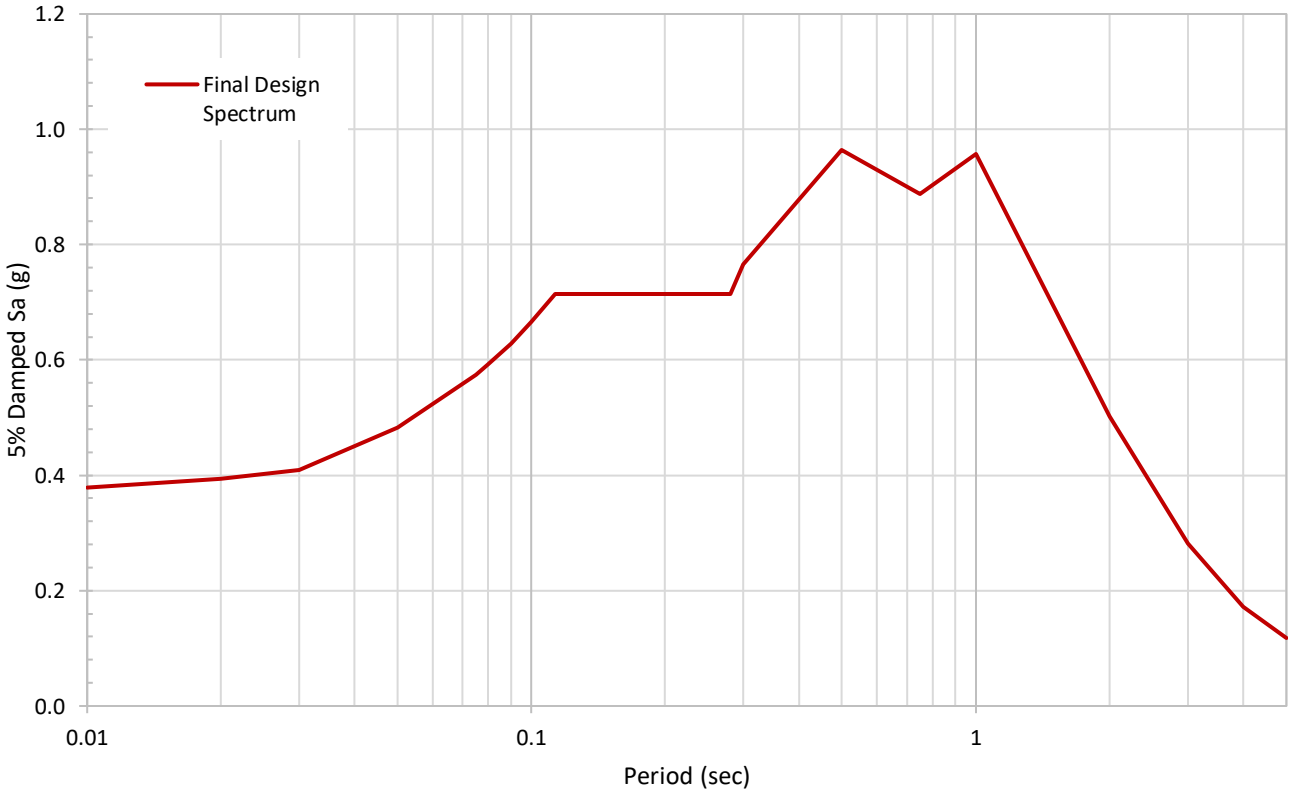
FIGURE

F-21

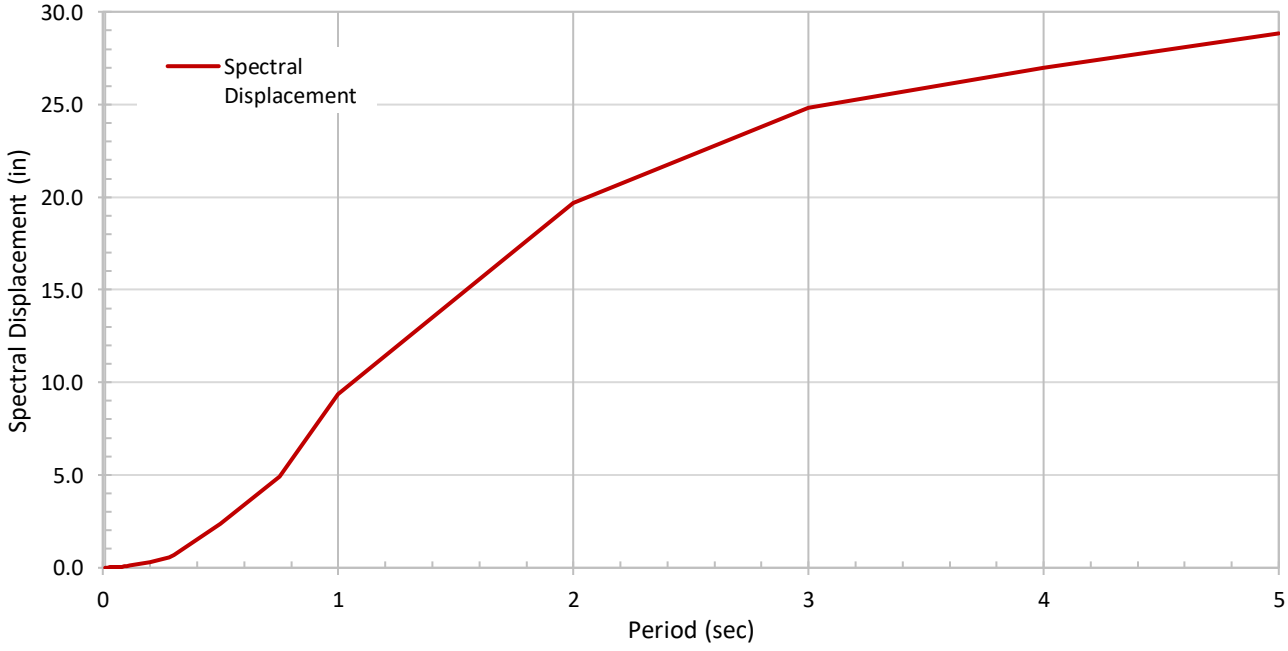


KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com	PROJECT NO. 20180876.001A	**AMPLIFICATION SPECTRUM COMPARISON TO LOWER LIMIT**	FIGURE **F-22**
	DATE: 06/2020		
	DRAWN: JLB		
	CHECKED BY: ZZ	CAMINO DEL MAR BRIDGE REPLACEMENT OVER SAN DIEGUITO RIVER - PHASE 0 DEL MAR, CALIFORNIA	
	File Name: Design Spectrum.ppt		

Design Response Spectrum



Displacement Spectrum



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PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	Design Spectrum.ppt

SITE RESPONSE DESIGN SPECTRA

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE

F-23

APPENDIX G
CALCULATIONS

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APPENDIX G
CALCULATIONS

G.1 Liquefaction and Seismic Settlement Calculations

G.1 LIQUEFACTION AND SEISMIC SETTLEMENT CALCULATIONS

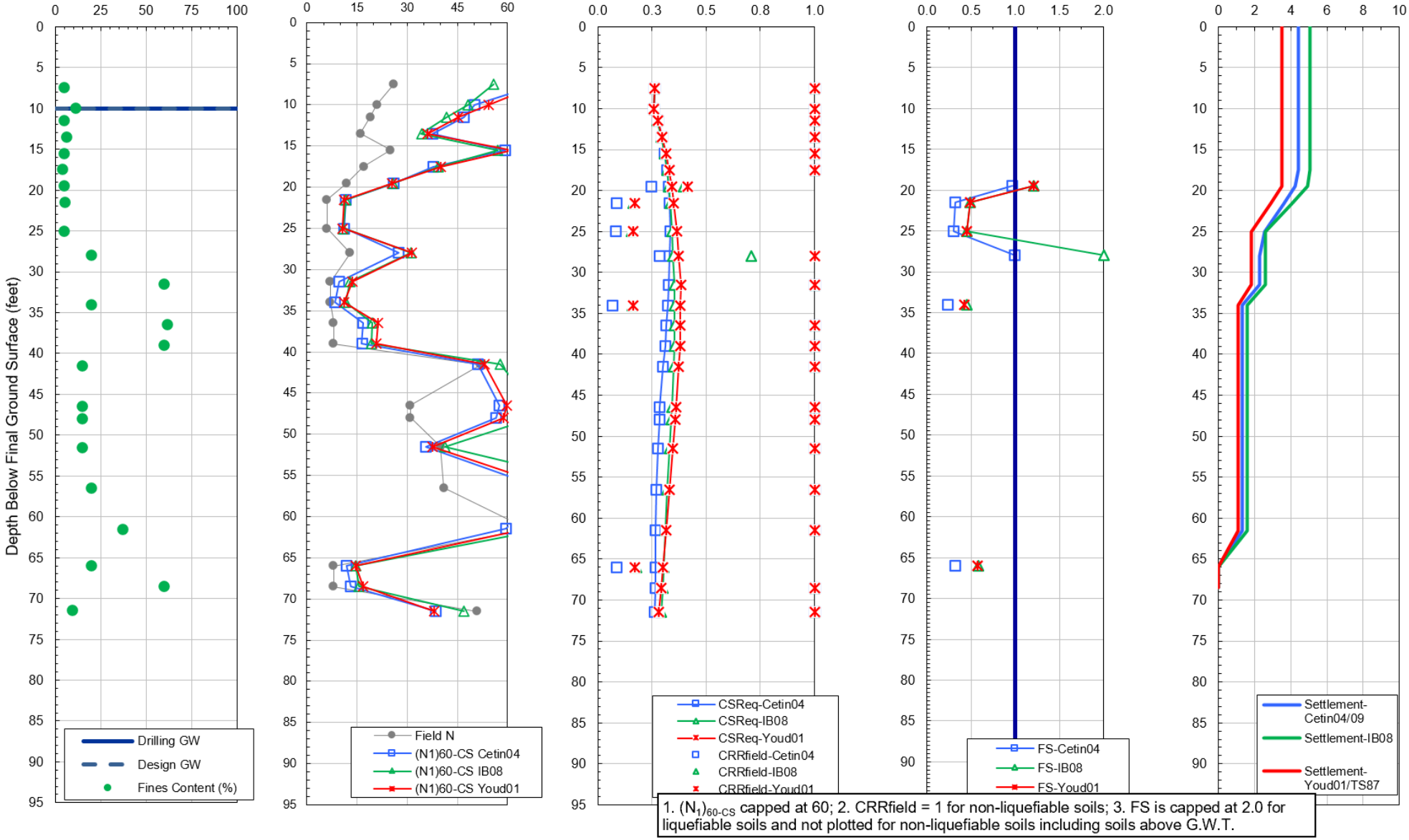
Boring ID: **R-20-001 (0 to 70 ft)**

M_w= **6.6**
PGA= **0.41g**

Groundwater Depth During Drilling (ft) = **10.0 ft**
Design Groundwater Depth (ft) = **10.0 ft**

Existing Ground Elevation = **16.0 ft**
Final Ground Elevation = **16.0 ft**

Ana. by: J. Bonfiglio
Checked by: Z. Zafir



1. $(N_1)_{60\text{-}CS}$ capped at 60; 2. CRRfield = 1 for non-liquefiable soils; 3. FS is capped at 2.0 for liquefiable soils and not plotted for non-liquefiable soils including soils above G.W.T.

KLEINFELDER
Bright People. Right Solutions.

Project Name: Camino Del Mar Bridge Replacement
Project No.: 20180876.001A
Project Location: Del Mar, California

LIQUEFACTION ANALYSIS (R-20-001)

Date 5/11/2020

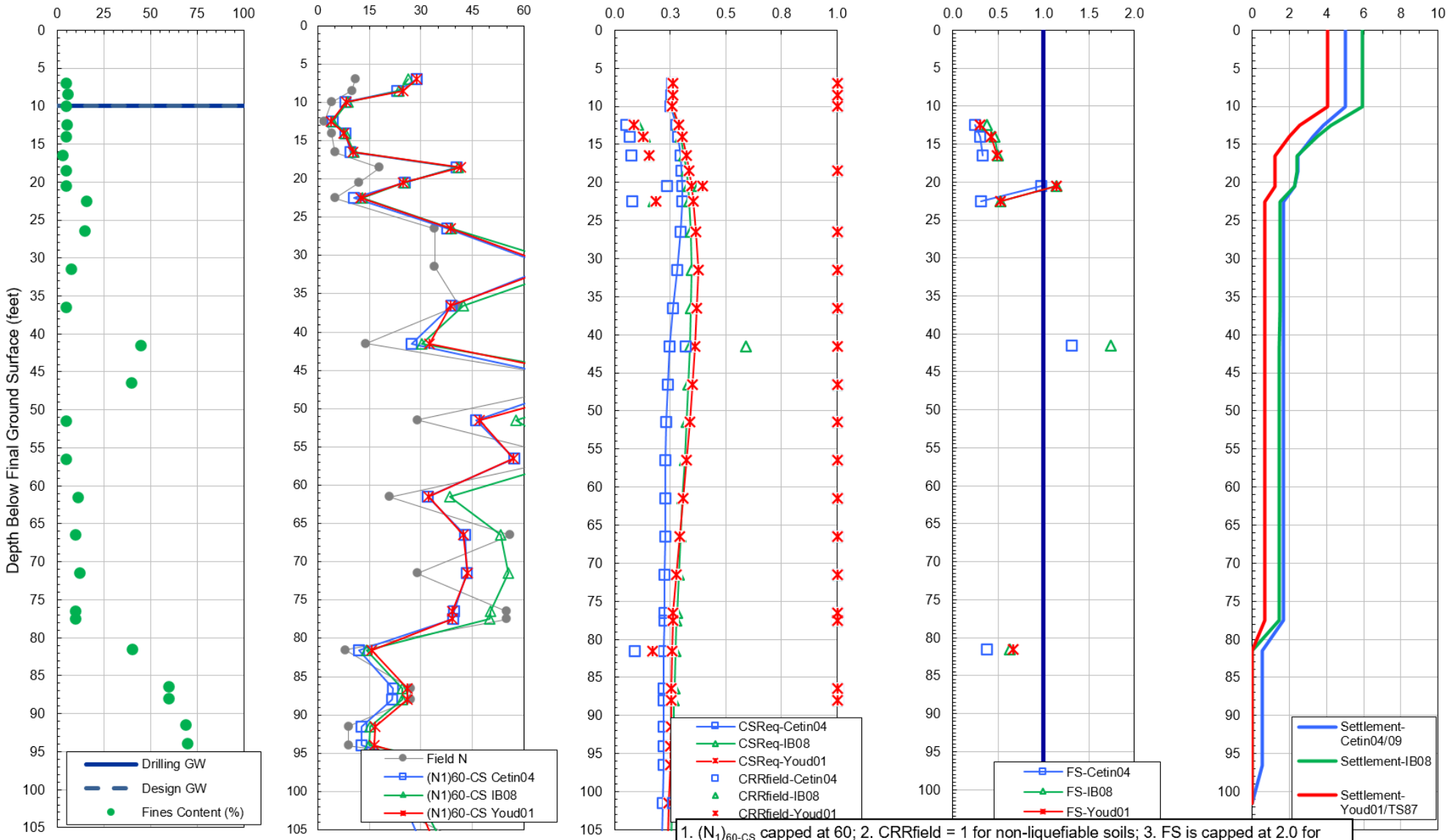
Boring ID: **R-20-002 (0 to 70 ft)**

M_w= **6.6**
PGA= **0.41g**

Groundwater Depth During Drilling (ft) = **10.0 ft**
Design Groundwater Depth (ft) = **10.0 ft**

Existing Ground Elevation = **16.0 ft**
Final Ground Elevation = **16.0 ft**

Ana. by: J. Bonfiglio
Checked by: Z. Zafir



1. $(N_1)_{60\text{-}CS}$ capped at 60; 2. CRRfield = 1 for non-liquefiable soils; 3. FS is capped at 2.0 for liquefiable soils and not plotted for non-liquefiable soils including soils above G.W.T.

KLEINFELDER
Bright People. Right Solutions.

Project Name: Camino Del Mar Bridge Replacement
Project No.: 20180876.001A
Project Location: Del Mar, California

LIQUEFACTION ANALYSIS (R-20-002)

Date 5/11/2020

Seismic Settlement of Dry Sands
Tokimatsu & Seed (1987)

Project No. 20180876.001A
Project Name Camino Del Mar Bridge Replacement
Analysis by J. Bonfiglio
Checked by Z. Zafir

M =	6.63	Moment Magnitude (Use Modal value)
PHA =	0.41	g (Peak horizontal acceleration; use PGA_M)
γ =	120	pcf (unit weight of soil)
Ko =	0.5	(at-rest coefficient)

Boring	Depth at middle of sampler (ft)	Layer Thickness (ft)	Soil Classification	Anticipated Fines Content (%)	r_d	σ_0 (psf)	σ'_m (psf)	σ'_m (tsf)	N (blows/ft)	SAMPLER TYPE (1) SPT w/out liners (2) SPT w/ liners (3) MC (4) CAL	Sampler Correction, C_S	Overbuden Correction, C_N	Fine Content Correction	N_1 (blows/ft)	Gmax (psf)	Effective Shear Strain, γ_{eff} (Geff/Gmax)	Effective Shear Strain, γ_{eff} (from Fig. 11)	Effective Shear Strain, γ_{eff} (%)	Volumetric Strain (from Figure 13) (%)	Results: Seismic Settlement for M7.5 (in)	Seismic Settlement for M5.25 (in)	Seismic Settlement for M6 (in)	Seismic Settlement for M6.75 (in)	Seismic Settlement for M8.5 (in)
R-20-001	3	6	SP-SM	5	0.993	360	240	0.12	26	1	1.1	1.70	1.0	50	1138556	8.37E-05	1.6E-04	1.6E-02	0.0000	0.000	0.00	0.00	0.00	0.00
R-20-001	7	2	SP-SM	5	0.985	840	560	0.28	26	1	1.1	1.54	1.0	45	1685058	1.31E-04	1.9E-04	1.9E-02	0.0000	0.000	0.00	0.00	0.00	0.00
R-20-001	9	2	SP-SM	11	0.980	1080	720	0.36	21	1	1.1	1.36	1.1	33	1712637	1.65E-04	2.9E-04	2.9E-02	0.0150	0.007	0.00	0.00	0.01	0.01
																				0.000	0.00	0.00	0.00	0.00
																				0.000	0.00	0.00	0.00	0.00
																				0.00	0.00	0.00	0.00	0.00
																				0.00	0.00	0.00	0.00	0.00
																				0.007	0.00	0.00	0.01	0.01

Double the value for bi-directional shaking
Select= 0.01 for M 6.63

(use to read Fig. 11) (use to read Fig. 13) (use to read Fig. 11) (use to read Fig. 13)

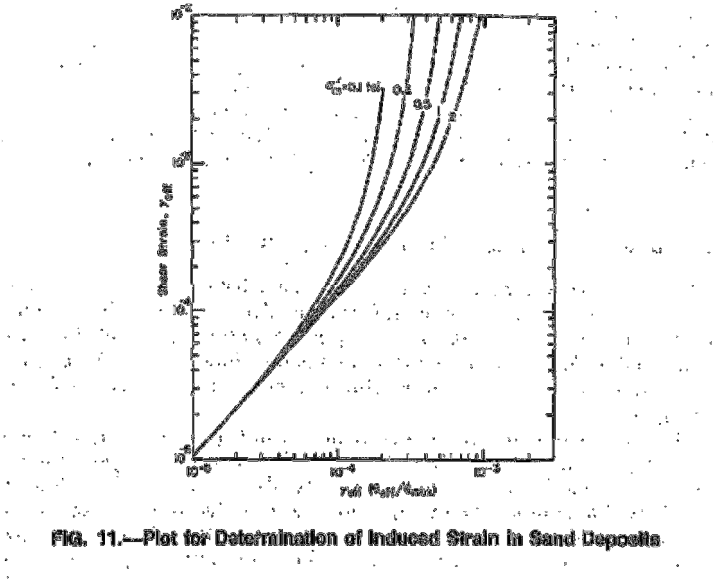


FIG. 11.—Plot for Determination of Induced Strain in Sand Deposits

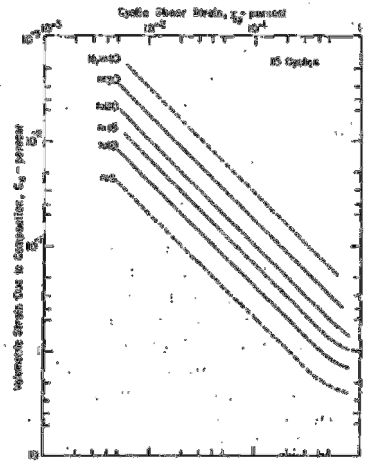


FIG. 13.—Relationship between Volumetric Strain, Shear Strain, and Penetration Resistance for Dry Sands

Seismic Settlement of Dry Sands
Tokimatsu & Seed (1987)

Project No. 20180876.001A
Project Name Camino Del Mar Bridge Replacemer
Analysis by J. Bonfiglio
Checked by Z. Zafir

M =	6.63	Moment Magnitude (Use Modal value
PHA =	0.41	g (Peak horizontal acceleration; use PG_{M})
γ =	120	pcf (unit weight of soil)
Ko =	0.5	(at-rest coefficient)

Boring	Depth at middle of sampler (ft)	Layer Thickness (ft)	Soil Classification	Anticipated Fines Content (%)	r_d	σ_o (psf)	σ'_m (psf)	σ'_m (tsf)	N (blows/ft)	SAMPLER TYPE (1) SPT w/out liners (2) SPT w/ liners (3) MC (4) CAL	Sampler Correction, C_S	Overbuden Correction, C_N	Fine Content Correction	N_1 (blows/ft)	Gmax (psf)	Effective Shear Strain, γ_{eff} (Geff/Gmax)	Effective Shear Strain, γ_{eff} (from Fig. 11)	Effective Shear Strain, γ_{eff} (%)	Volumetric Strain (from Figure 13) (%)	Results: Seismic Settlement for M7.5 (in)	Seismic Settlement for M5.25 (in)	Seismic Settlement for M6 (in)	Seismic Settlement for M6.75 (in)	Seismic Settlement for M8.5 (in)
R-20-002	2.5	5	SP	3.3	0.995	300	200	0.10	10	1	1.1	1.70	1.0	20	763895	1.04E-04	2.4E-04	2.4E-02	0.0250	0.030	0.01	0.02	0.03	0.04
R-20-002	6	2	SP-SM	5	0.987	720	480	0.24	11	1	1.1	1.67	1.0	21	1212090	1.56E-04	2.7E-04	2.7E-02	0.0250	0.012	0.00	0.01	0.01	0.02
R-20-002	8	2	SP-SM	5.6	0.983	960	640	0.32	10	1	1.1	1.44	1.0	17	1297835	1.94E-04	4.8E-04	4.8E-02	0.0550	0.026	0.01	0.02	0.02	0.03
R-20-002	9.5	1	SP-SM	5	0.979	1140	760	0.38	4	1	1.1	1.32	1.0	7	1046004	2.84E-04	1.2E-03	1.2E-01	0.4000	0.096	0.04	0.06	0.08	0.12
																				0.000	0.00	0.00	0.00	0.00
																				0.00	0.00	0.00	0.00	0.00
																				0.00	0.00	0.00	0.00	0.00
																				0.164	0.07	0.10	0.14	0.21

Double the value for bi-directional shakin
Select= 0.27 for M 6.63

(use to read Fig. 11)

(use to read Fig. 13)

(use to read Fig. 11)

(use to read Fig. 13)

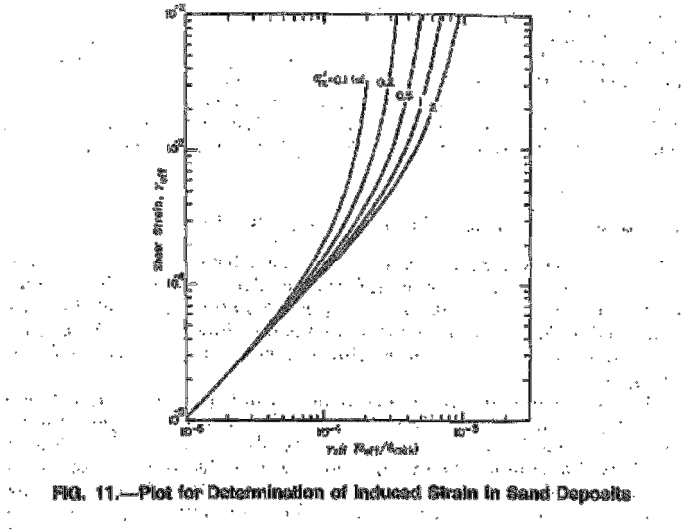


FIG. 11.—Plot for Determination of Induced Strain in Sand Deposits

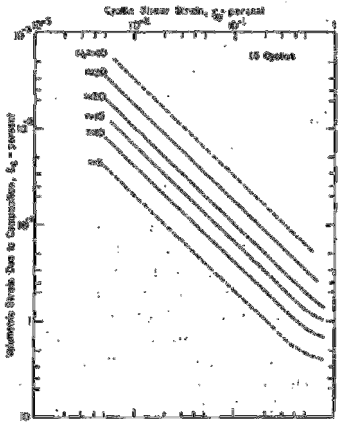
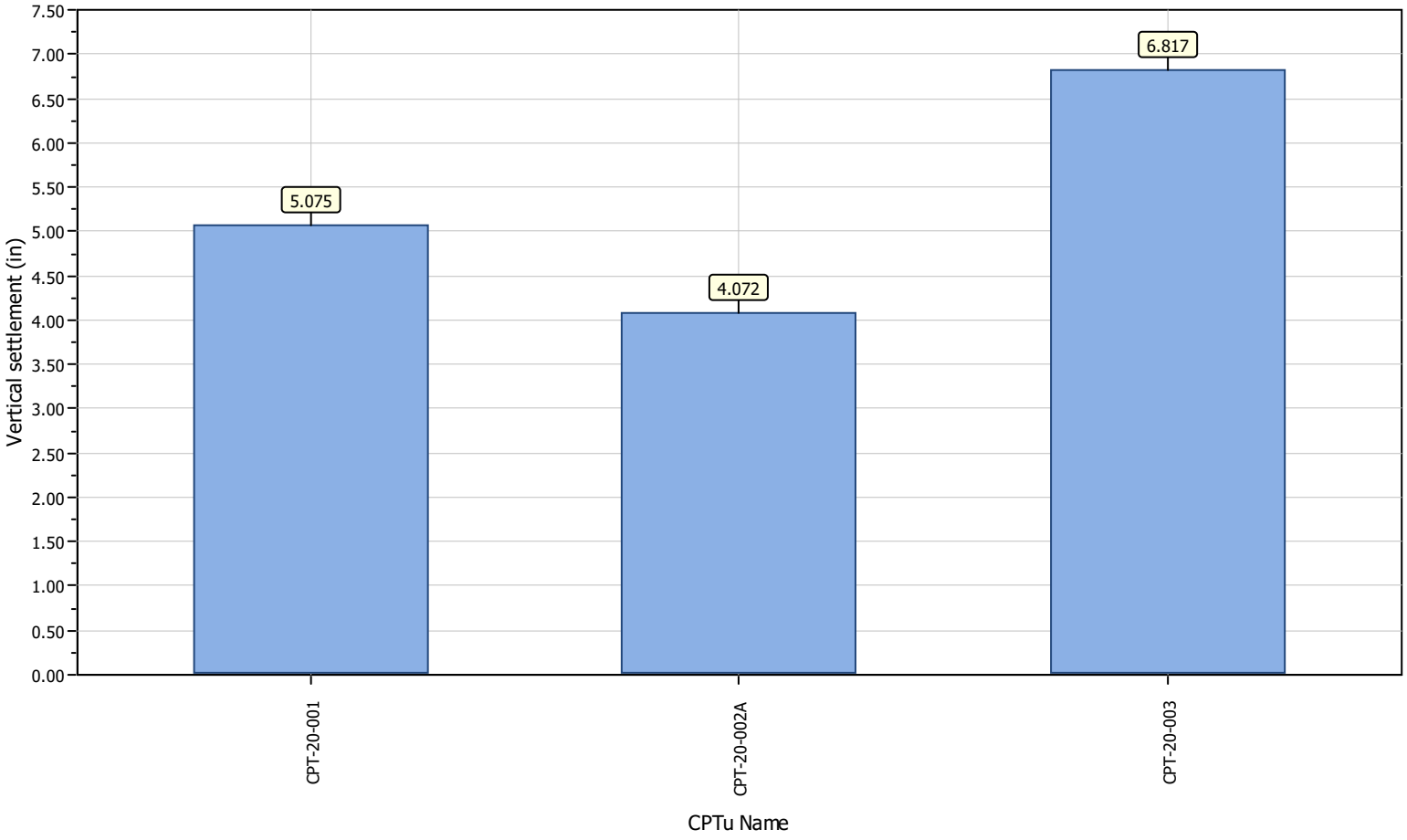


FIG. 13.—Relationship between Volumetric Strain, Shear Strain, and Penetration Resistance for Dry Sands

Project title : Camino Del Mar Bridge Replacement

Location : Del Mar, CA

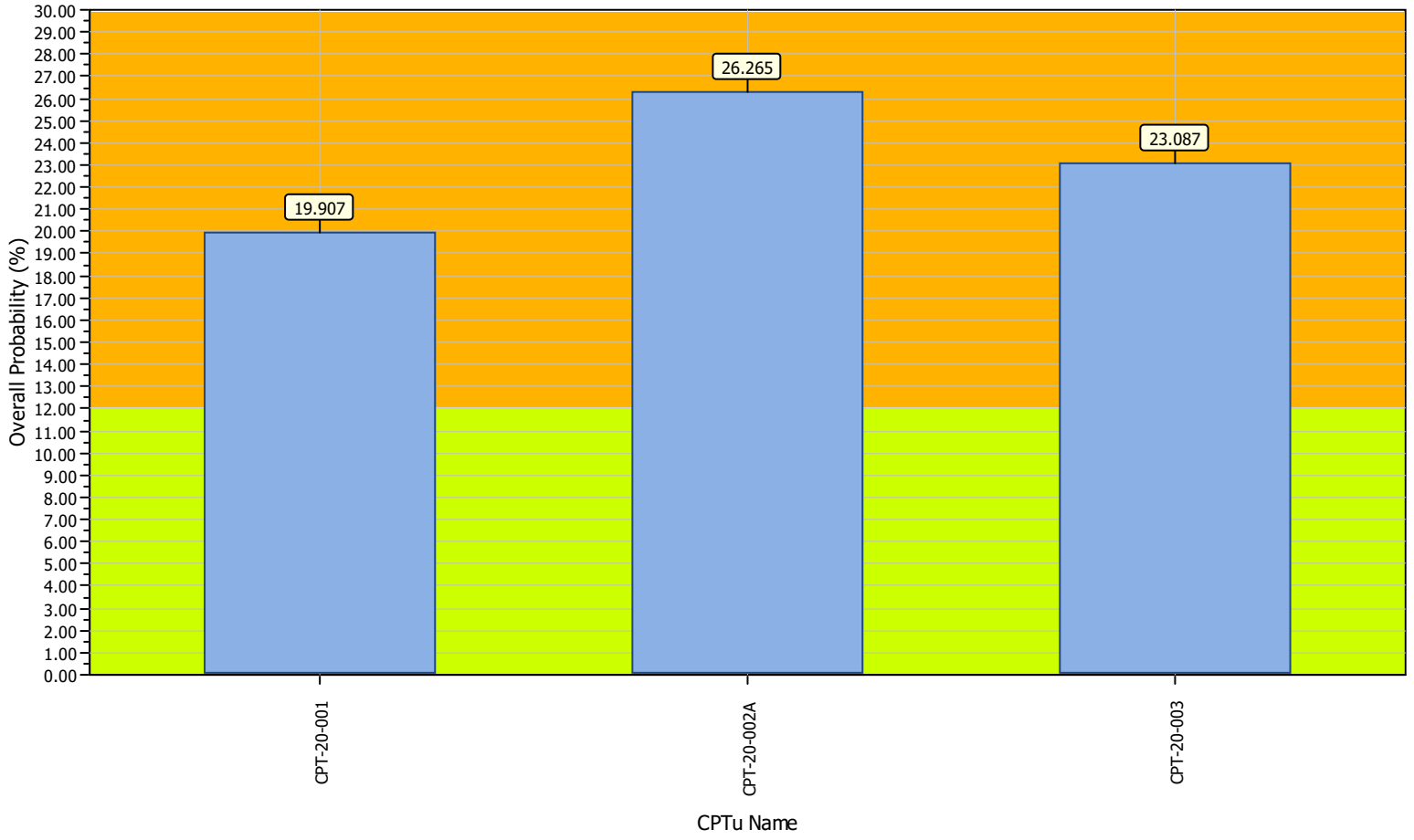
Overall vertical settlements report



Project title : Camino Del Mar Bridge Replacement

Location : Del Mar, CA

Overall Probability for Liquefaction report



Probability color scheme

- Very High Probability
- High Probability
- Low Probability

Basic statistics

Total CPT number: 3

0% low probability

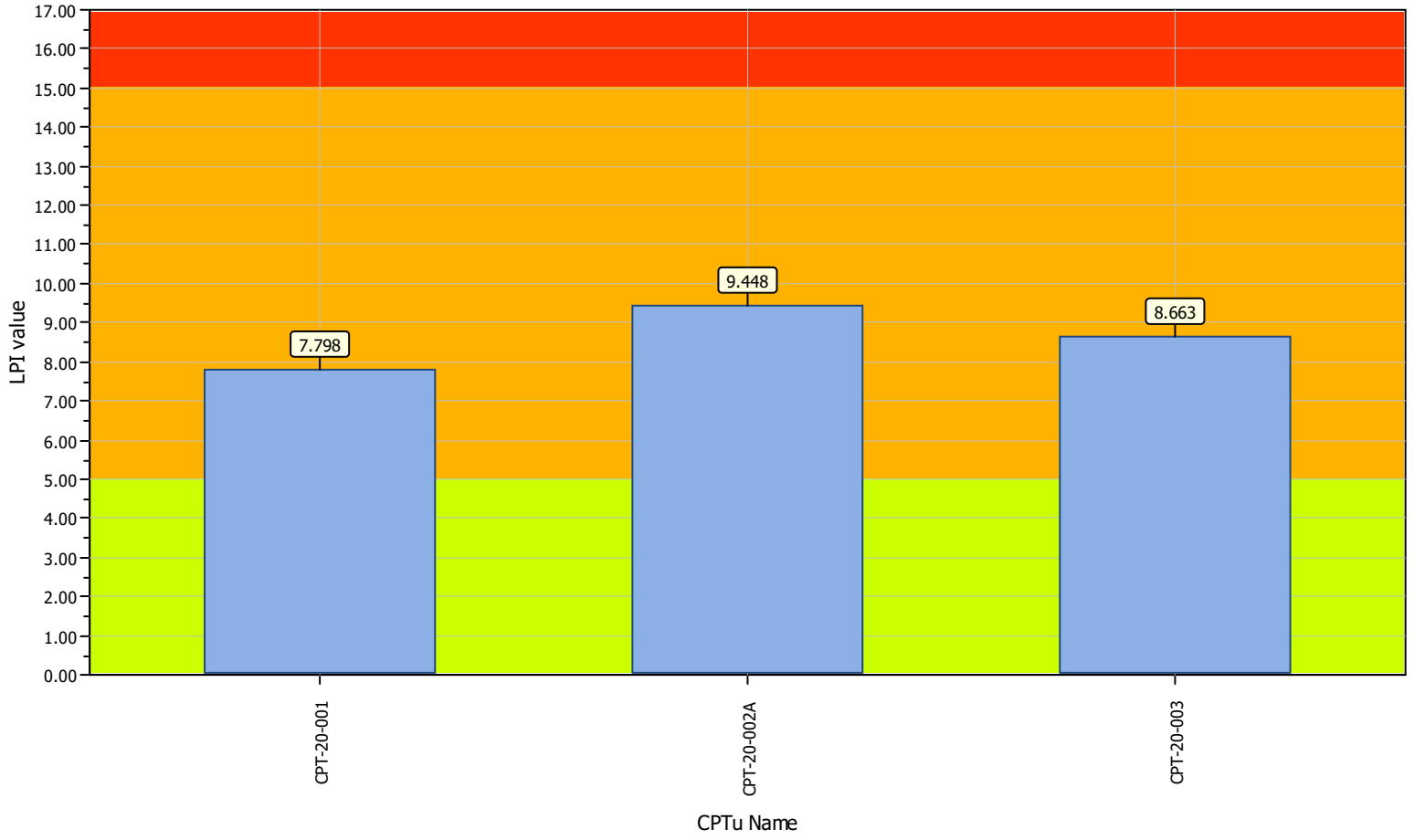
100% high probability

0% very high probability

Project title : Camino Del Mar Bridge Replacement

Location : Del Mar, CA

Overall Liquefaction Potential Index report



LPI color scheme

- Very high risk
- High risk
- Low risk

Basic statistics

Total CPT number: 3

0% low risk

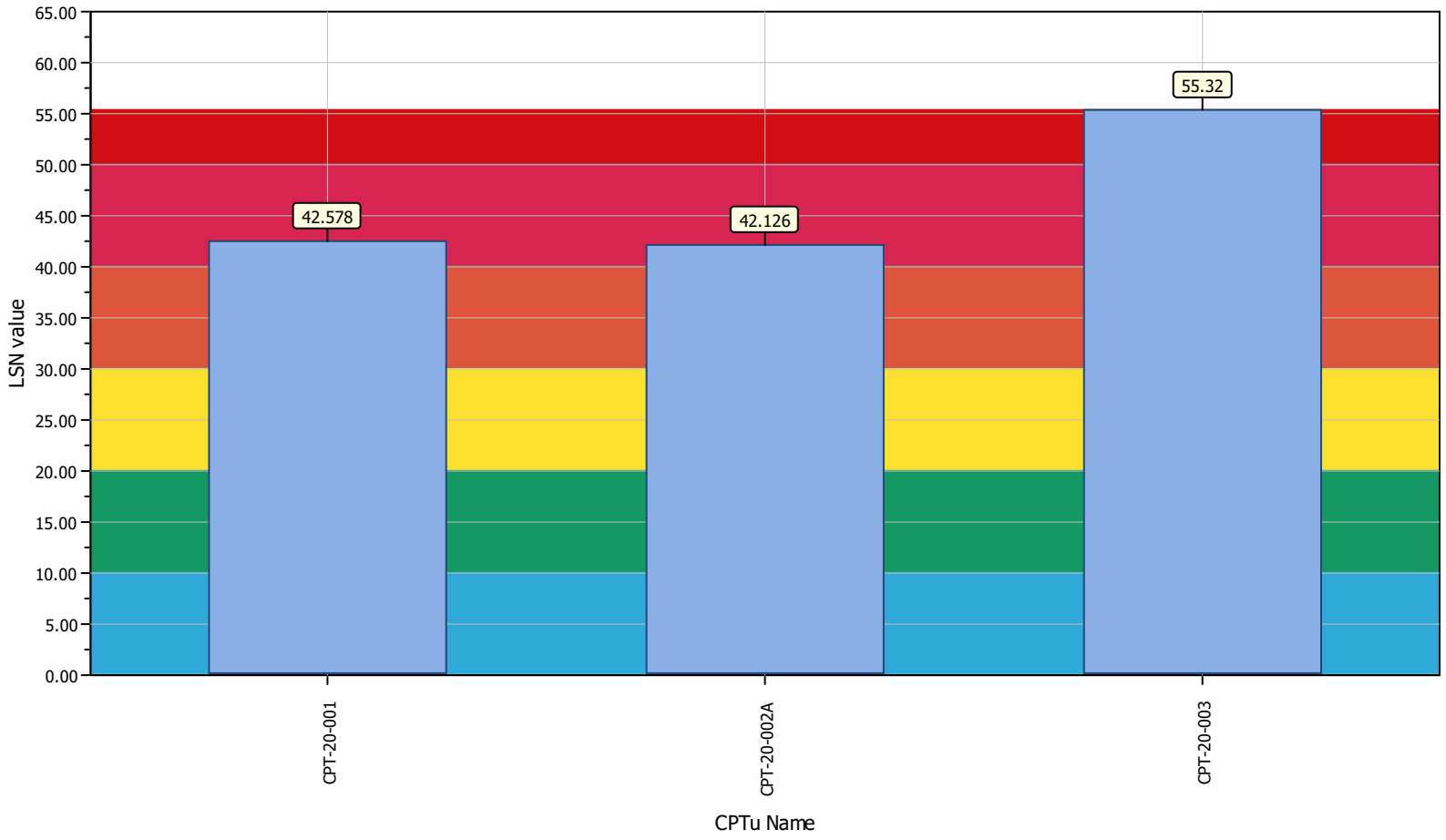
100% high risk

0% very high risk

Project title : Camino Del Mar Bridge Replacement

Location : Del Mar, CA

Overall Liquefaction Severity Number report



LSN color scheme

- Severe damage
- Major expression of liquefaction
- Moderate to severe exp. of liquefaction
- Moderate expression of liquefaction
- Minor expression of liquefaction
- Little to no expression of liquefaction

Basic statistics

Total CPT number: 3

0% little liquefaction

0% minor liquefaction

0% moderate liquefaction

0% moderate to major liquefaction

67% major liquefaction

33% severe liquefaction

GEOLOGISMIKI Geotechnical Software

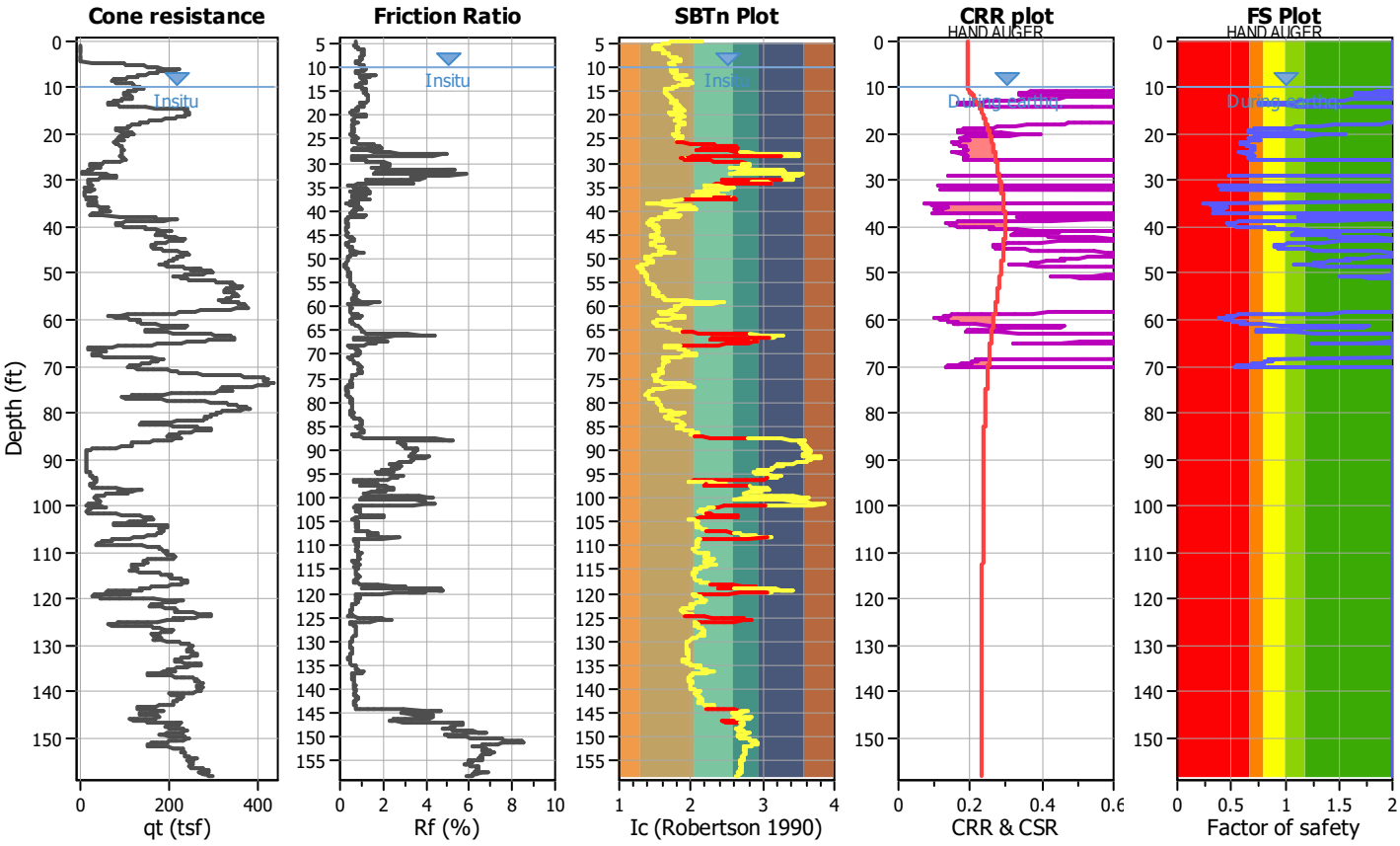
LIQUEFACTION ANALYSIS REPORT

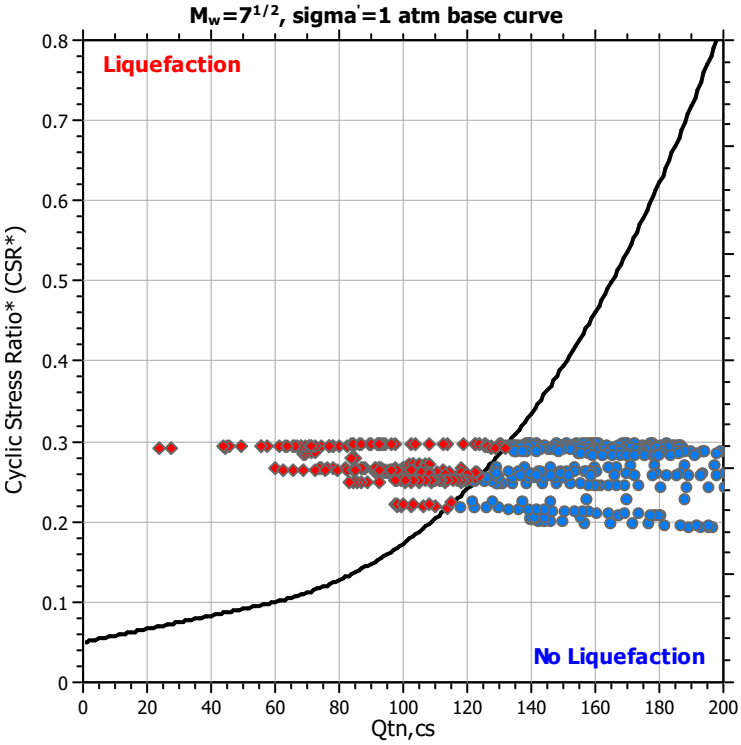
Project title : Camino Del Mar Bridge Replacement **Location : Del Mar, CA**

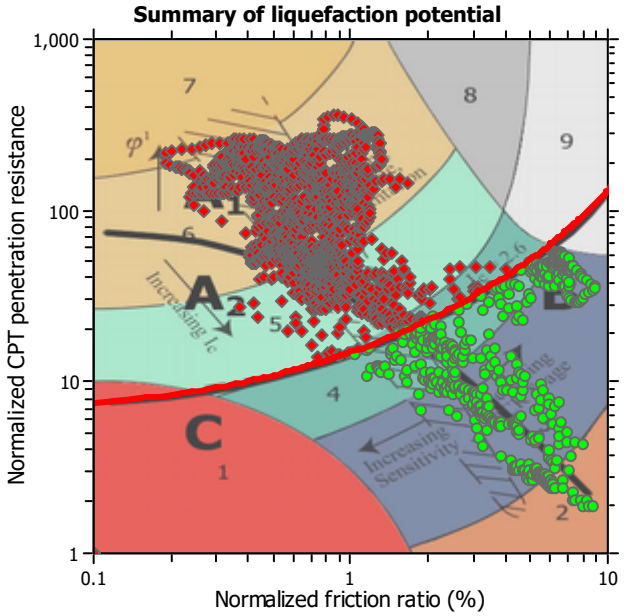
CPT file : CPT-20-001

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	70.00 ft
Earthquake magnitude M_w:	6.63	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.41	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

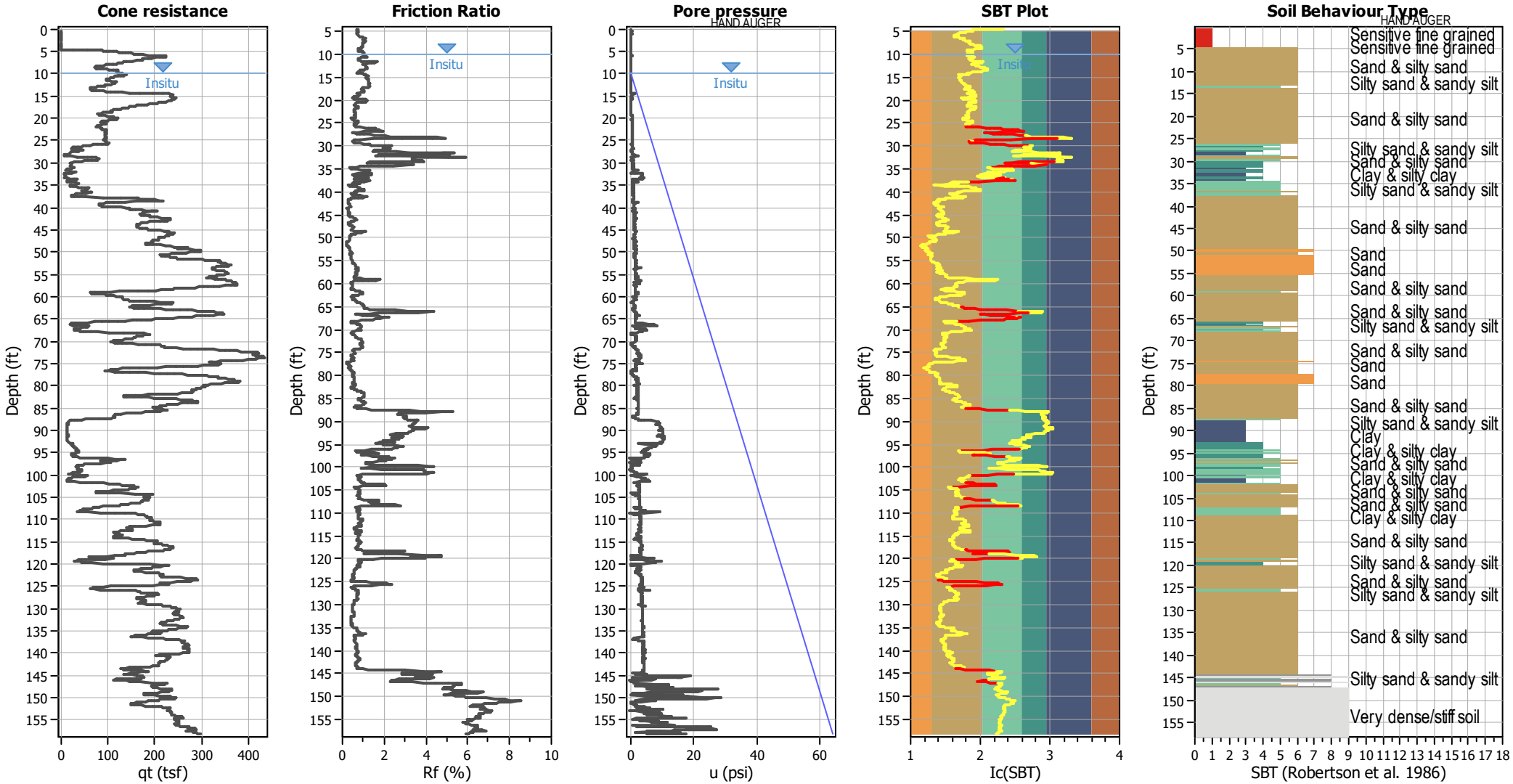






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



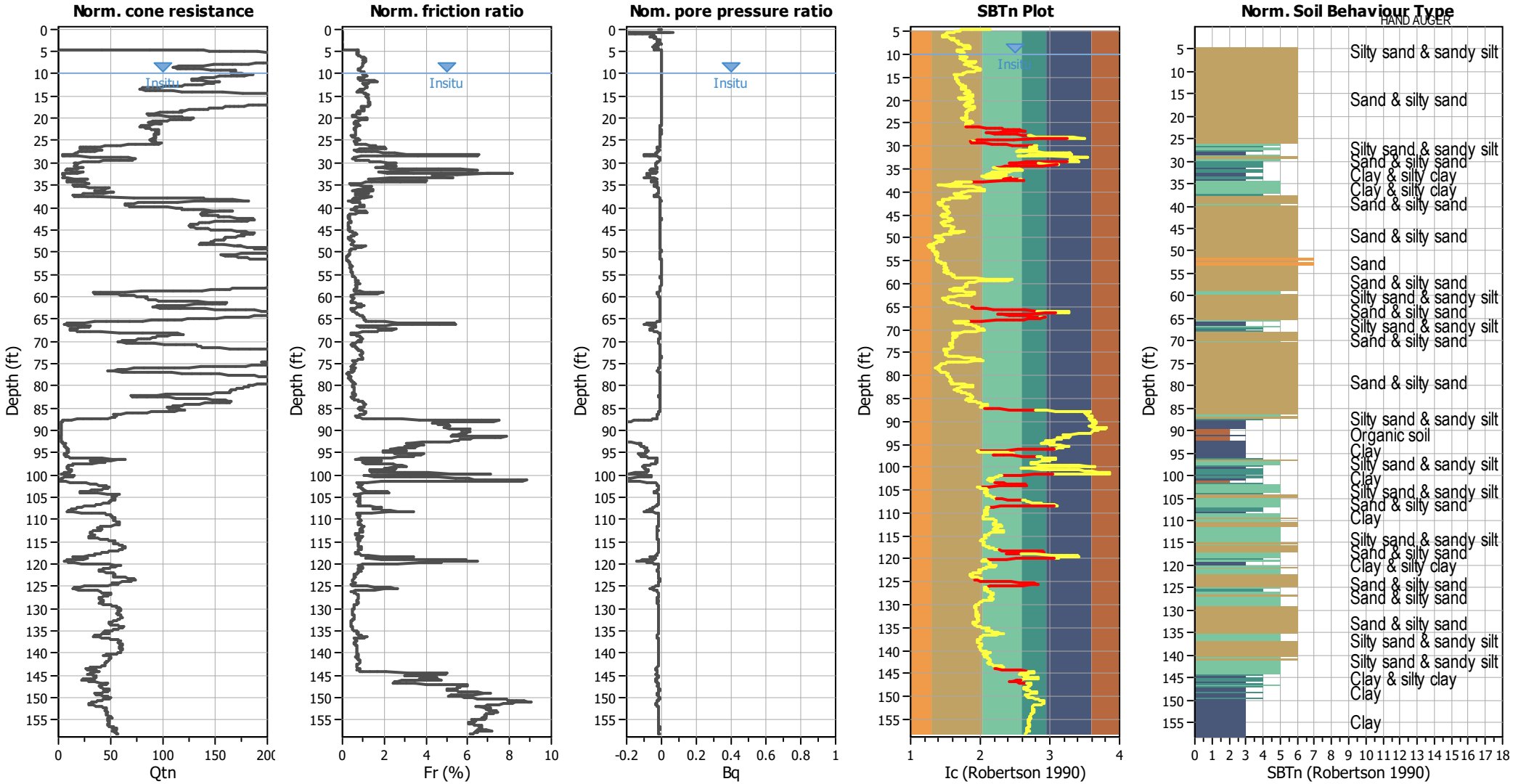
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



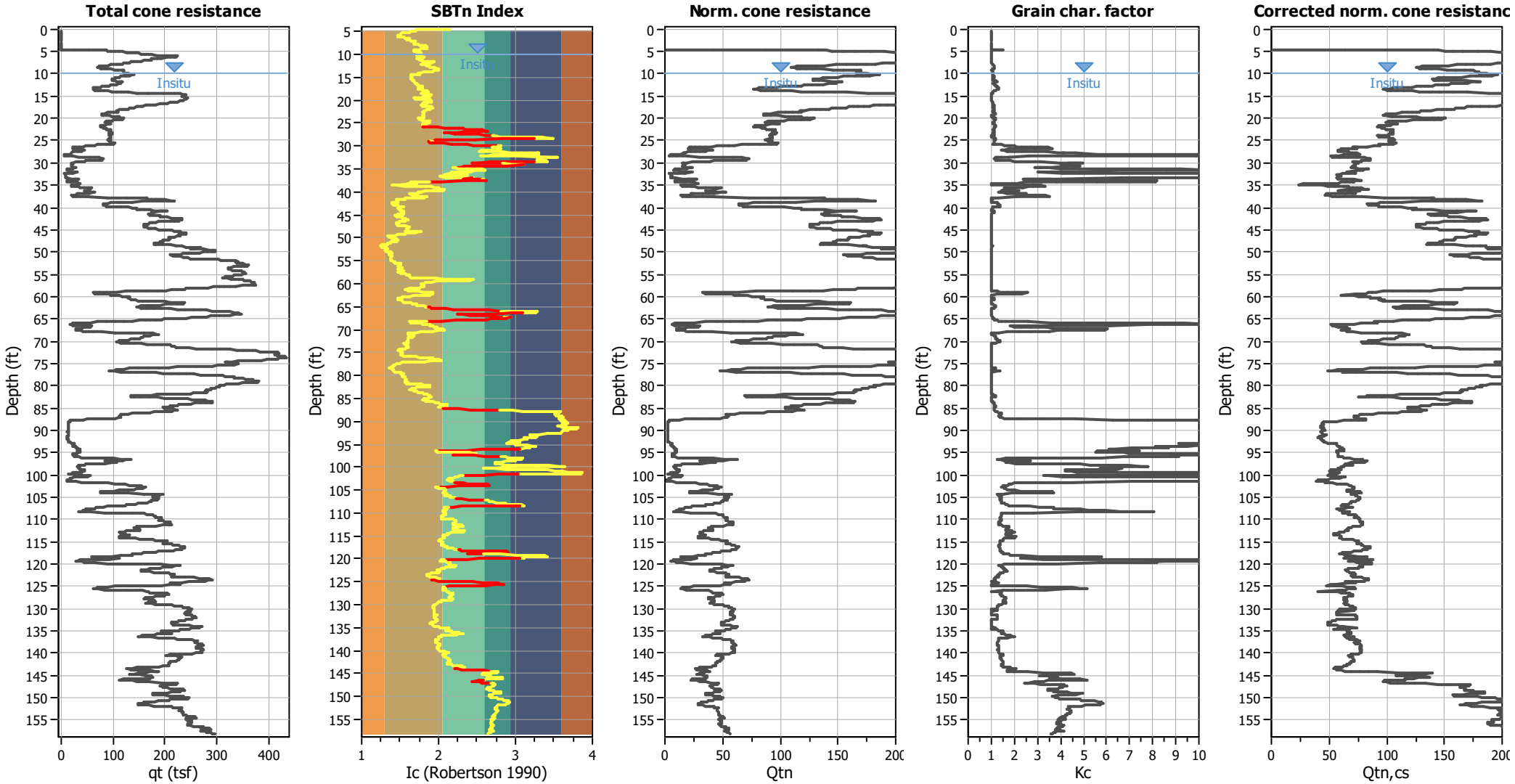
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

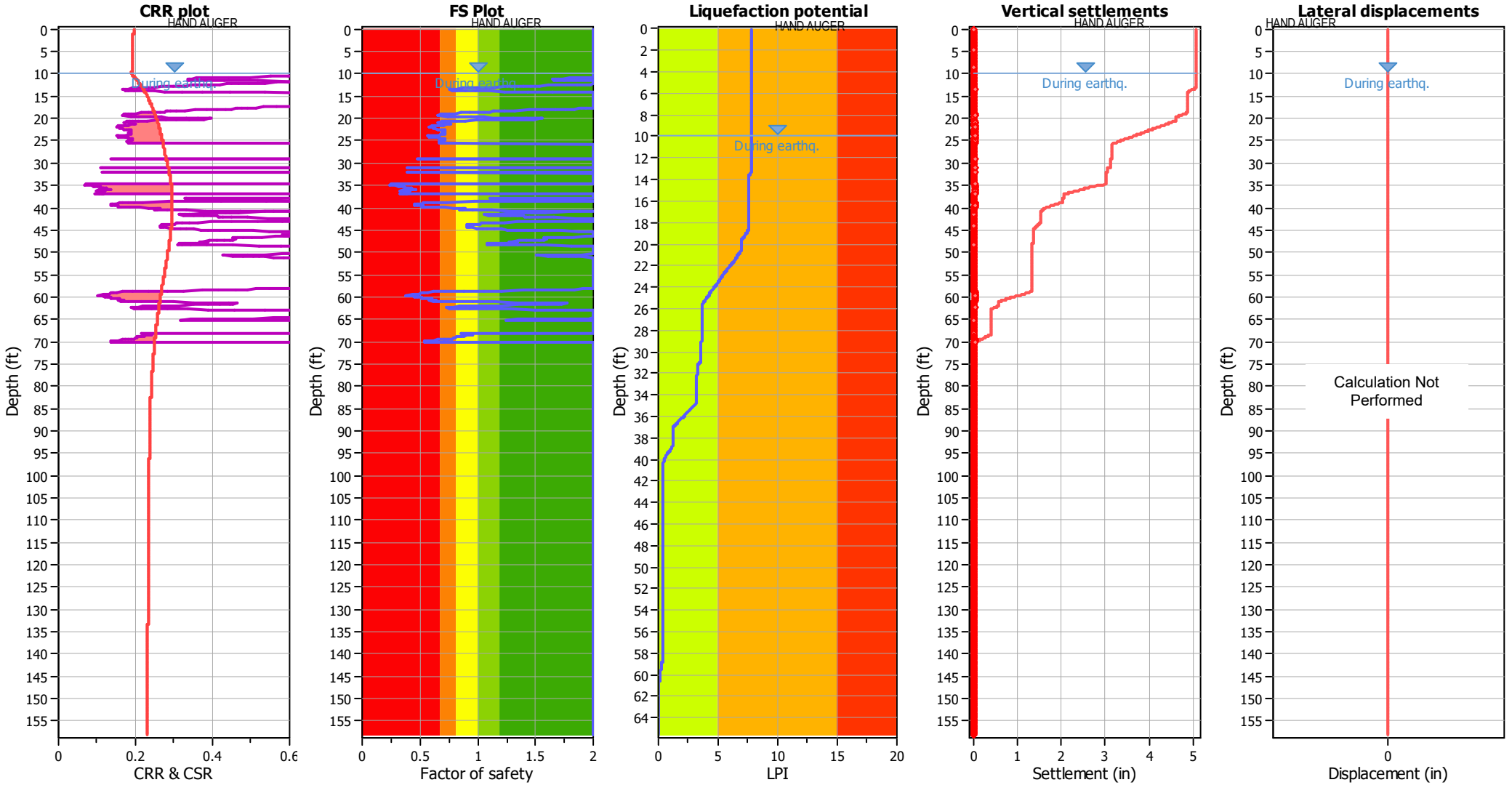
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

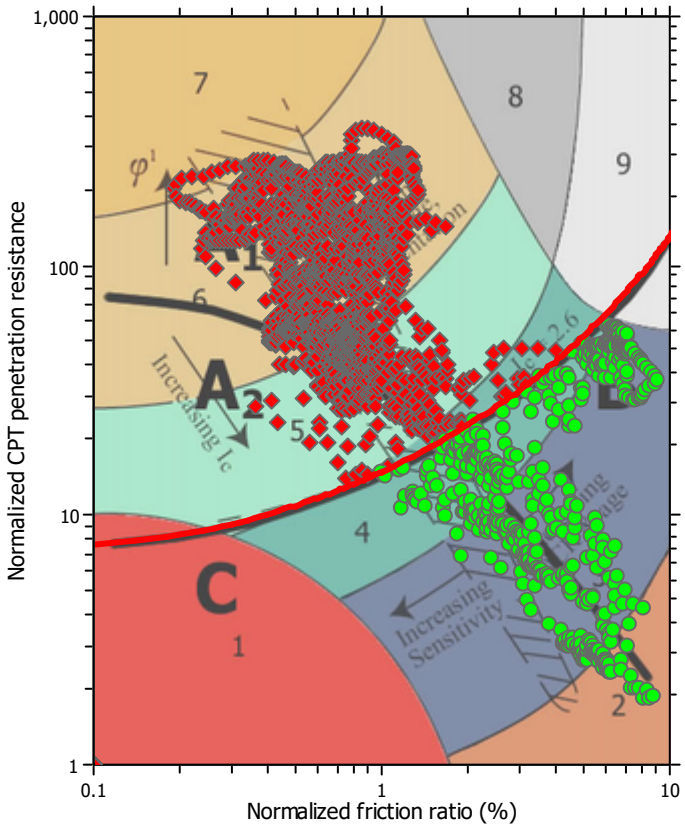
F.S. color scheme

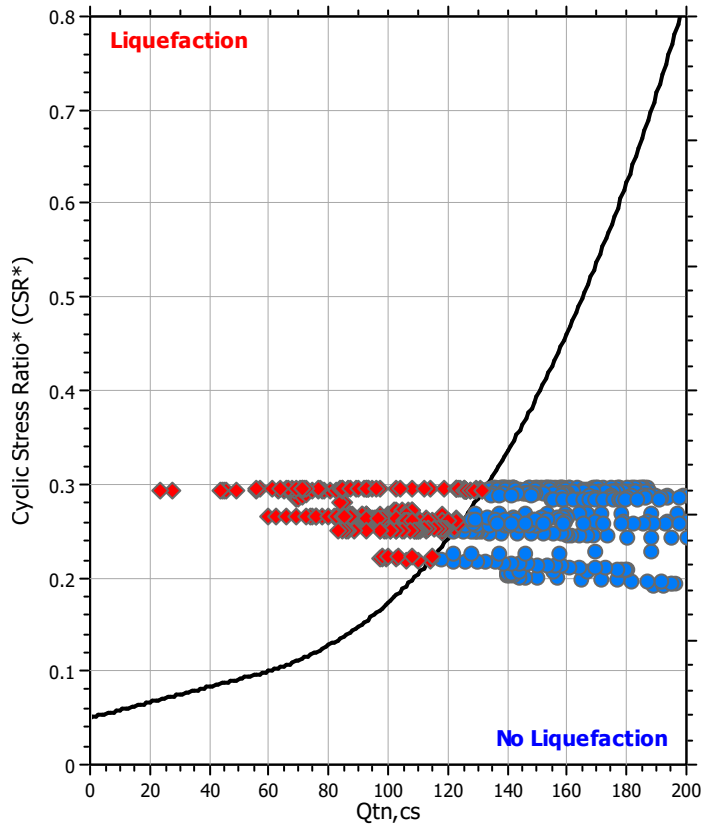
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

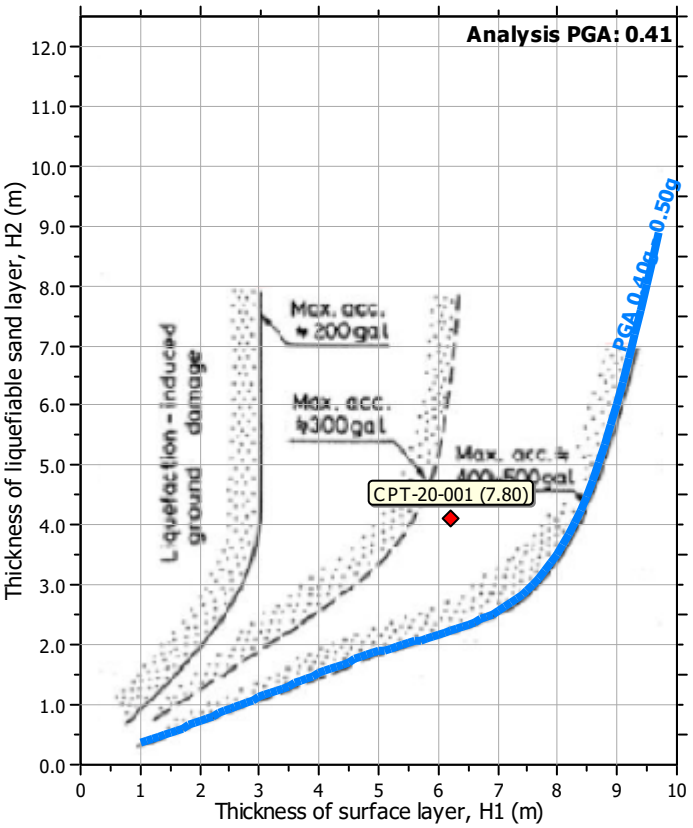
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



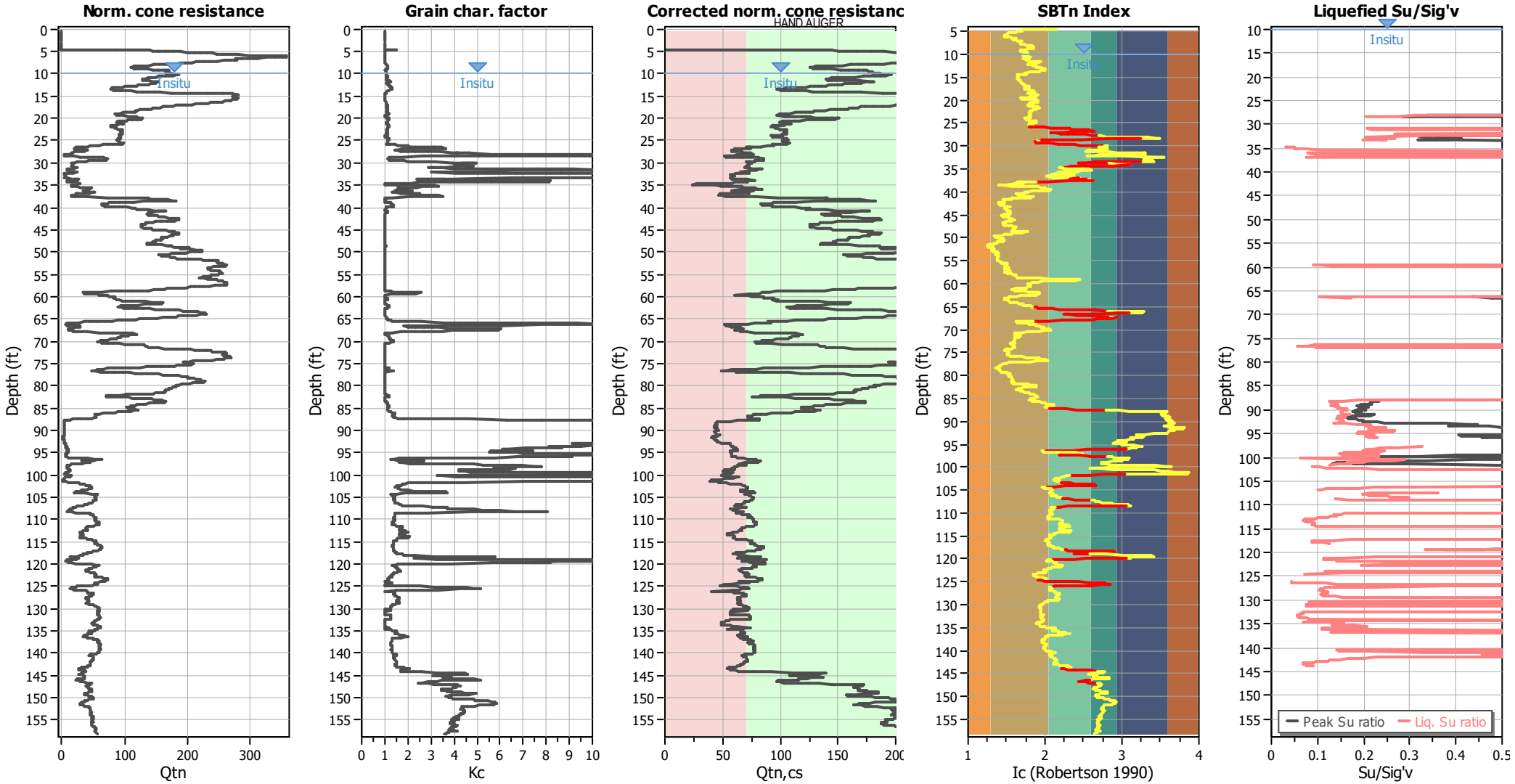




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

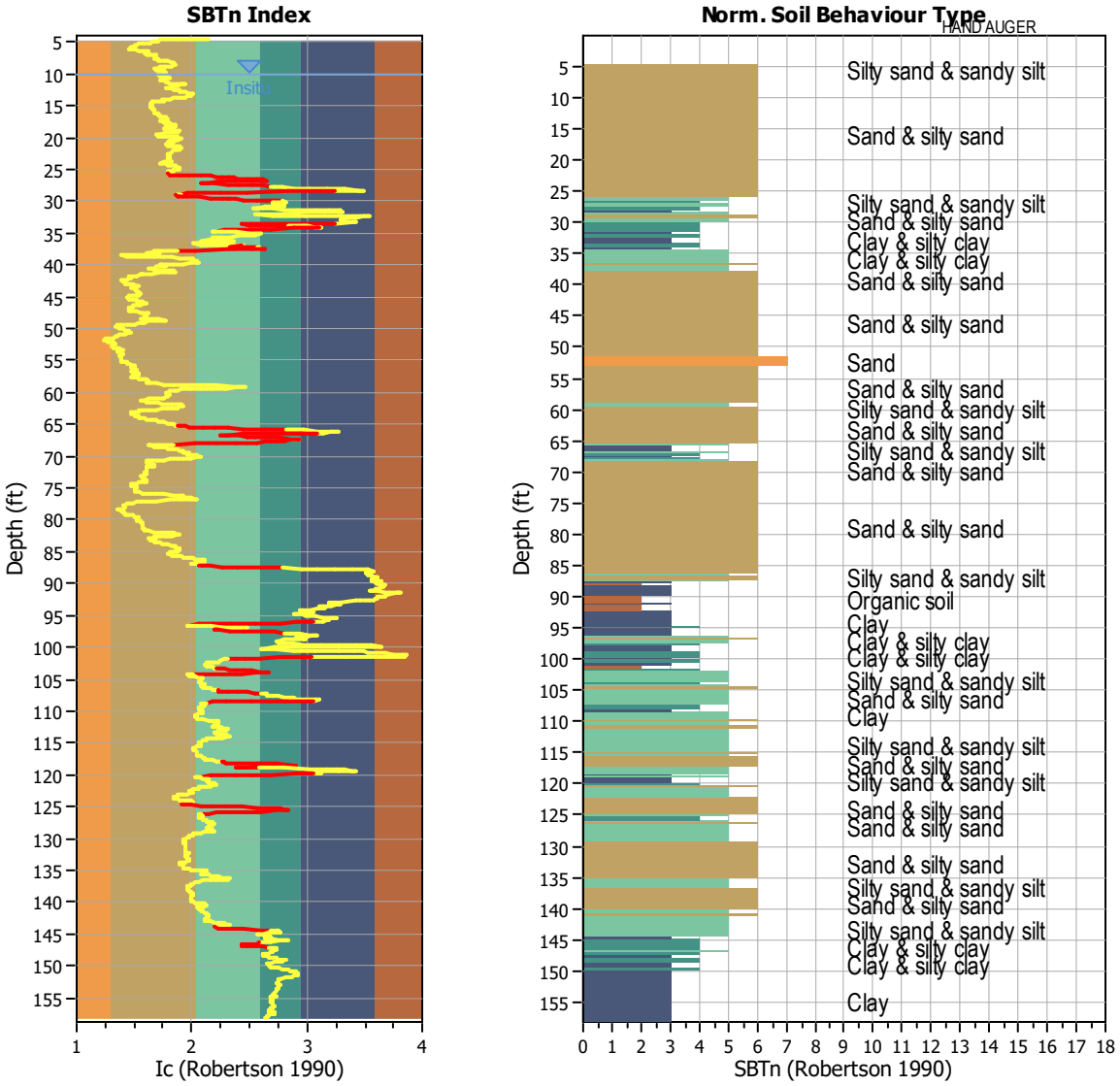
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

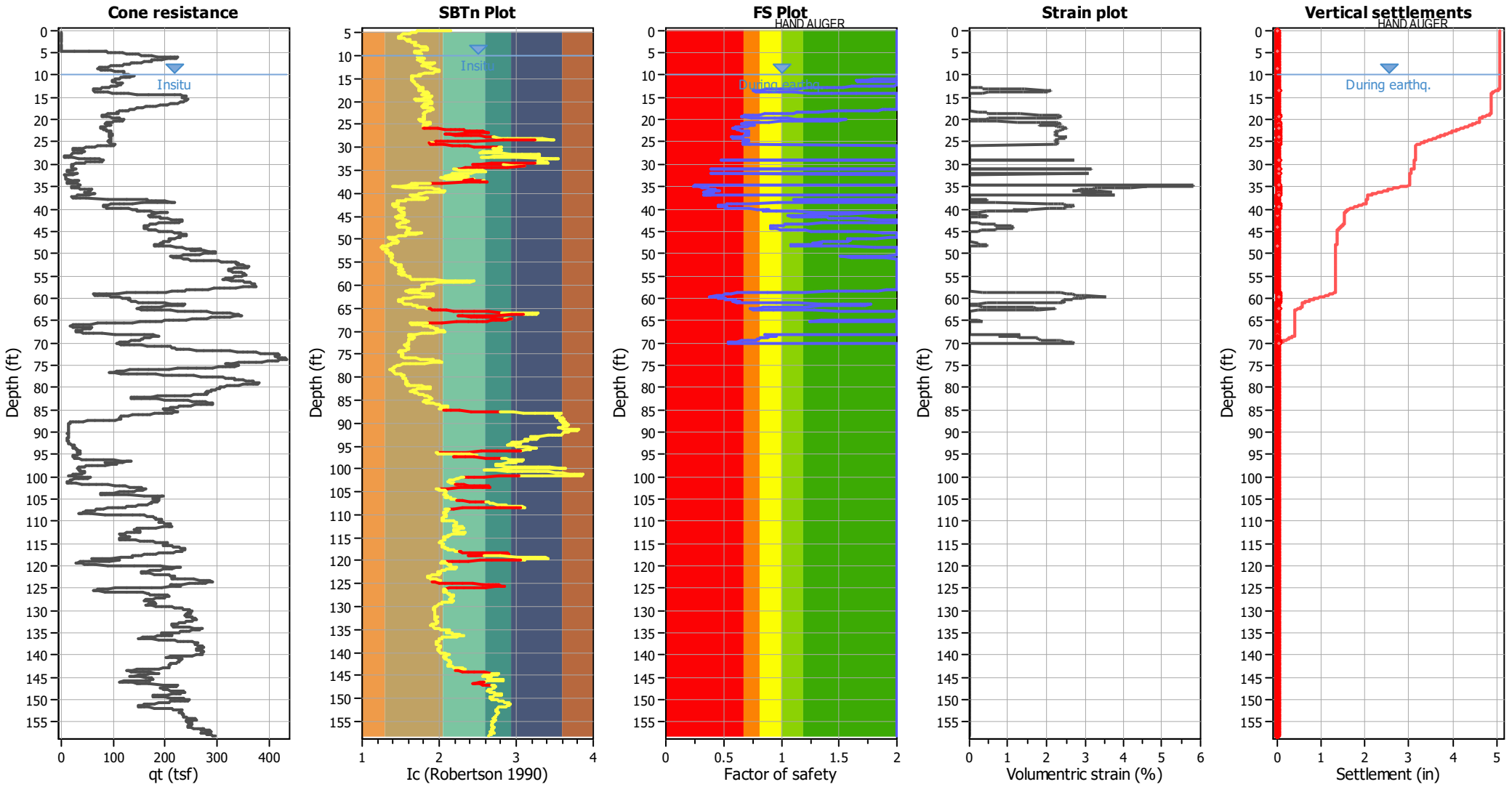
The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties		General statistics	
I_c minimum check value:	1.70	Total points in CPT file:	2411
I_c maximum check value:	3.00	Total points excluded:	254
I_c change ratio value:	0.0250	Exclusion percentage:	10.54%
Minimum number of points in layer:	4	Number of layers detected:	31

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

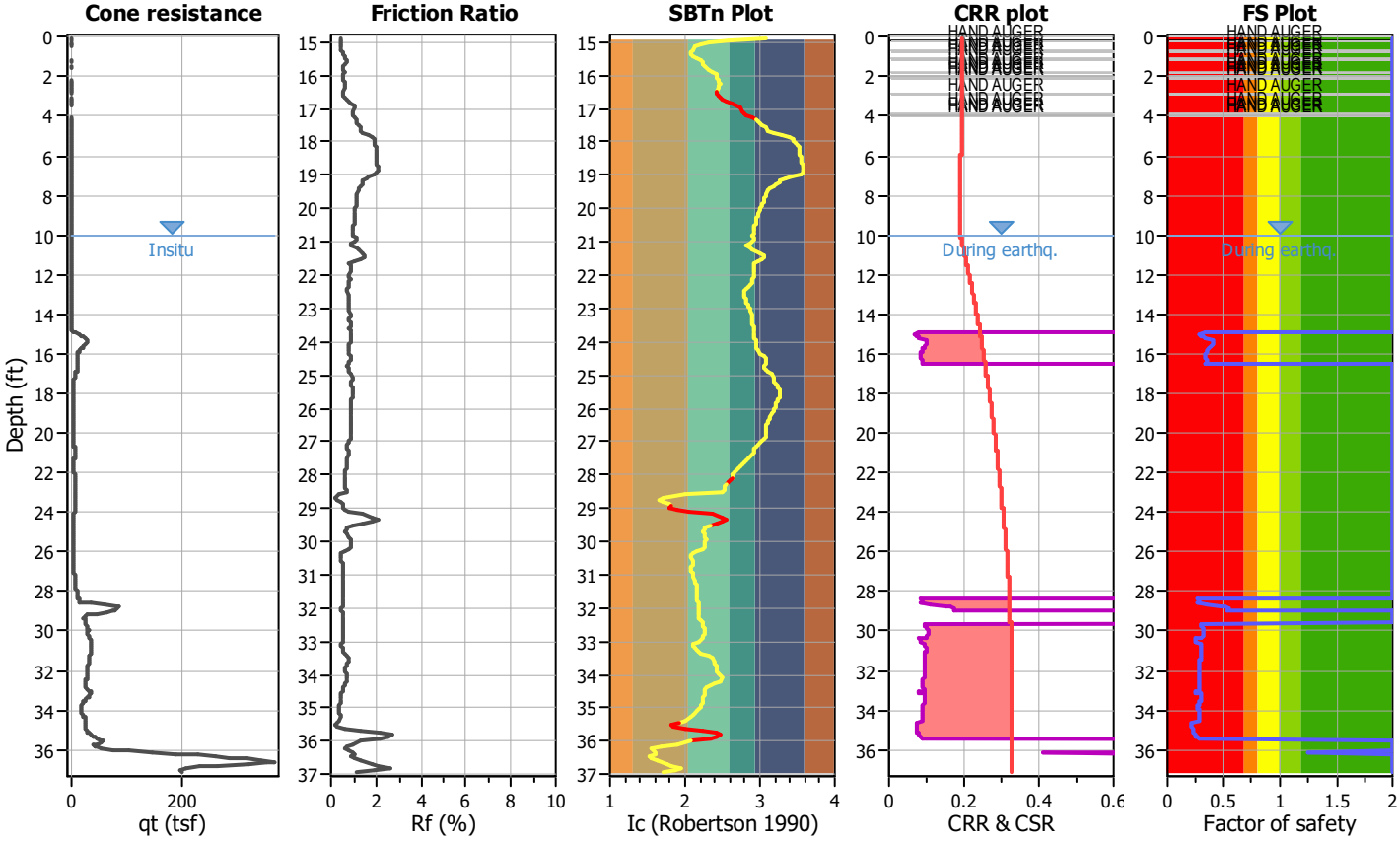
LIQUEFACTION ANALYSIS REPORT

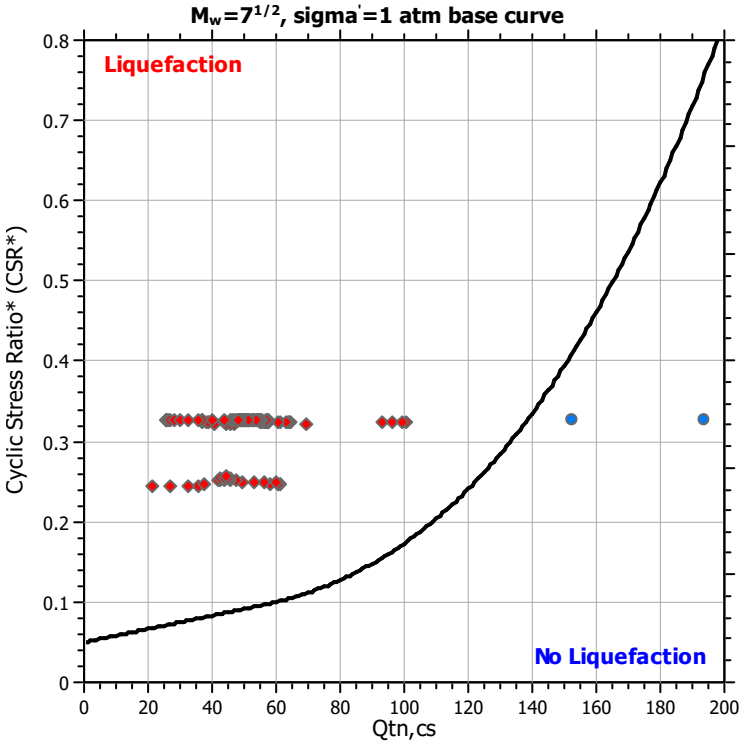
Project title : Camino Del Mar Bridge Replacement **Location : Del Mar, CA**

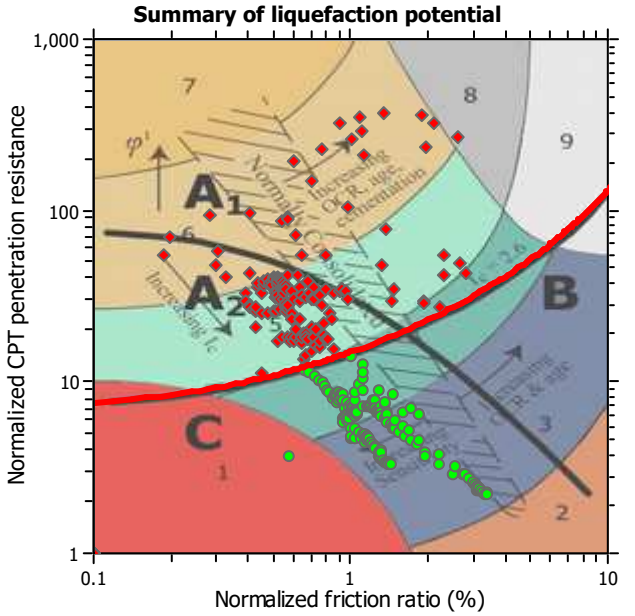
CPT file : CPT-20-002A

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	70.00 ft
Earthquake magnitude M_w:	6.63	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.41	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

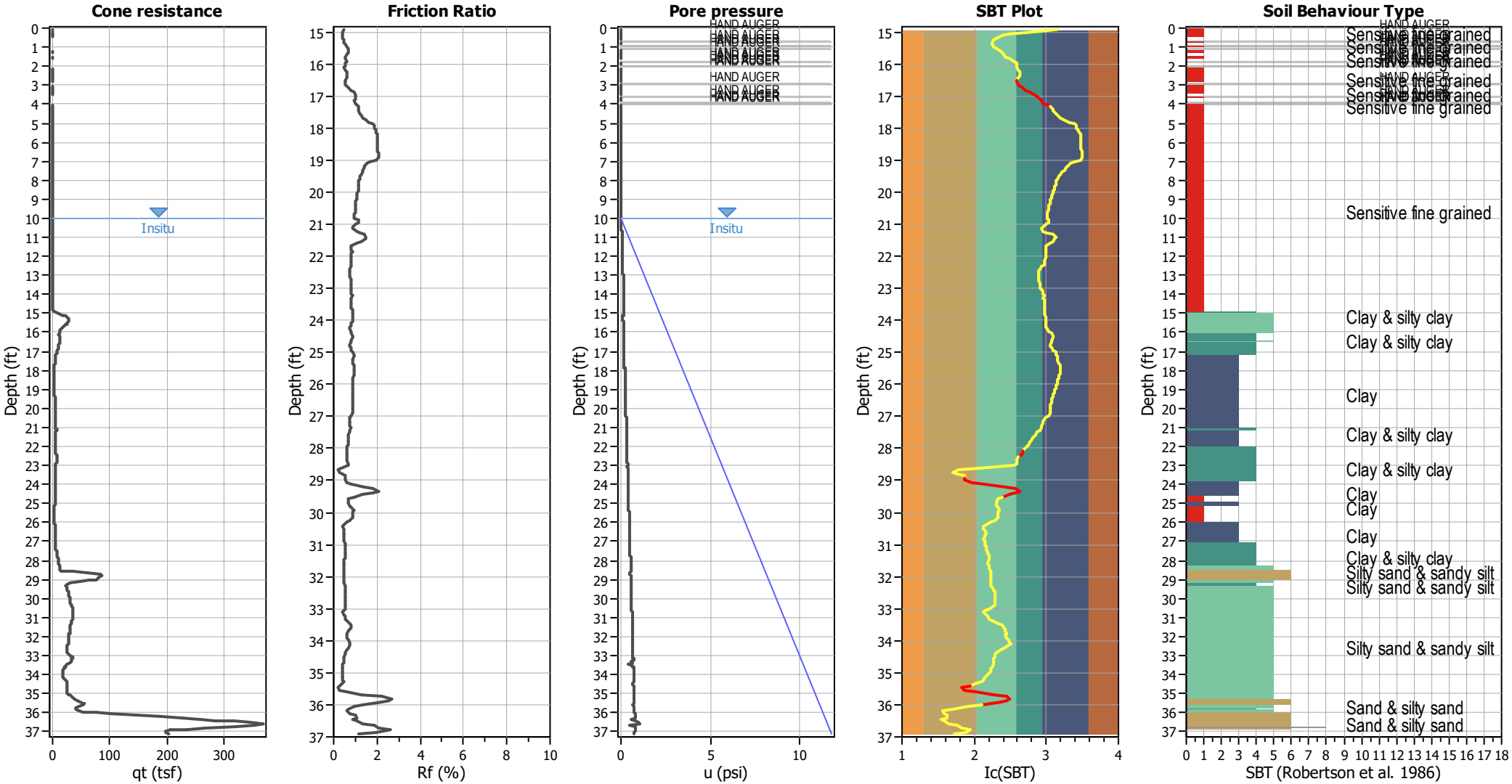






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



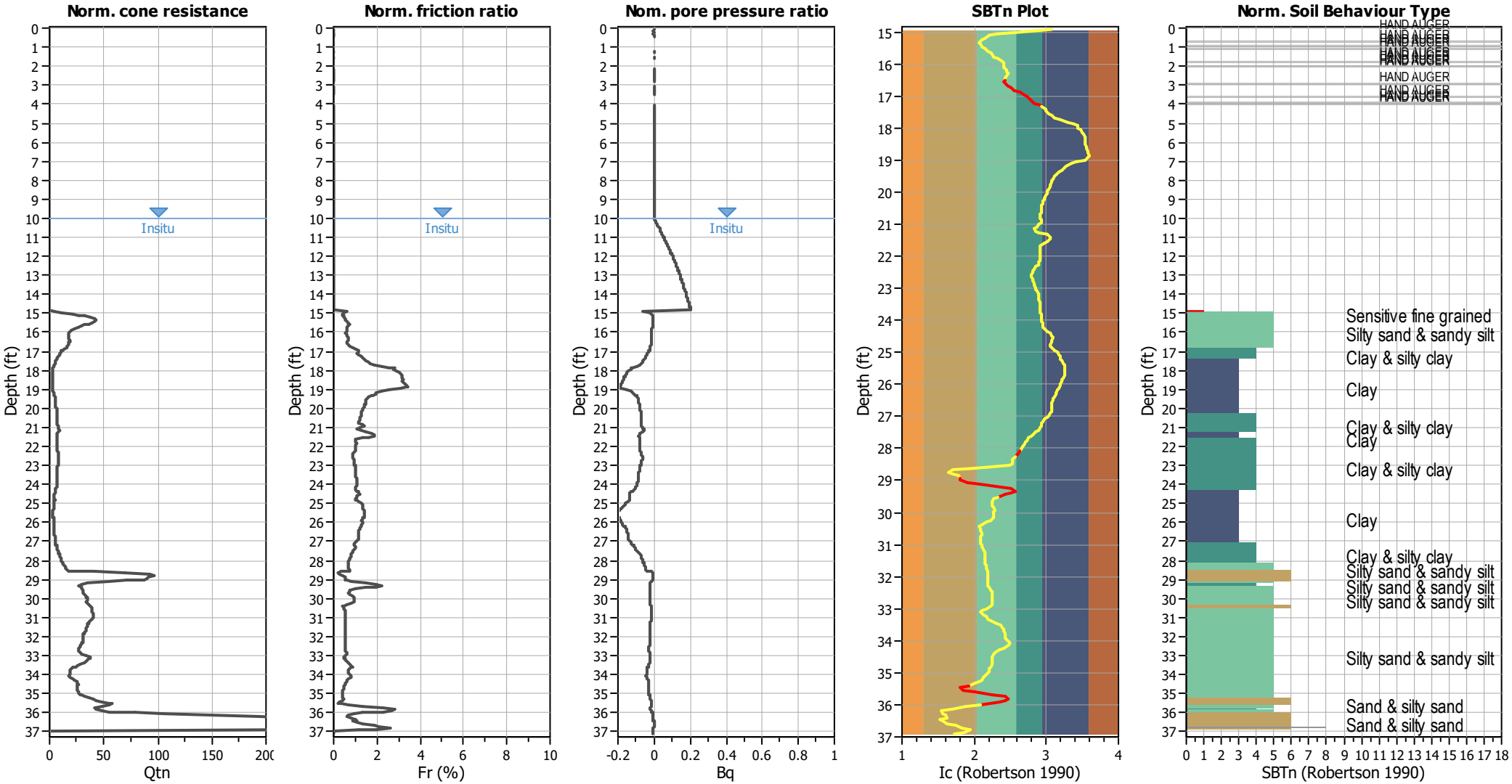
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



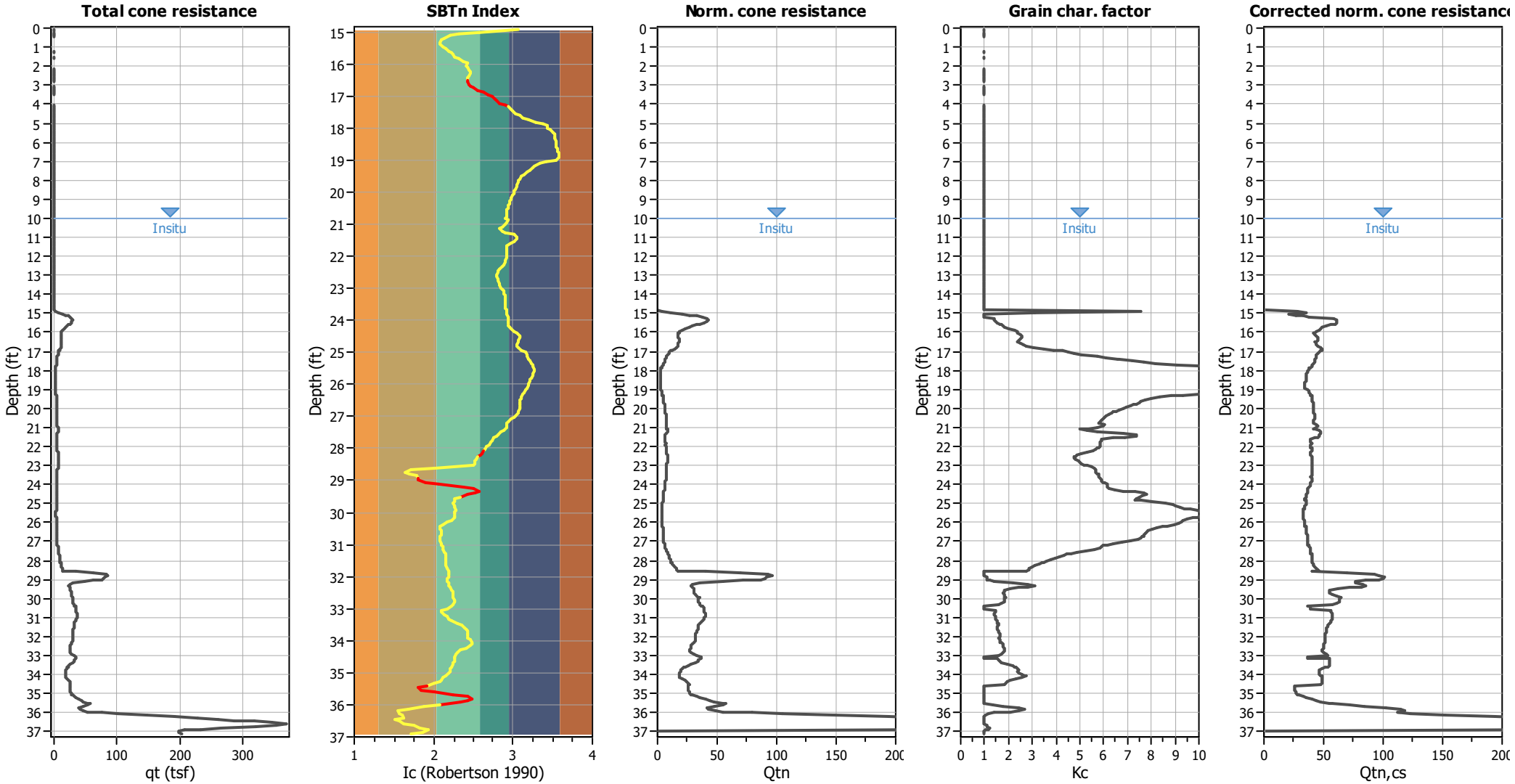
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

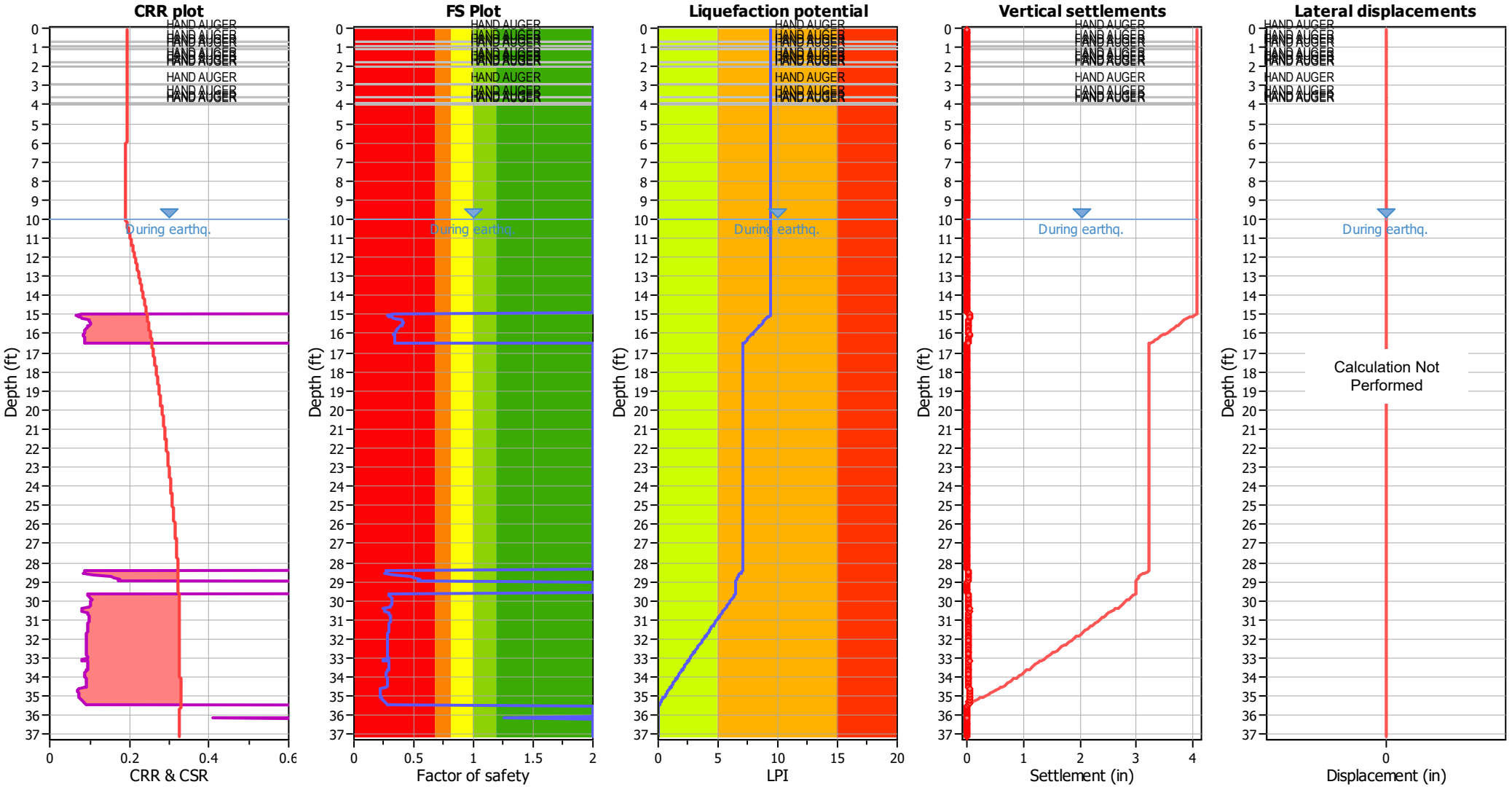
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

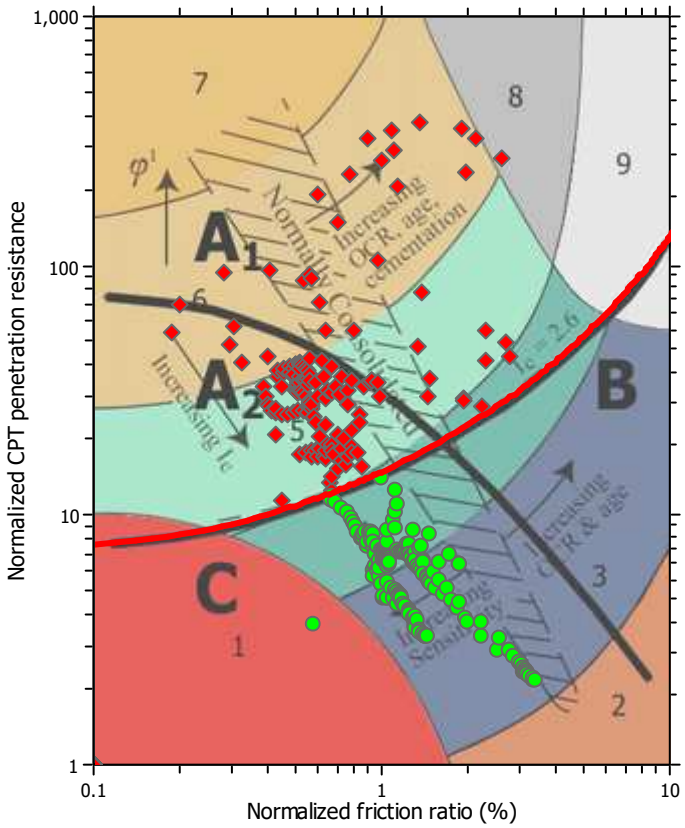
F.S. color scheme

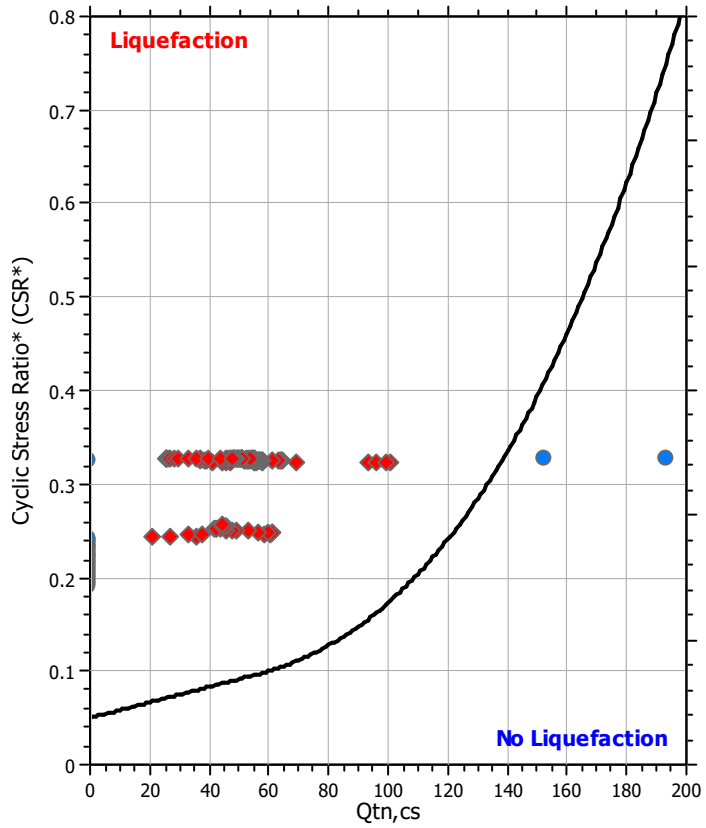
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

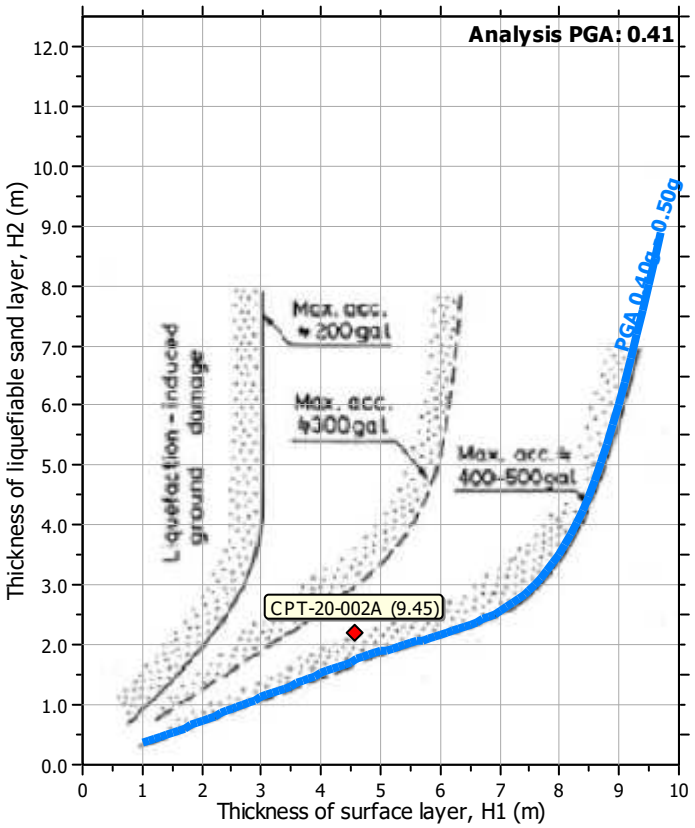
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



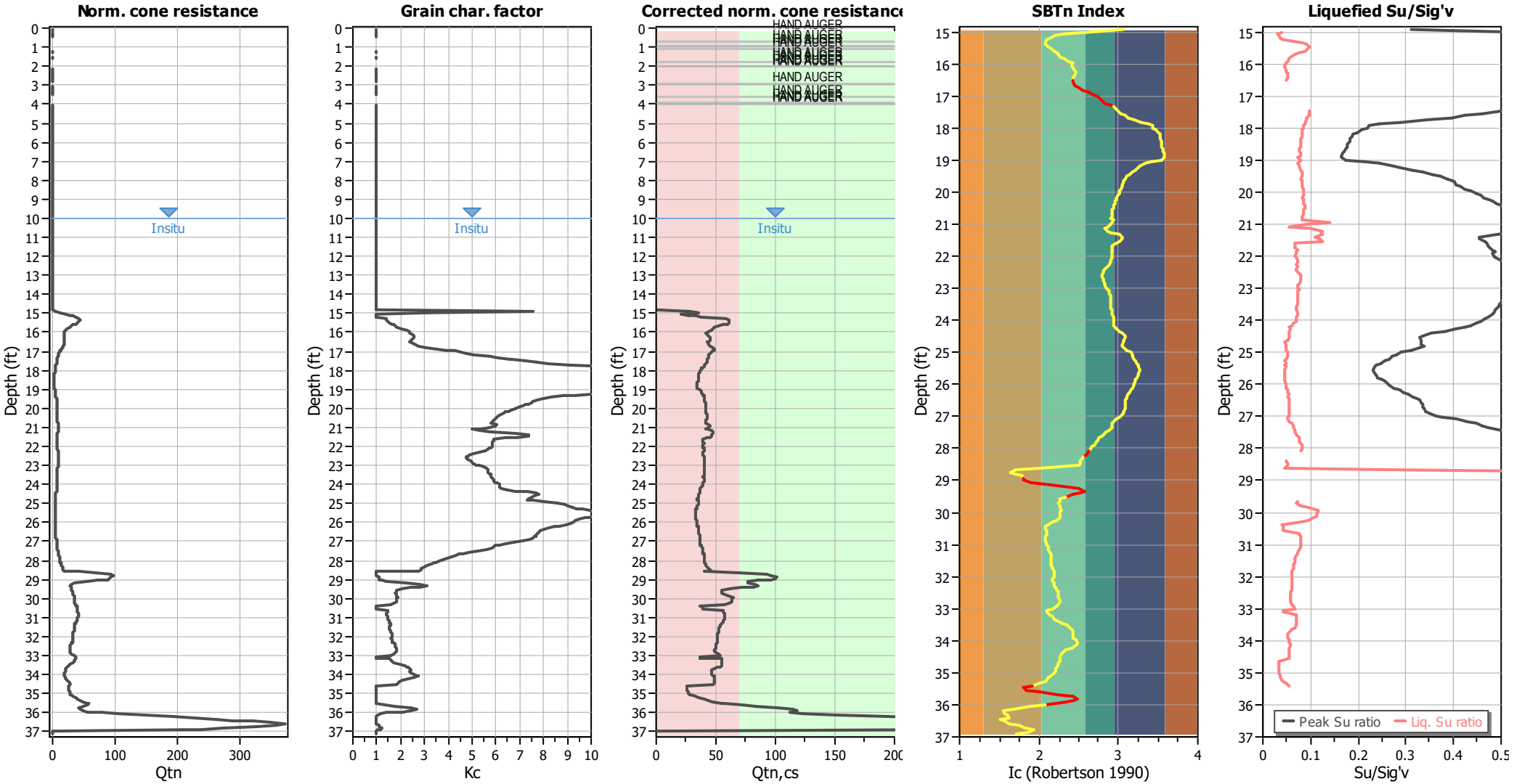




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

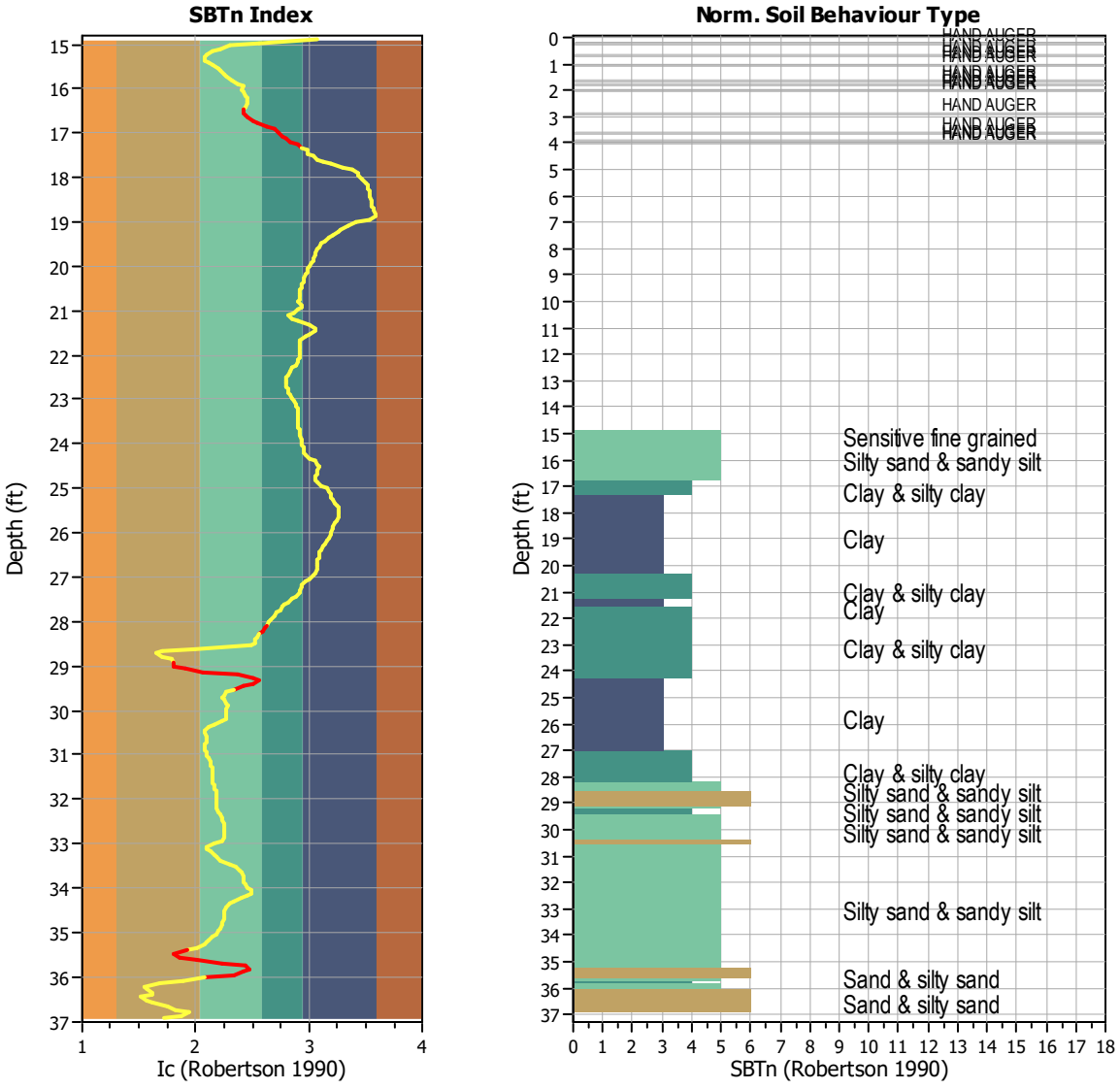
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

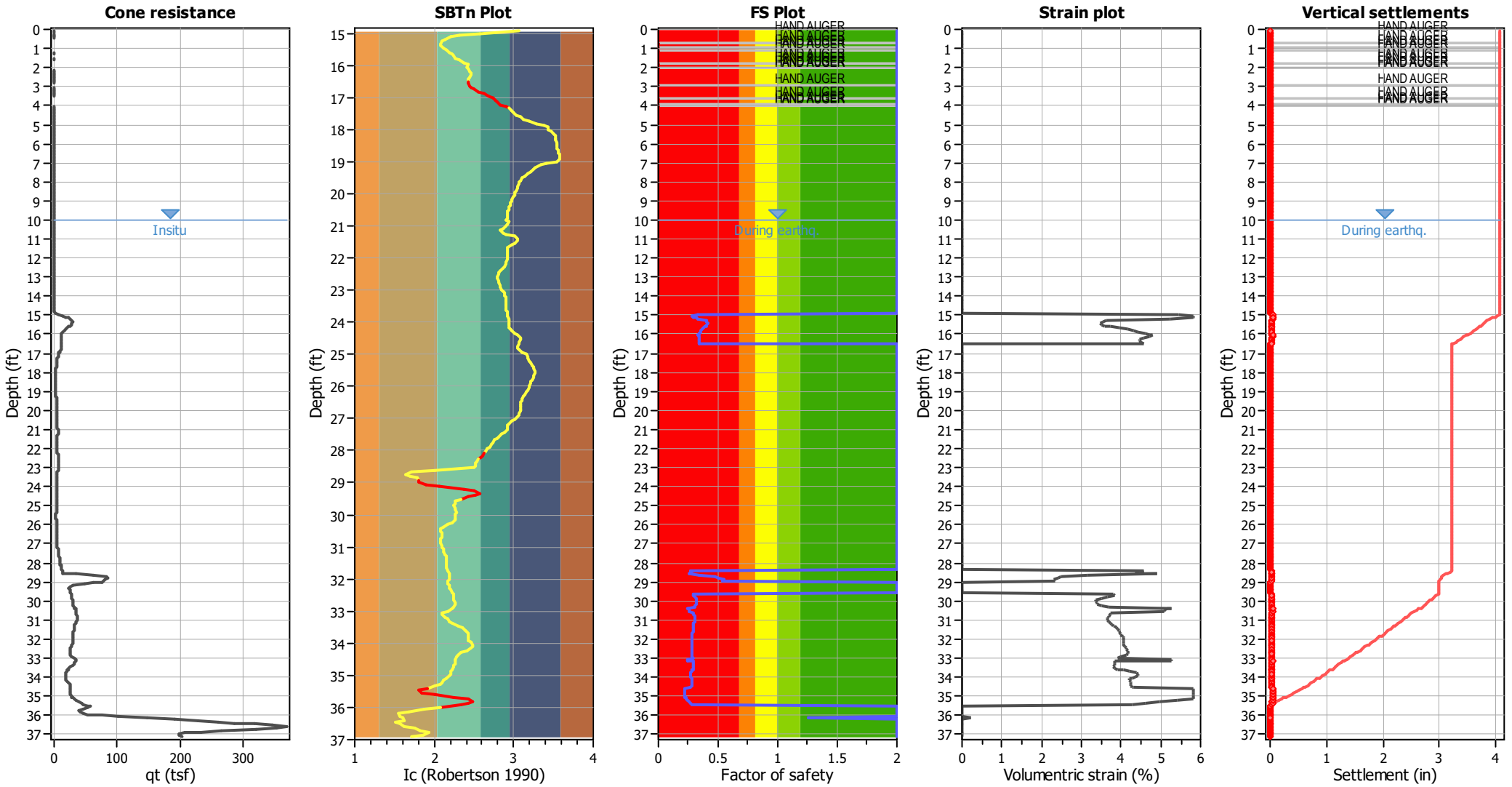
The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties		General statistics	
I_c minimum check value:	1.70	Total points in CPT file:	566
I_c maximum check value:	3.00	Total points excluded:	40
I_c change ratio value:	0.0250	Exclusion percentage:	7.07%
Minimum number of points in layer:	4	Number of layers detected:	6

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

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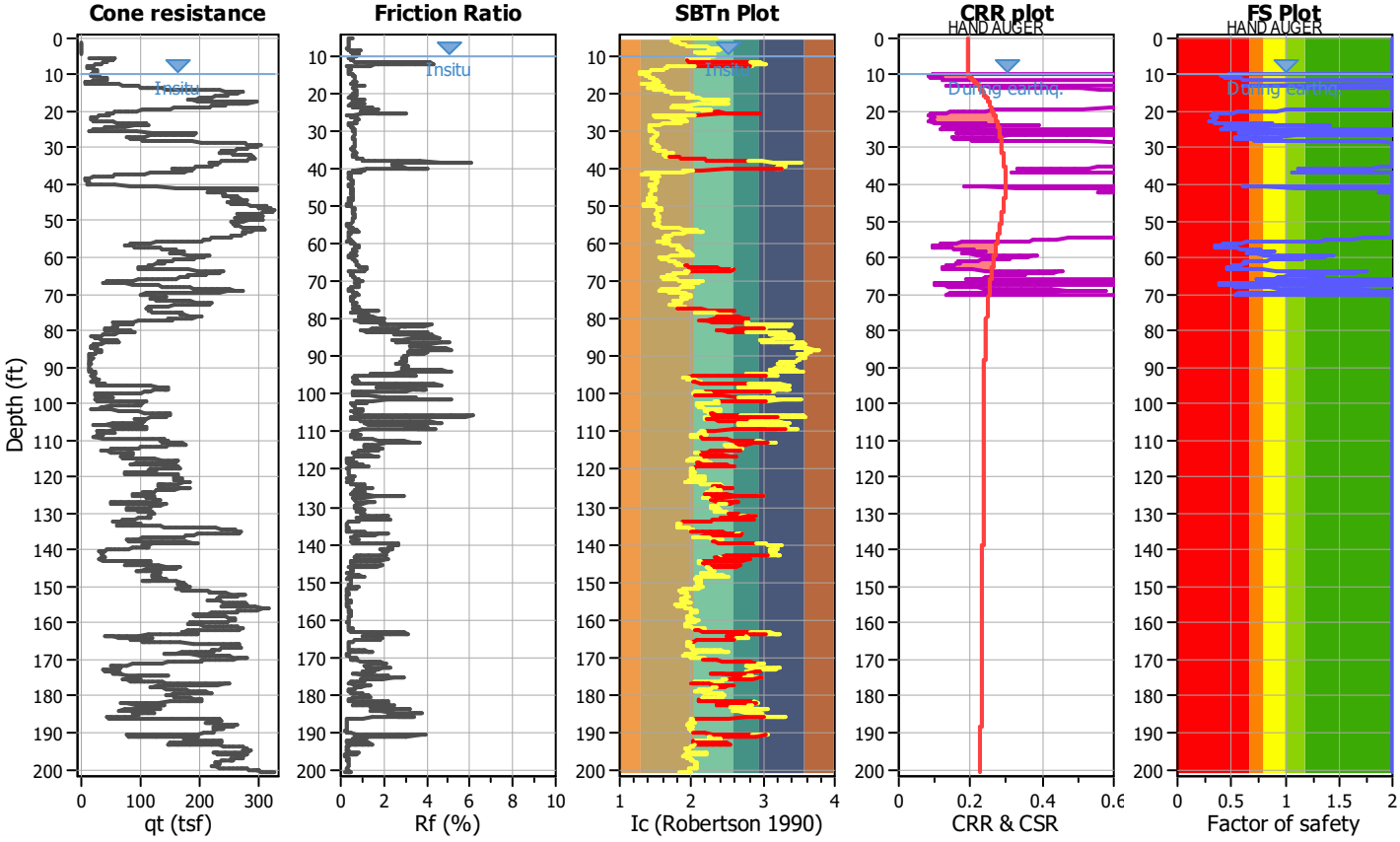
LIQUEFACTION ANALYSIS REPORT

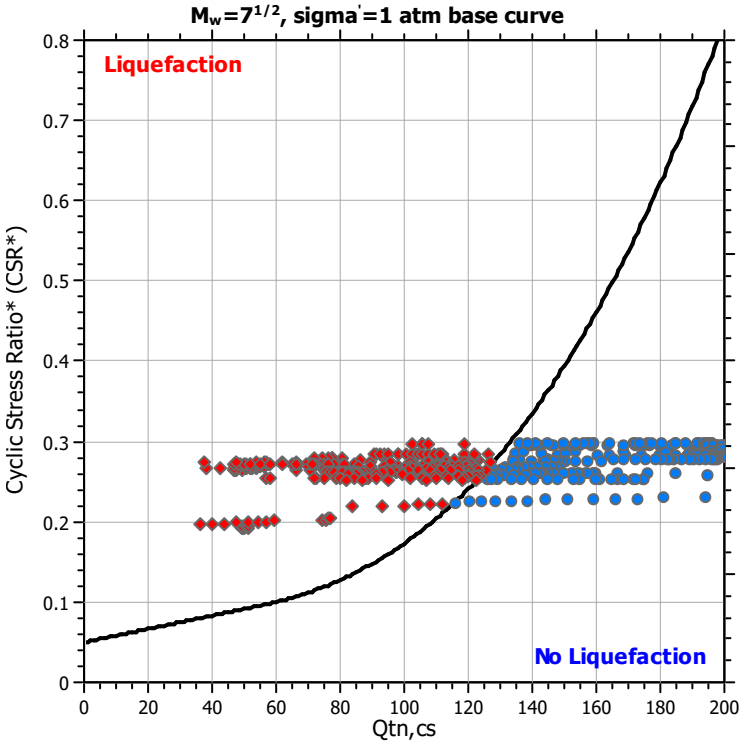
Project title : Camino Del Mar Bridge Replacement **Location : Del Mar, CA**

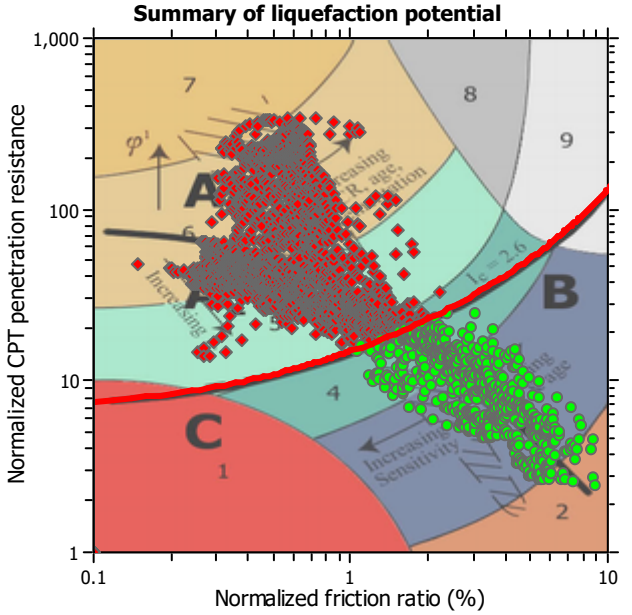
CPT file : CPT-20-003

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	70.00 ft
Earthquake magnitude M_w:	6.63	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.41	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

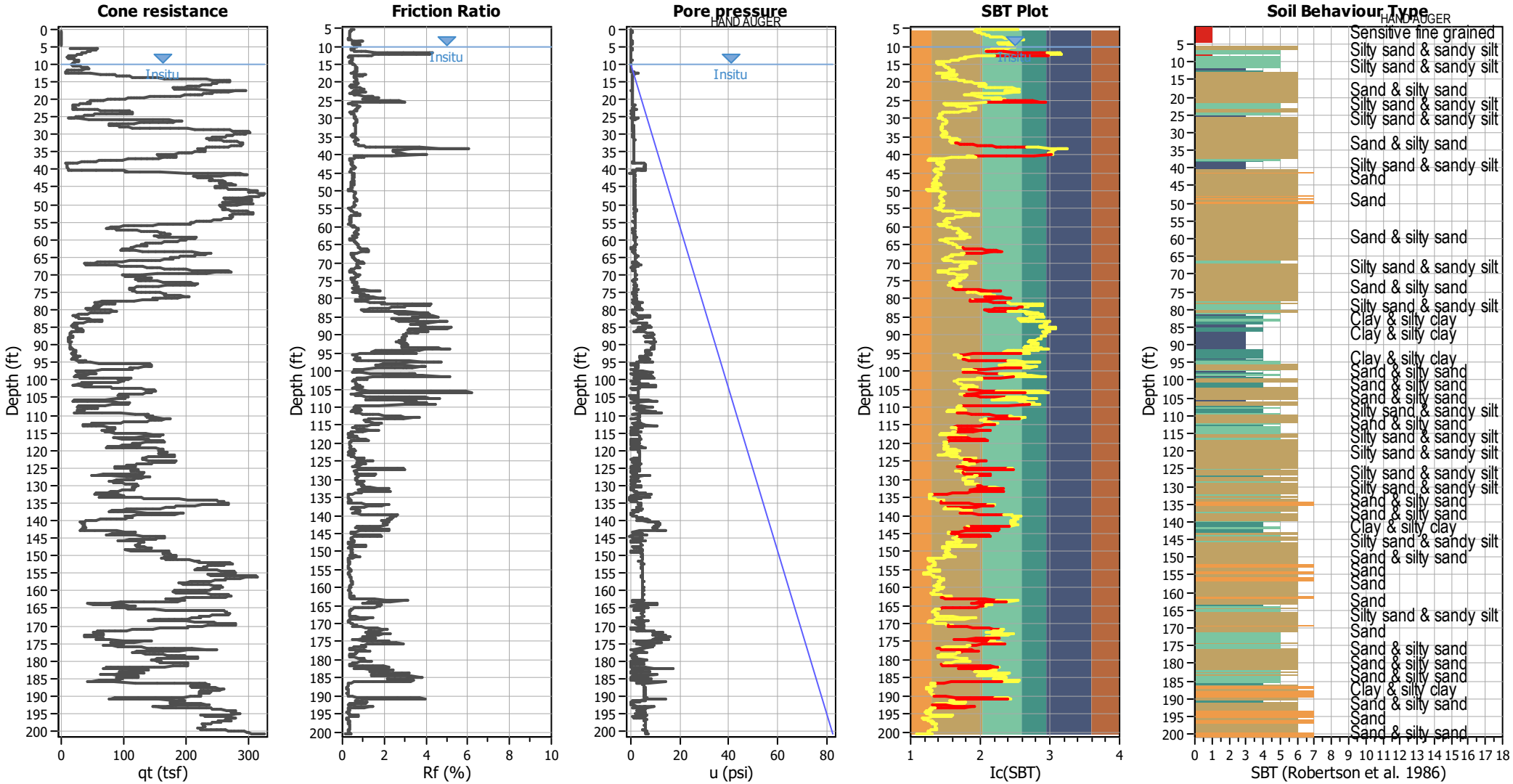






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



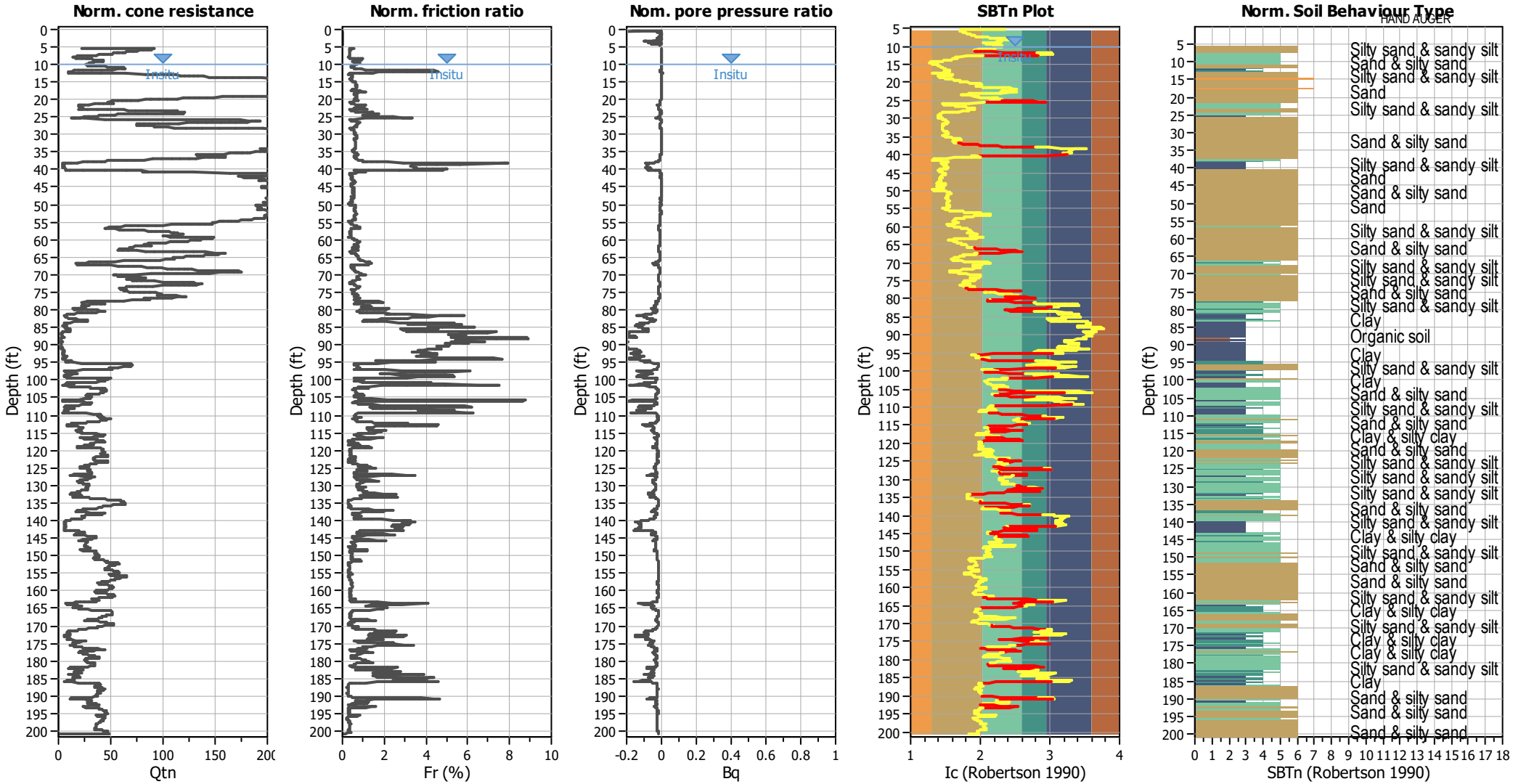
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



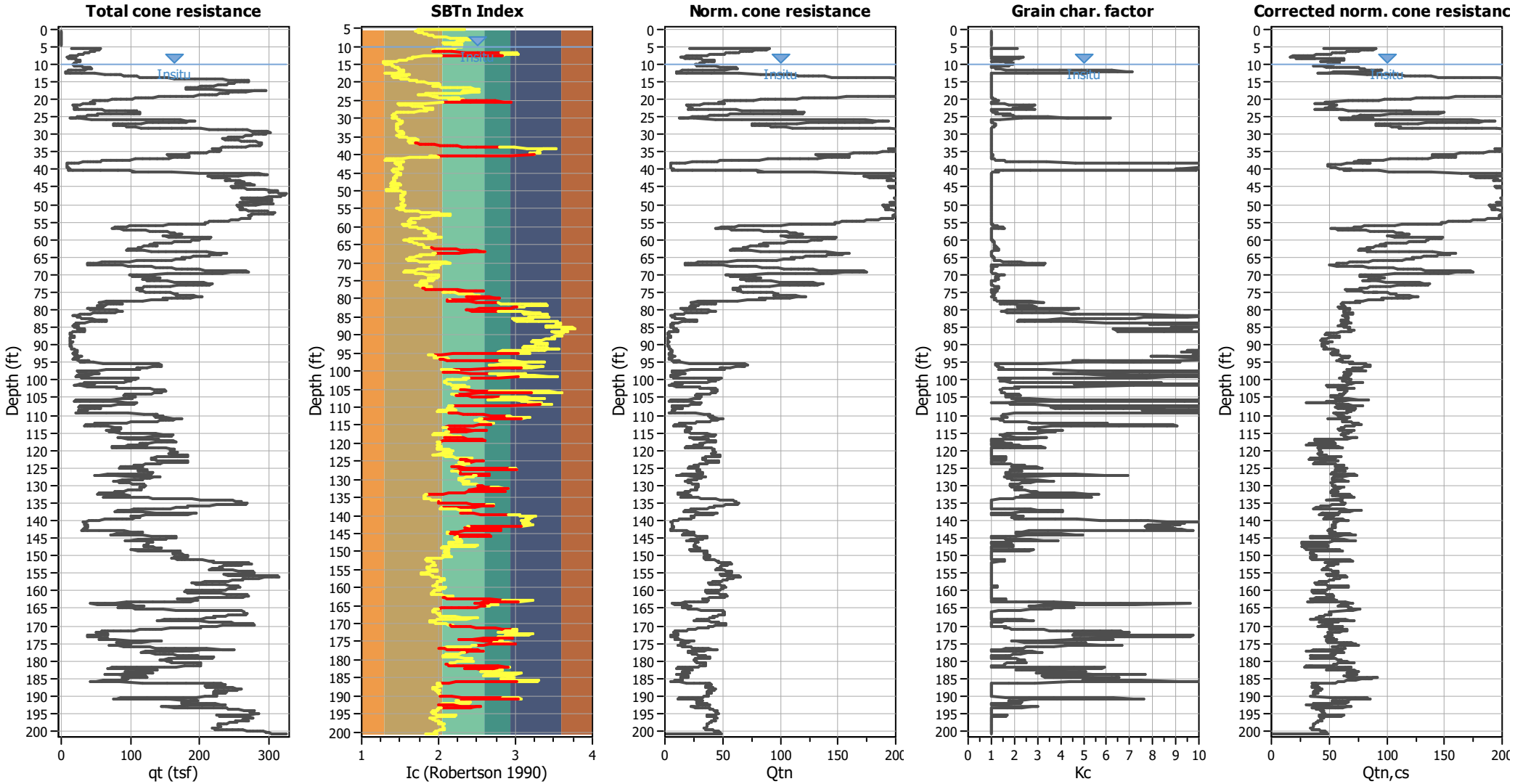
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

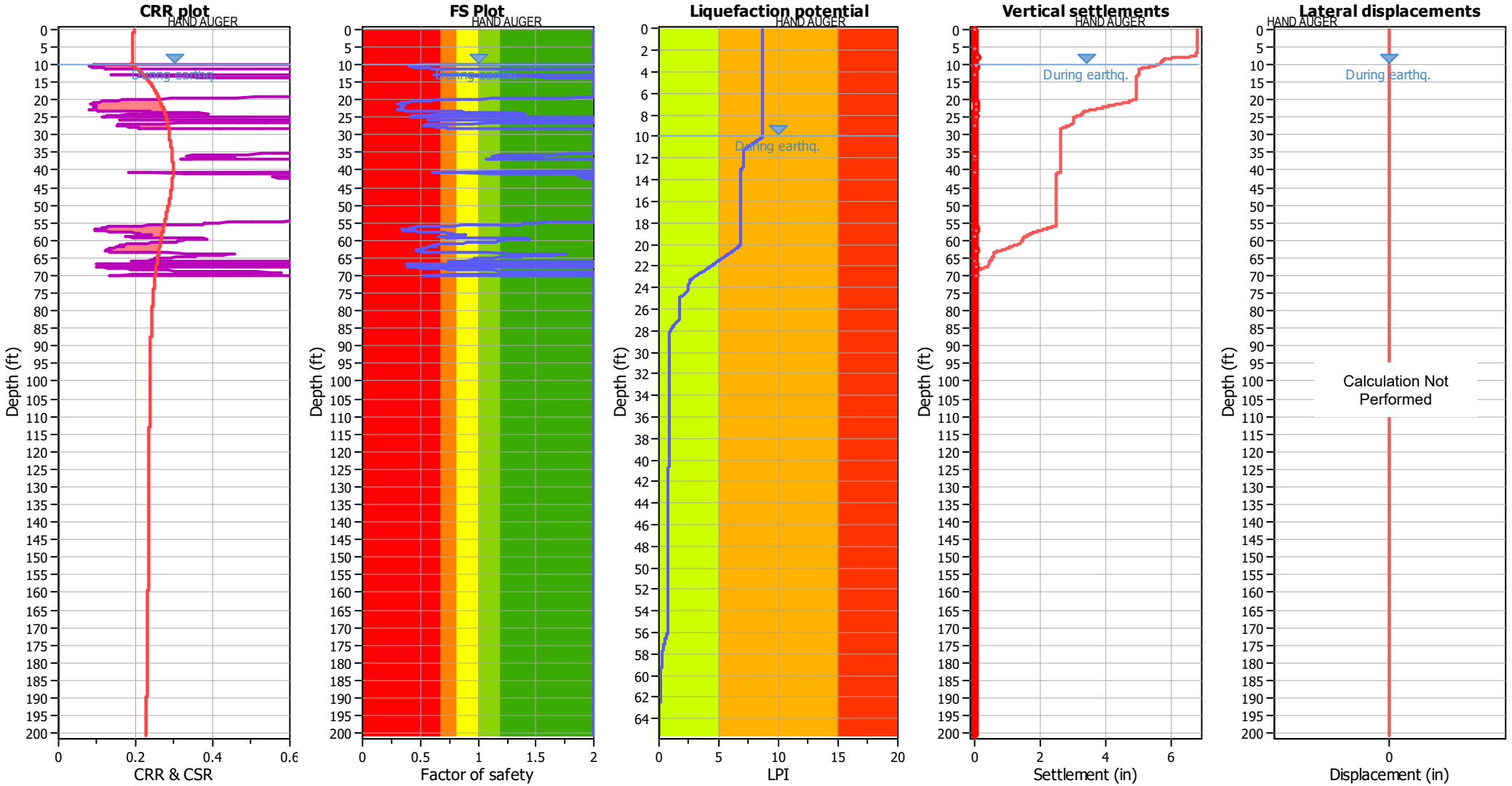
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

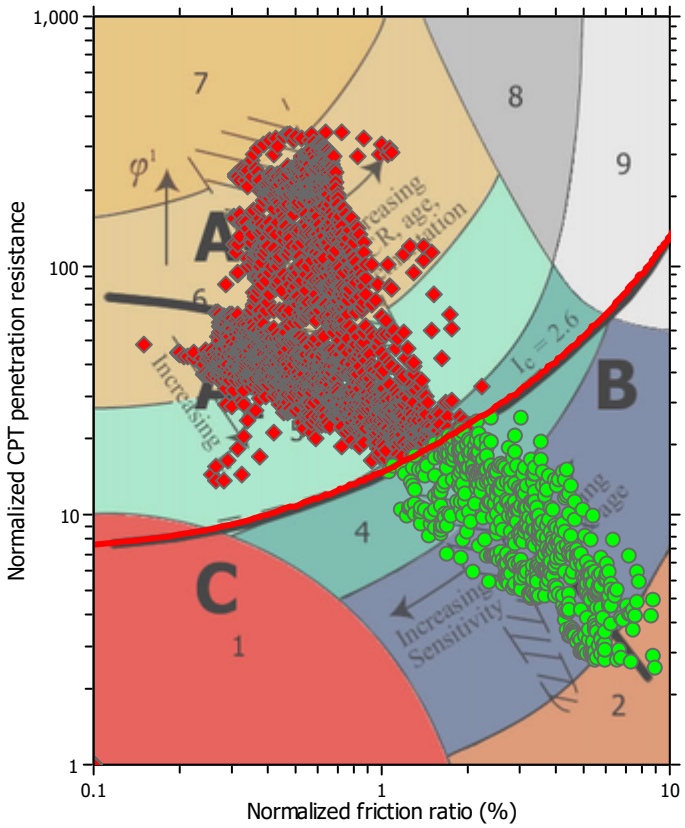
F.S. color scheme

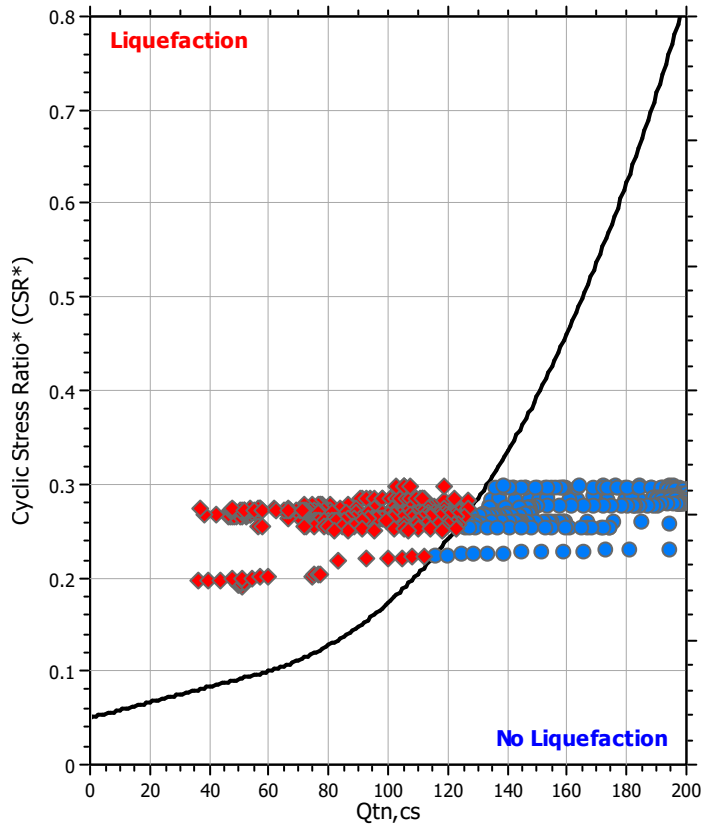
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

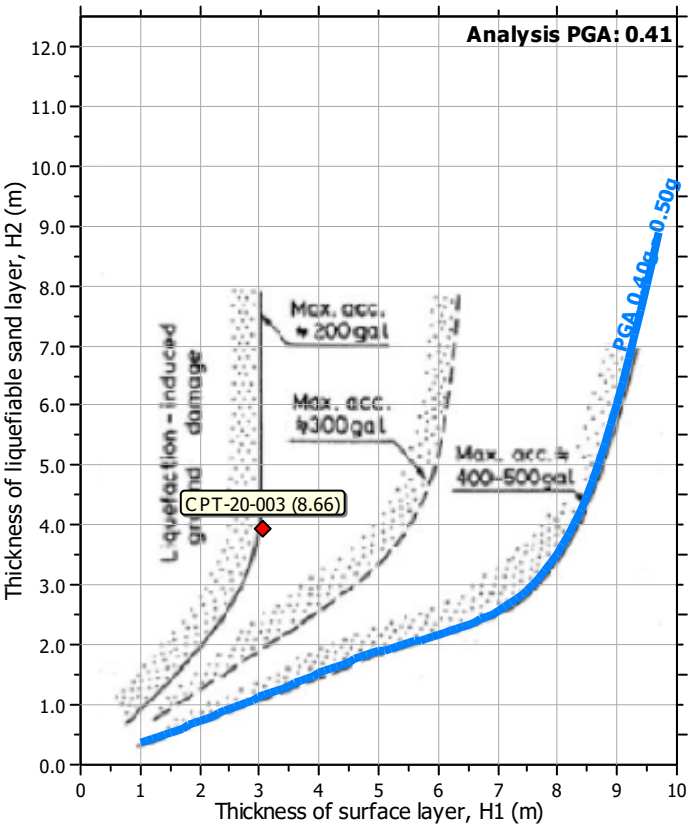
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



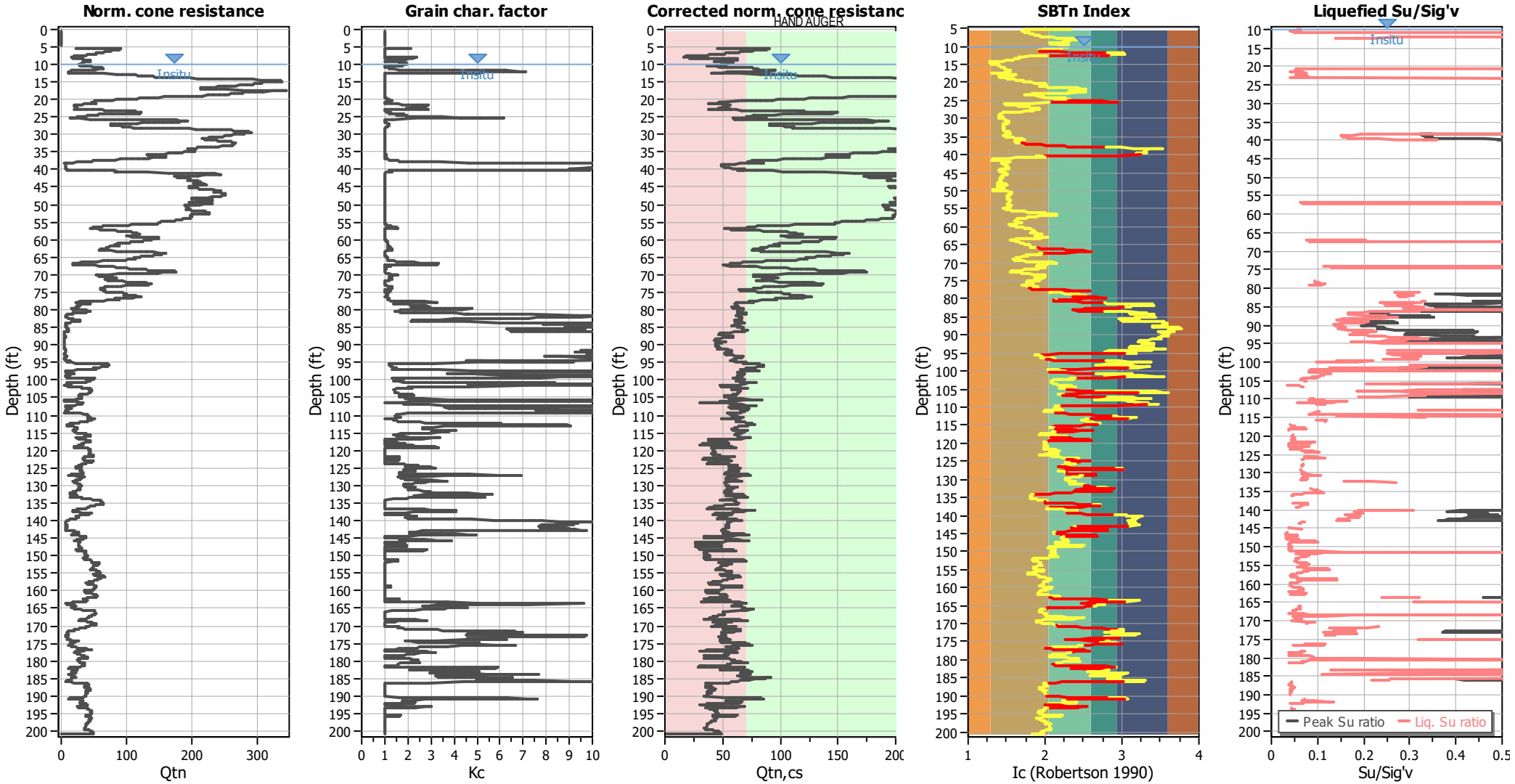




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

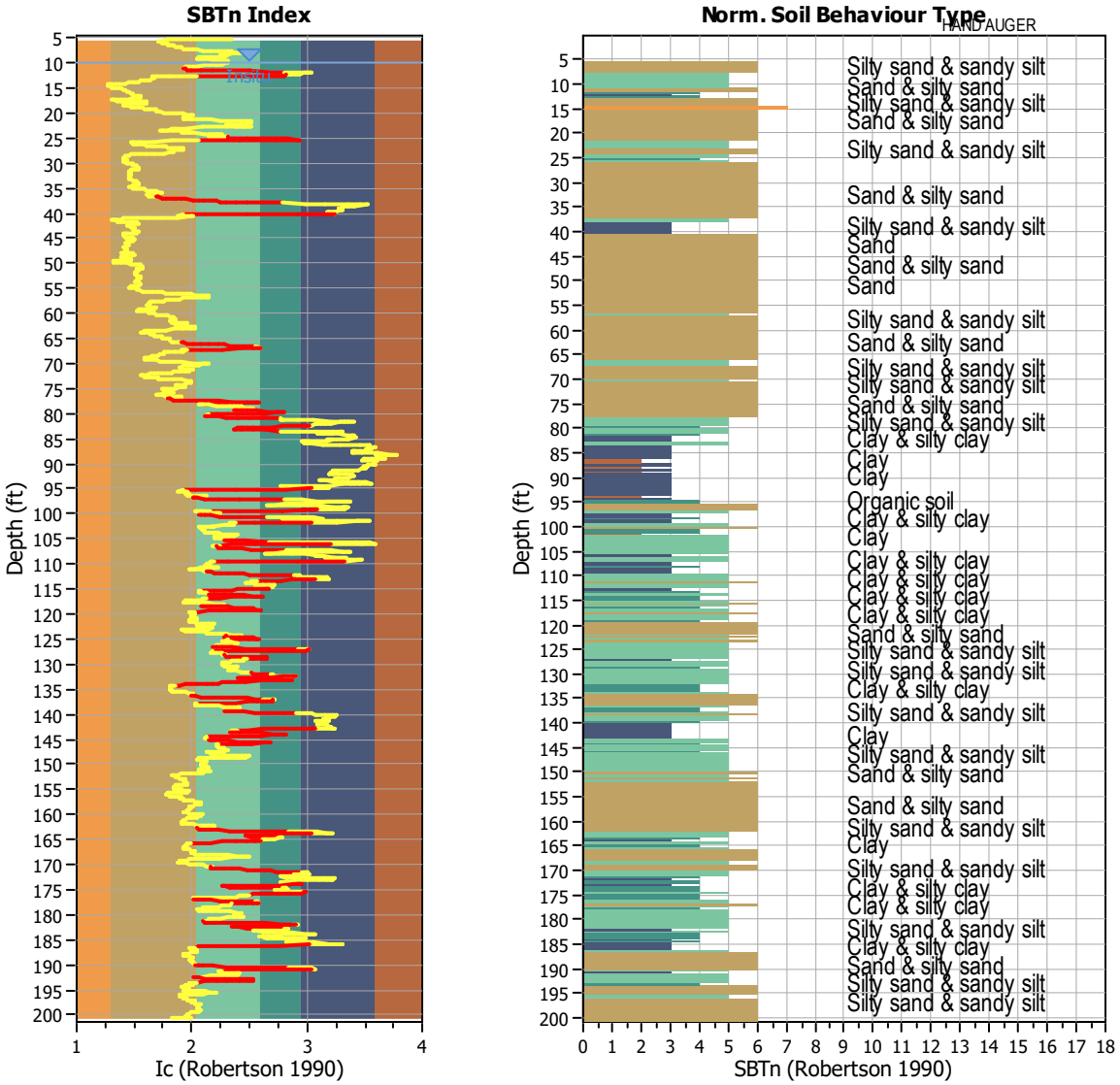
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

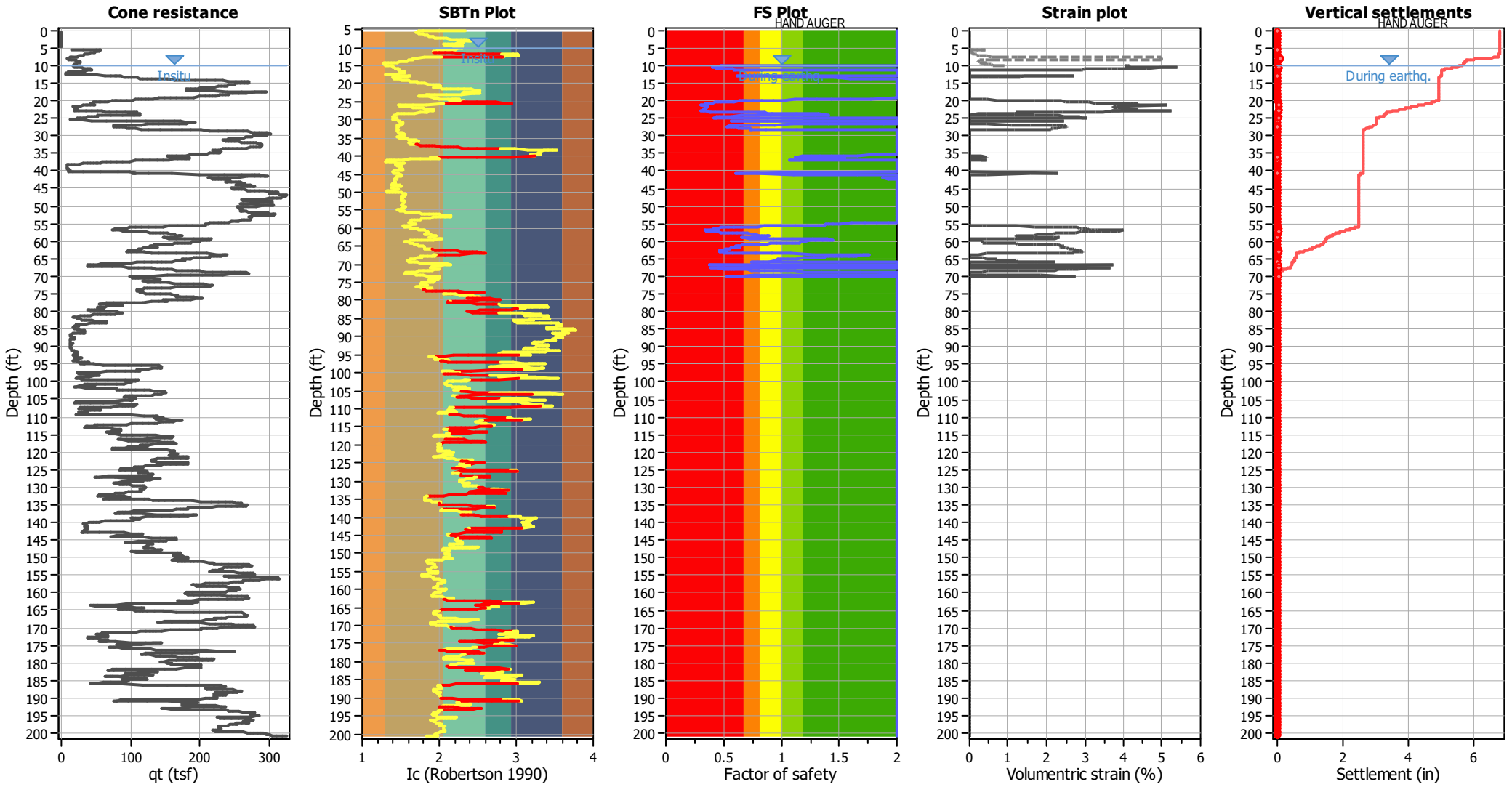
The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties		General statistics	
I_c minimum check value:	1.70	Total points in CPT file:	3061
I_c maximum check value:	3.00	Total points excluded:	554
I_c change ratio value:	0.0250	Exclusion percentage:	18.10%
Minimum number of points in layer:	4	Number of layers detected:	67

Estimation of post-earthquake settlements

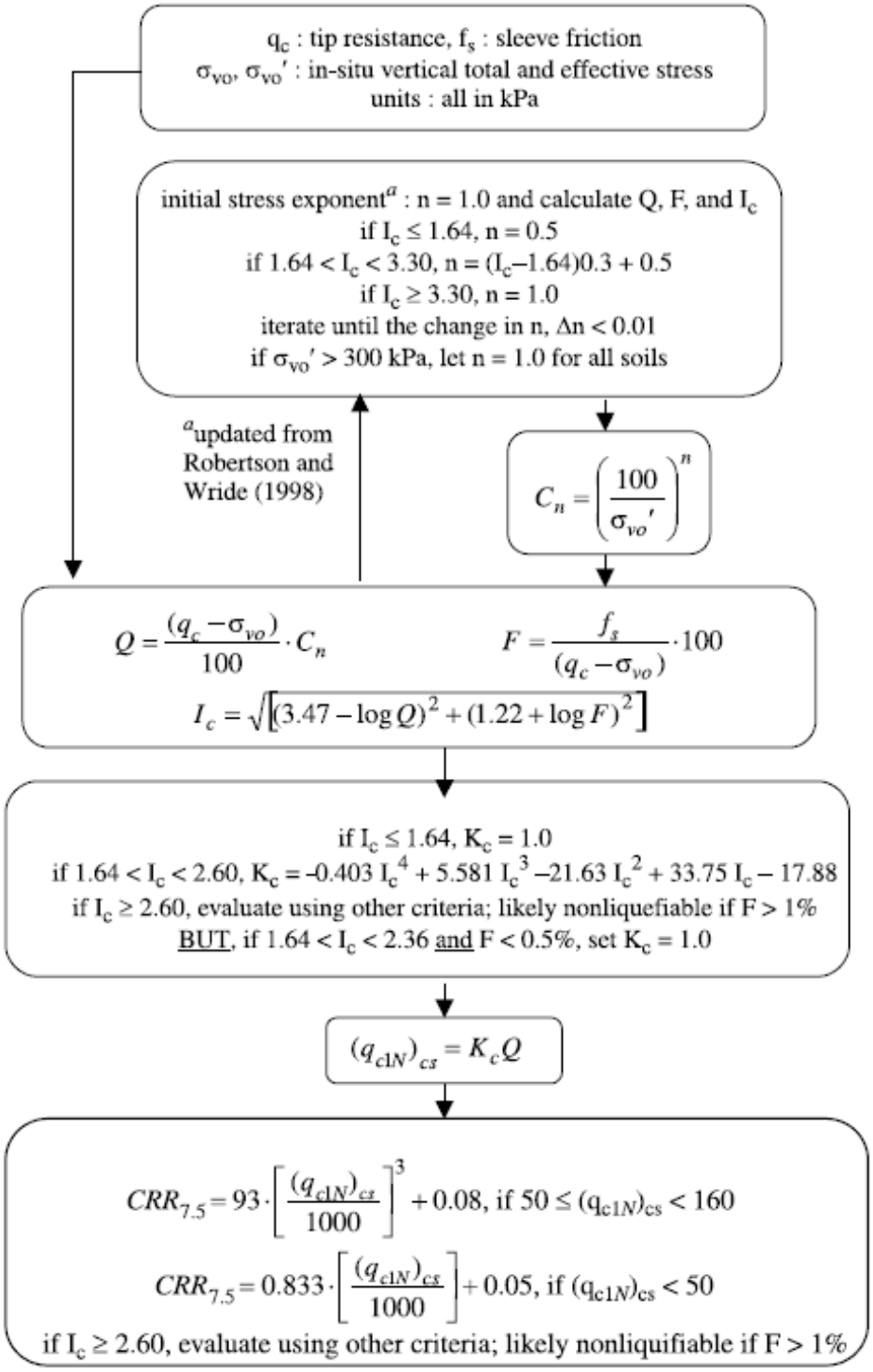


Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

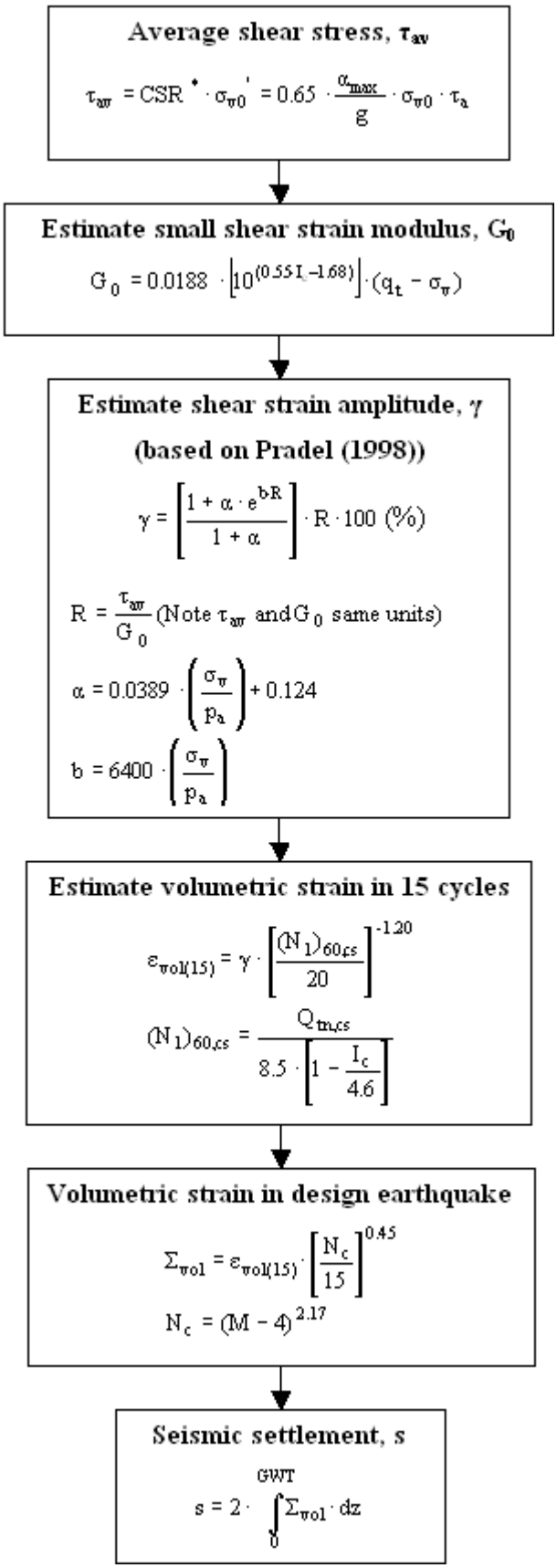
Procedure for the evaluation of soil liquefaction resistance, NCEER (1998)

Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. The procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:



[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

Procedure for the estimation of seismic induced settlements in dry sands



Robertson, P.K. and Lisheng, S., 2010, "Estimation of seismic compression in dry soils using the CPT" FIFTH INTERNATIONAL CONFERENCE ON RECENT ADVANCES IN GEOTECHNICAL EARTHQUAKE ENGINEERING AND SOIL DYNAMICS, Symposium in honor of professor I. M. Idriss, San Diego, CA

Liquefaction Potential Index (LPI) calculation procedure

Calculation of the Liquefaction Potential Index (LPI) is used to interpret the liquefaction assessment calculations in terms of severity over depth. The calculation procedure is based on the methology developed by Iwasaki (1982) and is adopted by AFPS.

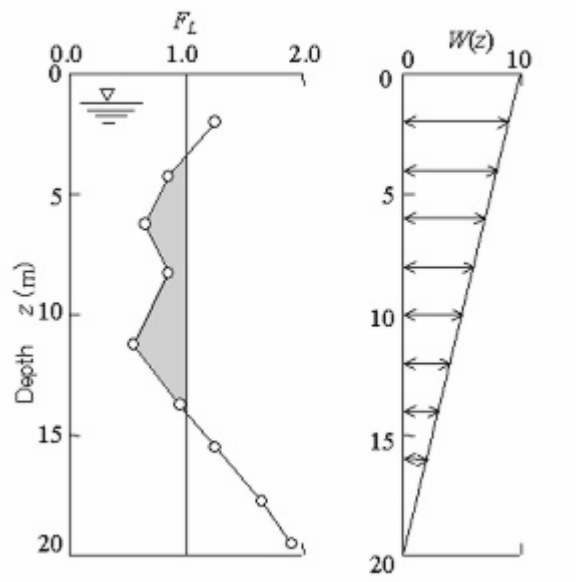
To estimate the severity of liquefaction extent at a given site, LPI is calculated based on the following equation:

$$\mathbf{LPI} = \int_0^{20} (10 - 0{,}5z) \times F_L \times dz$$

where:
F_L = 1 - F.S. when F.S. less than 1
F_L = 0 when F.S. greater than 1
z depth of measurment in meters

Values of LPI range between zero (0) when no test point is characterized as liquefiable and 100 when all points are characterized as susceptible to liquefaction. Iwasaki proposed four (4) discrete categories based on the numeric value of LPI:

- LPI = 0 : Liquefaction risk is very low
- 0 < LPI <= 5 : Liquefaction risk is low
- 5 < LPI <= 15 : Liquefaction risk is high
- LPI > 15 : Liquefaction risk is very high



Graphical presentation of the LPI calculation procedure

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APPENDIX H
GEOTECHNICAL BUSINESS COUNCIL INSERT

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Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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Appendix E

Preliminary Foundation Report

June 19, 2020
Kleinfelder Project No. 20180876.001A

Mr. Tim Thiele, PE, QSD
City Engineer | Michael Baker International
City of Del Mar
1050 Camino Del Mar
Del Mar, California 92014

SUBJECT: Preliminary Foundation Report
Camino Del Mar Bridge Replacement
Over San Dieguito River
Del Mar, California

Dear Mr. Thiele:

Kleinfelder is pleased to present this Preliminary Foundation Report (PFR) for the Camino Del Mar Bridge Replacement over San Dieguito River located in Del Mar, California. This report includes preliminary foundation recommendations for the proposed replacement bridge and includes evaluations of the associated improvements such as approach fills and retaining walls for the construction of the project. This report is presented in conjunction with the Preliminary Geotechnical Design Report (PGDR) for the project.

We appreciate this opportunity to be of service and look forward to continuing to work with you in the future. If you have any questions about this report or need additional services, please contact us at 619.831.4600.

Respectfully submitted,

KLEINFELDER

Janna Bonfiglio, PE 89334
Project Engineer

Scot Rugg, CEG 1651
Senior Engineering Geologist

Karthik Radhakrishnan, GE 3046
Senior Program Manager

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DOCUMENT 5

PRELIMINARY FOUNDATION REPORT
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER
DEL MAR, CALIFORNIA
KLEINFELDER PROJECT NO. 20180876.001A

JUNE 19, 2020

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ONLY THE CLIENT OR ITS DESIGNATED REPRESENTATIVES MAY USE THIS DOCUMENT AND ONLY FOR THE SPECIFIC PROJECT FOR WHICH THIS REPORT WAS PREPARED.

A Report Prepared for:

Mr. Tim Thiele, PE
City Engineer | Michael Baker International
City of Del Mar
1050 Camino Del Mar
Del Mar, California 92014

PRELIMINARY FOUNDATION REPORT
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER
DEL MAR, CALIFORNIA

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June 19, 2020
Kleinfelder Project No. 20180876.001A

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1 INTRODUCTION

The City of Del Mar has retained Kleinfelder to provide engineering services of the project plans, specifications and estimate (PS&E) phase of the Camino Del Mar Bridge Replacement project. The project will replace the existing bridge along Camino Del Mar and over the San Dieguito River. The purpose of this Preliminary Foundation Report (PFR) is to provide preliminary evaluation of site subsurface conditions, potential geologic and seismic hazards, and provide preliminary foundation recommendations to aid in the type selection for the proposed replacement bridge. The PFR is prepared in accordance with Caltrans' Foundation Report Guidelines (Caltrans, 2017) and is a companion report to a separately provided Preliminary Geotechnical Design Report (PGDR) for the proposed project. This PFR is not intended for final design of the project. Additional investigations and analyses will be required for final design as recommended in Section 5 of this report.

1.1 SCOPE OF WORK

The purposes of this report are to present the results of our Phase 0 geotechnical engineering investigation, evaluate the subsurface conditions at the site, determine potential geologic/seismic hazards, perform geotechnical engineering evaluations, and provide preliminary foundation recommendations for the proposed project.

The scope of services for this study included the following:

- Review of readily available geotechnical and geologic information including published geologic maps, topographic maps, aerial photography, previous and nearby geotechnical reports, and as-built and conceptual drawings;
- Obtain necessary geotechnical permits for performing explorations within the City of Del Mar right-of-way including preparation of a geotechnical investigation work plan;
- Coordination and oversight of utility clearance surveys, traffic control, and pavement coring for proposed exploration locations;
- Coordination and oversight of two exploratory borings and three Cone Penetrometer Tests (CPTs) within the existing Camino Del Mar Bridge Replacement project site;
- Performing laboratory testing on collected soil samples from the borings;
- Preparing this PFR which includes the following:
    - A description of the existing site and proposed project improvements including a site vicinity map and a site plan showing approximate locations of field explorations;

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- Discussion of pertinent geotechnical and geologic information based our review of existing geotechnical reports for the site and other available geotechnical and geologic information;
- Discussion of field exploration methods, logs of borings and CPTs, and laboratory test procedures and results;
- Discussion of the site and subsurface conditions observed during our field investigation;
- Discussion of the regional geologic and seismic setting and potential geologic hazards at the site;
- Seismic design parameters in accordance with the California Department of Transportation (Caltrans) 2019 Seismic Design Criteria including performance of a site-specific response analysis;
- Preliminary bridge foundation recommendations including axial pile capacity;
- Approach fill stability and settlement recommendations;
- Preliminary recommendations for retaining walls;
- Discussion of temporary excavations and shoring;
- Discussion of soil corrosivity properties affecting below-grade concrete and steel;
- Recommendations for further field investigations.

- Preparation of a Preliminary Geotechnical Design Report (PGDR) which is provided under a separate cover.

The recommendations contained within this report are subject to the limitations presented in Section 6.0 and are in conjunction with the PGDR for this project.

1.2 PROJECT DATUM

Unless otherwise noted, elevation data presented in this report are referenced to the North American Vertical Datum of 1988 (NAVD88) and the stationing is referenced from the project conceptual design drawings.

1.3 EXISTING SITE CONDITIONS AND AS-BUILT INFORMATION

The Camino Del Mar Bridge Replacement project site is located along the coast in Del Mar, California, crossing over the San Dieguito River which flows from the east and discharges into the Pacific Ocean. Based on our review of the project conceptual drawings and the topographic

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survey prepared by Sampo Engineering, Inc. and dated April 13, 2018, the site limits extend from approximately 400 feet north of the northern end of the bridge (approximate Station 170+00), near the access point to Del Mar North Beach, to approximately 400 feet south of the southern end of the bridge (approximate Station 156+00), just south of Sandy Lane. The existing bridge structure extends from approximate Station 166+00 at the northern end to approximate Station 160+00 at the southern end. The general site vicinity is shown on Figure 1 and the existing conditions of the site are provided on Figure 2. The coordinates of the approximate center of the bridge structure are:

Latitude: 32.9750 °N Longitude: 117.2690°W

The project site is bounded by the on-grade portion of Camino Del Mar roadway which eventually intersects with Via De La Valle to the north and Sandy Pointe to the south. The existing San Dieguito River and the Del Mar Racetrack venue bounds the project site to the east and the Del Mar North Beach, residential housing, and the Pacific Ocean bounds the project site to the west. The extents of the recreational beach areas located below and beyond the southern and northern portions of the bridge are dependent upon the season (dry or rainy season) and the typical tidal changes of approximately 4 feet throughout the day (NOAA, 2020). Based on our review of National Oceanic and Atmospheric Administration (NOAA) tidal information, we understand that the typical current tide elevations range from approximate elevation +0 feet to +4 feet throughout the day.

At the southern area of the bridge, existing grades of the beach area below the bridge generally range from approximate elevations +5 to +9 feet with a berm having an approximate slope inclination of 1½ horizontal to 1 vertical (1½H:1V) and ranging in elevation from approximately +6 to +16 feet extending up from the beach area to the bridge abutment. The surface of this berm at the southern end of the bridge is covered with rip-rap and some vegetation for erosion control.

Within the northern area of the bridge, existing grades of the beach area generally range from approximate elevations +5 to +8 feet with the roadway elevation at approximately +18 feet extending up from the beach area to the bridge abutment. The slope inclination of this berm is up to approximately 1¼H:1V and this slope is also covered with rip-rap and some vegetation for erosion control.

Based on our site reconnaissance, our review of as-built drawings (Powell and T.Y. Lin, 2001; Caltrans, 1951), and our review of the topographic survey, current conditions at the project site consist of the approximate 596-foot-long reinforced concrete girder bridge supported by ten piers

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and two abutments. Per the as-built plans and bridge inspection reports, the existing bridge was built in 1932 and widened with a pedestrian walkway and curb in 1953. Additional improvements to the bridge including replacement of pavements, pedestrian walkway, and railings were performed in 2001. Our review of the as-built drawings for the existing bridge indicates that the pier and the abutment pile caps extend to approximate elevation -17 ft National Geodetic Vertical Datum of 1929 (NGVD29) and are supported on 15-inch-diameter timber piles. The existing piers are spaced at 54 feet and are each supported by a total of 41 timber piles that are configured in three longitudinal rows with 14 piles in the outer rows and 13 piles in the center row. The existing pile lengths at the piers are unknown as the as-built drawings indicate pile depths were to be determined based on load testing. However, the as-built drawings do indicate the timber piles at the piers were assumed to be 25-feet-long, or extend to approximate elevation -42 ft NGVD29, for estimating purposes. The abutments are supported on a total of 66 timber piles also extending to an unknown depth. The as-built drawings indicate that some of these timber piles may be battered at the abutments. A summary of the existing foundation data is provided in Table 1.

Table 1
Summary of As-Built Foundation Data

Location	Foundation Type	No. of Piles at Each Support	Approx. Bottom of Pile Cap Elevation[1] (NGVD29)	Approx. Tip Elevation[1] (NGVD29)
Abutments	15-inch-diameter Timber Piles	66	-17 ft	-42 ft
Piers	15-inch-diameter Timber Piles	41	-17 ft	-42 ft

Notes: [1] Elevations are approximate as bottom of pile cap elevations and pile lengths are provided on the as-built drawings but were indicated to be for cost estimating purposes only.

Outside of the existing bridge limits, asphalt concrete (AC) pavement exists along the on-grade approach embankments along Camino Del Mar. A concrete median filled with landscaping separates the northbound and southbound directions of Camino Del Mar. Concrete sidewalks line the east and west sides of the on-grade portions of Camino Del Mar to the north and south of the bridge. An existing wire fence is located along the eastern sidewalk to the north of the bridge due to the steep embankment slopes extending along the east side of the street. Furthermore, street signs for pedestrian crosswalks are also present just south and north of the existing bridge.

The as-built drawings also indicate potential abandoned timber piles from an abandoned highway bridge located to the west of the existing Camino Del Mar bridge as well as for an abandoned pipeline trestle located adjacent to the east side of the existing bridge.

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Based on our site reconnaissance, utilities observed at the site include a 12-inch-diameter high pressure gas line and a 12-inch-diameter sanitary sewer line which are hung from the eastern side of the bridge and traverse the eastern side of the on-grade portion of Camino Del Mar. Additionally, a 4-inch-diameter high pressure gas line is hung from the western side of the bridge and traverses the western on-grade portion of Camino Del Mar. Communications markers and a an electrical box were also observed to the east of the Camino Del Mar roadway.

The existing conditions of the project site as well as the exploration locations are presented on Figure 2.

1.4 PROJECT DESCRIPTION

Based on our review of the draft conceptual drawings for the Bridge Type Selection Report (TSR) by Kleinfelder and discussions with the project design team, the proposed project is still in the bridge type selection phase and we understand that, after assessment of several alternatives, five bridge options are still currently being considered. These alternatives consist of various 5-span and 6-span cast-in-place box girder bridge options as well as 6-span precast concrete girder bridge options. Details of the features of each alternative including the pile type assumptions by the structural engineers and dimensions for each bridge option are provided in Table 2.

Table 2

Type Selection Bridge Options and Associated Pile Details

Alternative Number	Bridge Type Option	Abutment Support Assumptions	Pier Support Assumptions
1.1	5-Span Variable Depth Cast-In-Place Box Girder	Four 5-ft-diameter CIDH piles with 6-ft-diameter casing	Four piers each supported on two 10-ft-diameter CIDH piles with 11-ft-diameter casing
2.1	6-Span Variable Depth Cast-In-Place Box Girder	Four 5-ft-diameter CIDH with 6-ft-diameter casing	Five piers each supported on two 9-ft-diameter CIDH piles with 10-ft-diameter casing
2.2	6-Span Variable Depth Cast-In-Place Box Girder	Four 5-ft-diameter CIDH with 6-ft-diameter casing	Five piers each supported on four 6-ft-diameter CIDH piles with 7-ft-diameter casing
9.1	6-Span Prestressed Precast Concrete Girder	Four 5-ft-diameter CIDH with 6-ft-diameter casing	Five piers each supported on two 9-ft-diameter CIDH piles with 10-ft-diameter casing

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Table 2 (Continued)

Type Selection Bridge Options and Associated Pile Details

Alternative Number	Bridge Type Option	Abutment Support Assumptions	Pier Support Assumptions
9.2	6-Span Prestressed Precast Concrete Girder	Four 5-ft-diameter CIDH with 6-ft-diameter casing	Five piers each supported on four 6-ft-diameter CIDH piles with 7-ft-diameter casing

Note: 1. CIDH = Cast-In-Drilled-Hole Pile
2. Casing proposed to consist of smooth wall permanent steel casing

We understand that the width of the proposed bridge structure will be approximately 68½ feet and will be constructed in a two-phased system allowing continuous traffic flow during construction. The locations of the abutments and bents for each option vary but are anticipated to consist of constructing the proposed abutments behind the existing abutments and keeping portions of the existing abutments in place as additional scour and erosion protection. The existing piles for the piers will be removed with the proposed piers and associated piles will straddle the locations of the existing piers. As the new abutments are anticipated to be constructed behind the existing abutments, the length of the proposed Camino Del Mar replacement bridge is approximately 624 feet from the beginning of bridge (BB) to the end of bridge (EB).

Based on conversations with the project team and review of the draft conceptual plans, we understand that the design storm elevation is +14.55 feet corresponding to the 50-year storm plus 2 feet of freeboard water elevation. Due to this design storm elevation, the proposed bridge is required to be raised to a higher level than the existing bridge. We understand that several grading profiles are currently being evaluated that will require new approach fills and associated retaining walls extending from the edges of the abutments along the on-grade portion of Camino Del Mar. At this stage of the project, we understand that the proposed approach retaining wall type has not yet been selected and that the final wall dimensions are still under design. Based on the conceptual plans, the proposed approach fills are anticipated to be highest at the bridge abutment and will be graded to meet existing roadway grades away from the bridge. The extents of the approach fills are approximately 300 feet to the north and south of the proposed abutments.

In order to place the proposed approach fills, the existing asphalt pavement along the on-grade portion of Camino Del Mar will be demolished. Upon completion of fill placement, the on-grade surficial pavement will be replaced with new asphalt concrete pavement and an approximate 30-foot-long concrete approach slab.

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Permanent proposed slopes below the existing bridge, in front of the proposed abutments, are anticipated to be approximately 2H:1V. Temporary cut slopes and shoring may be required for the removal of portions of the existing bridge abutments and for re-direction of existing utilities at the site while cofferdams are anticipated for the proposed CIDH piles at the pier locations. Furthermore, temporary piles are anticipated to be required for temporary trestle bridges in order to construct the proposed deep foundations for the replacement bridge.

The current proposed conditions at the project site as well as the exploration locations are presented on Figure 3.

1.5 EXCEPTIONS TO POLICIES AND PROCEDURES

No exceptions to Caltrans policies or procedures were taken for the preparation of this report.

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2 FIELD INVESTIGATION

Our preliminary geotechnical investigation (Phase 0 investigation) consisted of review of available geotechnical information, advancing two exploratory borings, advancing three cone penetrometer tests (CPTs), and laboratory testing. The borings and two of the CPTs were performed within accessible areas near the existing bridge abutments. A third CPT was performed on the existing bridge deck near the central portion of the of the existing Camino Del Mar bridge. Laboratory testing and review of existing geotechnical and geologic information were also performed for our geotechnical investigation and are discussed in the subsequent sections. The approximate locations of the borings and CPTs performed by Kleinfelder are shown on Figures 2 and 3.

2.1 REVIEW OF EXISTING GEOTECHNICAL INFORMATION

The following previous geotechnical reports have been reviewed as part of our scope:

- "Preliminary Geotechnical Design Report (PGDR), Camino Del Mar Bridge Replacement (Bridge No. 57C-0209), Del Mar, California," prepared by Ninyo & Moore, dated July 31, 2018.
- "Preliminary Foundation Report (PFR), Camino Del Mar Bridge Replacement (Bridge No. 57C-0209), Del Mar, California," prepared by Ninyo & Moore, dated July 31, 2018.
- "Progress Report of Foundation Investigation on Road XI-SD-2-SD,A, San Dieguito River Basin, Station 1216 to Station 1280," prepared by the California Department of Public Works, Division of Highways (as available online on GeoDOG), dated May 25, 1960.
- "Supplemental Report of Foundation Investigation on Road XI-SD-2-SD,A, San Dieguito River Basin, Station 1216 to Station 1280," prepared by the California Department of Public Works, Division of Highways (as available online on GeoDOG), dated September 12, 1960, and associated logs of the borings (LOTBs).

The Ninyo & Moore reports were prepared for the Camino Del Mar Bridge Replacement project in which the results of two borings, designated as B-7 and B-8, and two CPTs, designated as CPT-11 and CPT-12, performed in March 2013 were presented. Boring B-7 and CPT-11 were performed near the existing northern bridge abutment and Boring B-8 and CPT-12 were performed near the existing southern bridge abutment. In general, Ninyo & Moore reportedly encountered undocumented fill material overlying successive strata of alluvial deposits and the Del Mar Formation in their explorations. A summary of the Ninyo & Moore explorations is provided in Table 3 and a summary of the subsurface conditions reported from the explorations is provided in Table 4.

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Table 3

Summary of Previous Geotechnical Investigation

Exploration No.	Location (Closest Approx. Station)	Drill Date	Reported Ground Surface Elev. (ft, MSL)	Drilled Depth (ft)
B-7	North Abutment (167+00)	3/11/2013	+17	81½
B-8	South Abutment (158+00)	3/15/2013	+14	95
CPT-11	North Abutment	3/13/2013	+17	155
CPT-12	South Abutment	3/13/2013	+14	196

Table 4

Summary of Subsurface Conditions from Previous Geotechnical Investigation

Location (Explorations)	Depth of Bottom of Fill/Top of Alluvial Deposits	Depth of Bottom of Alluvial Deposits/Top of Del Mar Formation	Groundwater Elevation (ft, MSL)
North Abutment (B-7 & CPT-11)	14 ft	145 ft	+3
South Abutment (B-8 & CPT-12)	12 ft	Not Encountered	+1½

The fill encountered in the Ninyo & Moore explorations reportedly consisted of brown and light gray, very loose to medium dense silty sand with trace amounts of shells, gravel, and asphalt fragments. The alluvium reportedly consists of gray and black, very loose to very dense silty sands with trace amounts of gravel interlayered with soft to very stiff lagoonal silts and clays.

As noted in Table 4, the alluvium extended to the termination depths of the boring and CPT performed near the southern end of the bridge. Ninyo & Moore reported in their report that the alluvium extended to the termination depth of all CPTs performed at the site; however, a cross-section was provided by Ninyo & Moore in their report showing a contact with the underlying Del Mar Formation at approximately 145 feet bgs in CPT-11. Based on our review of the CPT logs provided in the Ninyo & Moore report, our review of other available geologic information in the site vicinity, and the results of our field investigation as discussed in Section 3.2 of this report, we anticipate that the Del Mar Formation was encountered around this depth in CPT-11 location as shown on the Ninyo & Moore cross-section.

The progress and supplemental reports prepared by the Division of Highways in 1960 provide insight on the embankment construction proposed by the State over 50 years ago prior to

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construction of the Camino Del Mar bridge, indicating deeper fills may be present at the site, particularly near the abutment areas.

The Ninyo & Moore boring and CPT logs, locations of explorations, geologic cross-section, and laboratory test results are provided in Appendix E for reference along with the Division of Highway LOTBs.

2.2 CURRENT FIELD EXPLORATIONS

2.2.1 Rotary Wash Borings

Two rotary-wash boreholes, designated as R-20-001 and R-20-002, were drilled near the existing abutments of the Camino Del Mar Bridge. Borings R-20-001 and R-20-002 were completed using augering techniques in the upper soils and then rotary wash techniques below groundwater and were performed to depths of approximately 151 feet and 208 feet below ground surface (bgs), or to approximate elevations -135 feet and -192 feet, respectively. The drilling was performed by Pacific Drilling Co. between February 10th and February 21st, 2020 using a truck-mounted drill rig equipped with 8-inch outer-diameter hollow stem augers and a 4-inch-diameter tri-cone roller bit.

The boring information including boring locations and depths explored are summarized in Table 5. The geotechnical boring logs are presented in Appendix A and on the Log of Test Borings (LOTBs) in Appendix D and the locations of the borings are presented on Figures 2 and 3. The subsurface conditions encountered during drilling are summarized in Section 3.2 of this report.

Table 5

Boring Summary

Boring No.	Location (Closest Approx. Station)	Completion Date	Hammer Efficiency[1]	Approx. Ground Surface Elev. (ft, NAVD88)	Drilled Depth[2] (ft)	Groundwater Elevation (ft)
R-20-001	North Abutment (167+00)	2/21/2020	94	+16	151	+2
R-20-002	South Abutment (159+00)	2/13/2020	94	+16	208	+5

Notes: [1]Hammer efficiency as provided by Pacific Drilling for Marl Truck-Mounted Rig equipped with an Automatic Hammer.
[2]Drilled depths encountered practical refusal prior to the planned termination depth.

2.2.2 Cone Penetrometer Tests (CPTs)

Four cone penetrometer tests (CPTs), designated as CPT-20-001, CPT-20-002, CPT-20-002A, and CPT-20-003, were performed by Fugro between February 18th to February 21st, 2020. The

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CPTs, which include advancement of one seismic CPT (SCPT), were advanced to depths ranging from 16 feet to 200 feet below the ground surface or bridge deck. The CPTs were advanced using a truck-mounted CPT drill rig with a 30-ton push capacity equipped with a 15cm^2 cone-shaped probe attached to cylindrical steel rods instrumented with a cylindrical-shaped friction sleeve and pore pressure transducer. During advancement of the CPTs, the cone tip penetration resistance, friction resistance along the friction sleeve, and pore water pressure were recorded. For the SCPT, shear wave velocity measurements were taken at 5-foot intervals using a cone tip equipped with geophones.

CPT-20-001 and CPT-20-003 were performed near the existing bridge abutments and CPT-20-002 and CPT-20-002A were performed through the bridge deck near the center of the existing bridge. The CPTs performed within the bridge deck required casing to be installed from the bridge deck to below the mud line of the river channel to support the CPT rods. CPT-20-002 was quickly abandoned at 16 feet below the bridge deck after beginning the CPT due to sinking of the casing and CPT rods into the soft, underlying soils in the river channel. Therefore, CPT-20-002A was advanced at the same location as a second attempt to perform the CPT on the bridge deck but refused at a depth of approximately 37 feet below the bridge deck, or at approximate elevation of -21 feet.

Prior to advancement of the CPTs, public and private utility locating was performed and the surficial pavement was cored. The first approximate five feet of the CPTs performed near the bridge deck were advanced by manual hand auger to further clear for underground utilities. Upon completion of the CPTs, the rods were extracted and the surface was patched with either AC near the abutments or concrete within the bridge deck.

The CPT information including CPT locations and depths explored are summarized in Table 6. A detailed description of the CPT methodology, logs of the CPTs, and the SCPT shear wave velocity measurements are presented in Appendix B. Subsurface conditions interpreted from the CPT data are presented in Section 3.2.

Table 6

CPT Summary

CPT No.	Location (Closest Approx. Station)	Completion Date	Approx. Ground Surface Elev. (ft, NAVD88)	Explored Depth[1] (ft)
CPT-20-001	North Abutment (167+00)	2/18/2020	+16	158
CPT-20-002A	Bridge Deck (163+00)	2/21/2020	+16	37
CPT-20-003	South Abutment (159+00)	2/19/2020	+16	200

Notes: [1]Explored depths encountered practical refusal prior to the planned termination depth.

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2.3 LABORATORY TESTING

A laboratory testing program was conducted to substantiate field classifications and evaluate selected physical characteristics and engineering properties of the soils encountered. Moisture content, unit weight, Atterberg Limits, sieve analyses, R-value, direct shear, unconfined compression, unconsolidated undrained triaxial compression (TXUU), and corrosion tests were performed in general accordance with the applicable ASTM or Caltrans test methods. Results of the laboratory testing program are presented in Appendix C.

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3 GEOTECHNICAL CONDITIONS

3.1 REGIONAL SETTING

In addition to our review of previous and nearby geotechnical reports and LOTBs, our geologic evaluation also consisted of reviewing available aerial photographs, topographic maps, and geologic maps along with observation of the existing site conditions during our subsurface investigation. The results of the evaluation are included in the following sections.

3.1.1 Soil Survey

Based on our review of the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) web soil survey results (accessed May 2020), the surficial deposits at the site consist of lagoon water (LG-W) underneath the existing bridge, Tujunga Sand (TuB) to the south of the bridge, and tidal flats (Tf) to the north of the bridge.

Tujunga sand is reported to primarily consist of 'somewhat excessively drained' fine sand, gravelly sand, loamy sand, and gravelly loamy sand having a hydrologic soil group A, negligible runoff class, and high to very high infiltration capacity. Tidal flats are reported to have a negligible runoff class but are reported to be Hydrologic Soil Group D and be very poorly drained due to the depth of the water table and frequency of flooding where these are mapped.

3.1.2 Geologic Setting

The site is located within the coastal zone of the Peninsular Ranges Geomorphic Province (Norris and Webb, 1990). This province stretches from northern Los Angeles County to the tip of Baja California and is dominated by mountainous terrane composed of Cretaceous-age igneous rocks of the Southern California Batholith and various Jurassic-age metamorphic rocks. The lower-lying flanks of this basement complex are covered with a variety of younger sedimentary rocks. Within San Diego County, these sedimentary rocks consist of a westward thickening clastic wedge comprised of three sequences of deposits.

The oldest sequence consists of claystone, siltstone, sandstone, and conglomerate deposited during the late Cretaceous time as an apparent submarine fan (Abbott, 1999). These units crop out on Mt. Soledad in La Jolla, Point Loma, and Carlsbad. The second sequence of sediments was deposited during the Tertiary (Eocene and Pliocene) period within an embayment that stretched from northern San Diego County into Mexico (Kennedy, 1975). The sediments consist of a variety of claystone, siltstone, sandstone, and conglomerate. The most recent sedimentary

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deposits consist of early to late Pleistocene, near-shore marine, estuarine, and delta deposits, also typically identified as terrace deposits. Most of these sediments were deposited on wave cut surfaces (terraces) developed in response to sea level fluctuations during the Pleistocene. The oldest terrace deposits (Qvop), deposited during the early to middle Pleistocene, and the youngest terrace deposits (Qop), deposited during the late Pleistocene, have been mapped throughout the coastal region of San Diego County including in the vicinity of the project site.

During the late Pleistocene, the land surface throughout San Diego County was down-cut and eroded by fluvial processes in response to a world-wide, glacially-induced drop in sea level. This erosional event resulted in the dissected system of east to west flowing drainages and intervening basins that empty into the Pacific Ocean. Near the coast, these drainages were down-cut several hundreds of feet below current sea-level elevations. Near the end of the Pleistocene epoch and continuing up to the present, sea level gradually rose as the continental glaciers receded. This event forced in-filling of the eroded drainages with alluvial sediments which range in age from the latest Pleistocene to recent times. The project site is located within one of these drainages associated with the San Dieguito River. The surrounding highlands to the north and south are comprised of Pleistocene-age old paralic deposits (Qop_6) deposited over Eocene-age sedimentary rocks consisting of the Del Mar Formation (Td) and the Torrey Sandstone (Tt). These deposits are shown on the Regional Geologic Map presented as Figure 4.

3.1.3 Tectonic Setting

California is one of the most tectonically active areas of the United States. The high seismicity of California is attributed to the fact that the state straddles the boundary of two global tectonic plates known as the North American Plate (on the east) and the Pacific Plate (on the west). The main plate boundary fault is defined by the San Andreas fault which crosses through some of the most densely developed areas of both Southern and Northern California. This fault stretches northwest from the Gulf of California in Mexico, through the desert region of the Imperial Valley, crossing the San Bernardino region, and traversing up into northern California, where it eventually trends offshore near San Francisco (Jennings, 1994; Jennings and Bryant, 2010). Within Southern California, the plate boundary is actually a complex system of numerous faults known as the San Andreas Fault System (SAFS) that spans a 150-mile-wide zone from the main San Andreas fault in the Imperial Valley, westward to offshore of San Diego (Powell et al., 1993; Wallace, 1990).

The major faults east of the site (from east to west) include the San Andreas, San Jacinto, and Elsinore faults. Major faults west of the site are all offshore and include the Rose Canyon-Newport-Inglewood, Palos Verdes-Coronado Bank, San Diego Trough, and San Clemente faults

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(Kennedy and Welday, 1980). The most dominant zone of active faulting within the San Diego region is the Rose Canyon Fault Zone (RCFZ).

Approximately 49 mm/yr of overall lateral displacement has been measured geodetically as fault slip across these plate boundaries. The Elsinore, San Jacinto, and San Andreas faults combined account for up to approximately 41 mm/yr of the total plate displacement (84 percent), meaning that the remaining 8 mm/yr (16 percent) is accommodated across the offshore faults to the west of the site (Bennett et al., 1996). Studies within the Rose Canyon, east of Mount Soledad, have revealed fault strands that have displaced Holocene soil horizons with slip rates from 1 to 2.4 mm/yr (Rockwell, 2010).

The RCFZ may be part of a more extensive fault zone that includes the Offshore Zone of Deformation and the Newport-Inglewood fault to the north (Grant and Shearer, 2004; Sahakein, et al., 2017), and several possible extensions southward, both onshore and offshore (Treiman, 1993). The RCFZ is composed of predominantly right-lateral strike-slip faults that extend north to northwest through the San Diego metropolitan area towards La Jolla, however, various fault strands display normal, oblique, or reverse components of displacement as well. The fault zone extends offshore at La Jolla and continues north-northwest subparallel to the coastline. To the south in the San Diego downtown area the fault zone appears to splay out into a group of generally right-normal oblique faults extending into San Diego Bay (Treiman, 1993).

The closest fault to the site is the off-shore portion of the Rose Canyon-Newport-Inglewood connected fault located approximately 2.2 miles west of the site. The locations of this and other nearby faults with respect to the site is shown on the regional fault and seismicity map shown on Figure 5.

3.2 SURFACE AND SUBSURFACE CONDITIONS

Geologic units observed in the borings consist of successive strata of recent alluvial deposits, young alluvial deposits, young estuarine deposits, old alluvial deposits, and the Del Mar Formation. The alluvial deposits underly surficial pavement and artificial fill material and overly the Del Mar Formation. The areal extent of these geologic units is depicted on the regional geologic map in Figure 4. Artificial fill soils overlie the alluvial deposits and existing AC pavement caps the fill soils at the surface at the approach embankments on both the north and south sides of the bridge. Detailed descriptions of these units are provided on the boring logs in Appendix A and generalized descriptions are provided in the subsequent sections below. Additionally, the subsurface geologic conditions are also depicted on the geologic cross-section in Figure 6.

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3.2.1 Surficial Pavement

Asphalt concrete (AC) was encountered at the surface of all the boring and CPTs performed for our study. The surficial AC was measured to be approximately 5 to 6 inches thick in the borings and CPTs performed near the abutments. At the CPT-20-002/2A location, a 5-inch-thick surficial AC layer was underlain by approximately 12 inches of reinforced concrete associated with the bridge deck.

3.2.2 Artificial Fill (af)

Artificial fill soils were encountered underlying the surficial pavement in the borings and CPTs performed near the abutments. The fill material generally consists of yellowish red, dark yellowish brown, strong brown, and light brownish gray poorly graded sand with variable amounts of silt and trace amounts of gravel. The fill layer extends to depths of approximately 9 feet bgs in boring R-20-001 located near the existing northern abutment, or to approximate elevation +7 feet, and to 8½ feet bgs in boring R-20-002 located near the existing southern abutment, or to approximate elevation +7½ feet. Based on our review of previous plans, these fills were likely placed for the existing bridge embankments and it is possible that deeper fills may be present beyond our exploration locations. Field SPT penetration blow counts (field N-values corrected only for sampler type) of the fill material ranged from 10 to 26 blows per foot (bpf) corresponding to medium dense material.

No earthwork reports were available for our review documenting placement and/or compaction of the encountered fill. Therefore, the existing fill at the site is considered undocumented.

3.2.3 Recent Alluvial Deposits (Qa)

Recent alluvial deposits were encountered underlying the fill materials in the borings and CPTs performed near the existing abutments and were encountered at the ground surface below the bridge deck in CPT-20-002/2A. The recent alluvial materials generally consist of brown, gray, and dark gray silty sand and poorly graded sand with various amount of silt and gravel. An interbedded lean to fat clay layer was encountered within the recent alluvium in boring R-20-001 and CPT-20-001 at the northern end of the existing bridge. This clayey layer likely pinches out towards the south as evidenced by the subsurface conditions encountered in the CPT-20-002/2A and CPT-20-003 and boring R-20-002. This geologic unit is a loose modern alluvial deposit of the San Dieguito River. Field SPT N-values ranging from 2 to 34 bpf for coarse-grained layers and 4 to 8 bpf for fine-grained layers, corresponding to very loose to dense and soft to medium stiff materials. Furthermore, CPT tip resistances in this unit generally ranged from approximately 5 to

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greater than 200 tsf and field pocket penetrometer values of 0 tsf were observed in the fine-grained samples of this unit. It should be noted that the presence of gravel may result in unreasonably high SPT N-values or tip resistances.

The thickness of the recent alluvial deposits varies at the site with thicker recent alluvium at the northern end of the existing bridge. The recent alluvium extends to a depth of approximately 48 feet bgs in the explorations performed at the northern end of the bridge, or to approximately elevation -32 feet. At the southern end of the existing bridge, the recent alluvium extended to a depth of approximately 30 feet bgs, or to approximate elevation -14 feet. CPT-20-002/2A, performed within the center of the bridge, terminated in the recent alluvial deposits.

3.2.4 Young Alluvial Deposits (Qya)

Middle Holocene-age young alluvial deposits were encountered underlying the recent alluvial deposits in the borings and CPTs performed near the existing abutments. This unit generally consists of dark gray silty sand and poorly graded sand with various amount of silt and trace amounts of gravel and shells and thin interbedded clayey layers. This geologic unit was encountered to be loose to very dense as evidenced by field SPT N-values ranging from 8 to greater than 50 bpf with an average field SPT N-value of 33 bpf, and CPT tip resistances generally ranging from approximately 20 to greater than 300 tsf.

The thickness of the young alluvial deposits was encountered to be approximately 37 feet thick in explorations performed near the northern abutment and approximately 48 feet thick in the explorations performed at the southern abutment. The young alluvium extended to depths of approximately 78 to 85 feet bgs, or to approximate elevations of -62 feet and -69 feet, at the southern and northern abutments, respectively.

3.2.5 Young Estuarine Deposits (Qyes)

Below the young alluvial deposits, a relatively thin layer of Middle to Early Holocene-age young estuarine deposits was encountered in the borings and CPTs performed near the abutments. This geologic unit generally consists of an approximate 6 to 8-feet-thick black and dark gray, low to medium plasticity, lean clay with trace amounts of sand, mica, and shells. The fine-grained conditions encountered in this unit represent a pause in sea-level rise which occurred at the end of the Pleistocene indicating a transition from the young alluvium overlying above and old alluvium below.

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The young estuarine deposits extended to a depth of approximately 95 feet bgs in the explorations performed at the northern end of the bridge, or to approximately elevation -79 feet. At the southern end of the existing bridge, the recent alluvium extended to a depth of approximately 94 feet bgs, or to approximate elevation -78 feet. Field pocket penetrometer values of 0.5 tsf were observed in this unit and field SPT N-values in this unit ranged from approximately 8 to 21 bpf, with an average of approximately 12 bpf, indicating stiff to very stiff fine-grained materials. Furthermore, CPT tip resistances generally ranged from approximately 9 to 36 tsf in the fine-grained portions this unit.

3.2.6 Old Alluvial Deposits (Qoa)

Pleistocene-age old alluvial deposits were encountered underlying the young estuarine deposits in the borings and CPTs performed near the existing abutments. The old alluvial materials generally consist of very dark gray silty sand and poorly graded sand with silt. Boring R-20-002 and CPT-20-003 refused and terminated in the old alluvium unit at depths of approximately 200 and 208 feet bgs, or at approximate elevation of -184 feet and -192 feet, as gravel content increased in the old alluvium. In boring R-20-001 and CPT-20-001 performed near the northern abutment, the old alluvium extended to a depth of approximately 146 feet bgs, or to approximate elevation -130 feet. The old alluvial deposits were encountered to be medium dense to very dense as evidenced by field SPT N-values ranging from 10 to greater than 50 bpf, with an average of approximately 30 bpf, and CPT tip resistances generally ranging from approximately 30 tsf to greater than 300 tsf.

3.2.7 Del Mar Formation

The Del Mar Formation is an Eocene-age geologic unit deposited in an ancient lagoonal environment. It was encountered below the old alluvial deposits at the northern end of the bridge in boring R-20-001 and CPT-20-001 at an approximate depth of 146 feet, or approximate elevation -130 feet. This geologic contact is generally consistent with the contact of the Del Mar Formation reported in Ninyo & Moore CPT-11 which was also performed near the northern end of the bridge. The Del Mar Formation was penetrated approximately five feet and was observed in one sample to consist of dark reddish brown with grayish green claystone. This unit is known to also have interbedded sandstone layers. Field SPT N-values of the Del Mar Formation were greater than 50 bpf and CPT tip resistances generally ranged from 100 to 300 tsf corresponding to very dense material.

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3.3 UNSUITABLE MATERIALS

3.3.1 Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or pavements supported on grade.

Visual classification of the soils near anticipated subgrade elevations indicates that these soils primarily consist of non-plastic poorly-graded sand with small amounts of silt. Based on the results of our field investigation and review of existing information, it is our opinion that the site soils near the ground surface generally have a very low to low expansion potential. Isolated zones of more expansive soil may also be encountered near the surface but are not anticipated.

3.4 SURFACE WATER AND GROUNDWATER

Groundwater was encountered in all the borings and CPTs performed for our field investigation. Encountered groundwater depth ranged from approximately 11 to 14 feet bgs, or at approximate elevations +5 to +2 feet, during drilling. Upon completion of drilling, the groundwater levels were measured to be approximately 17 feet bgs, or approximate elevation -1 foot. It should be noted that the borings were converted into rotary wash upon encountering groundwater. Circulation of water and drilling mud in the boreholes are required as part of the rotary wash drilling. Therefore, water level measurements after completion of the borings may have been influenced by introduction of water and drilling fluids in the boreholes. Also, some rains occurred prior to and during our field investigation and a rise and fall in the water surface level within the San Dieguito River channel was observed.

The Ninyo & Moore borings for this site reported groundwater at depths of approximately 12½ and 14 feet bgs, or at approximate elevations +1½ feet and +3 feet.

Due to the proximity of the site to the coast, groundwater levels are expected to fluctuate due to tidal and seasonal influences. Based on our available information review, we understand that historic minimum and maximum tidal elevations ranges from approximate elevation -3 feet to +7½ feet (NOAA, 2020). The design storm elevation for the project is determined to be +14.55 feet based on the project conceptual plans.

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The flood hazard potential for the site was evaluated based on the Federal Emergency and Management Administration (FEMA) Flood Insurance Rate Maps (FIRM). These maps identify those areas that may be subject to special flood events. According to FEMA FIRM 06073C1307H dated December 20, 2019, the site is located within a regulatory floodway flood hazard area with a base flood elevation of 12 feet NAVD 88. Therefore, the hazard at the site with respect to flooding is considered high and flood loads should be considered in the design in accordance with the AASHTO Bridge Design Specifications. We understand that a design flood elevation of +14.55 feet is currently being used for design which corresponds to a 50-year event plus two feet of freeboard.

3.5 SCOUR POTENTIAL

Scour is the loss of ground by erosion in flowing water environments caused by changes in flow volume, flow velocity or flow direction. Scour can occur over the width of the stream or river bed and can be concentrated at locations in which hard protrusions occur in a river bed, such as at bridge piers. The San Dieguito River channel may scour during high flow events and could be impacted by the construction of the new bridge piers and removal of existing piers.

We understand that rip-rap slope protection will be placed at the abutment slopes to protect the abutment from surficial erosion and scour, as is the existing condition at the site. For the bridge piers, we understand that general and local scour have been estimated along the San Dieguito River channel by the project hydraulic engineer. Based on conversations with the hydraulic engineer, we understand that at the deepest part of the river channel (approximately 150 feet south of the northern abutment), general scour elevation at peak flow assuming a 200-year flood event reaches elevation -14.5 feet NAVD88, which is up to approximately 8½ feet below initial bed conditions at this location within the river channel. Scour towards the southern abutment, where the initial bed elevation is higher, is estimated to reach approximate elevation -10 feet NAVD88 during peak flow for the 200-year flood event, which is approximately 16 to 18 feet below initial bed conditions.

For local scour, the 200-year flood event was used to estimate scour depths. Dependent on the bridge option and pier analyzed, local pier scour ranged from 15.7 feet to 21.1 feet in depth. Local pier scour should be added to general scour depth to obtain total scour for design. These scour estimates should be updated once the final bridge option is selected.

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3.6 CORROSION POTENTIAL

Preliminary laboratory corrosive soil screening of the on-site soils was performed on samples collected from borings R-20-001 and R-20-002 to evaluate the potential corrosion on concrete and ferrous metals. The results of the testing are presented in Table 7 and included in Appendix C. Furthermore, one laboratory corrosion test was performed on a near-surface sample from Ninyo & Moore boring B-8 performed at the southern end of the bridge. The results from this test are also provided in Table 7 as well as in Appendix E.

Table 7
Preliminary Corrosion Test Results

Boring	Depth (feet)	Minimum Resistivity (ohm-cm)	pH	Water Soluble Sulfates (ppm)	Water Soluble Chlorides (ppm)
R-20-001	0.5 - 5.5	12,000	9.0	42	21
R-20-001	51-51.5	190	9.0	600	2,460
R-20-002	0.5 - 4	13,000	8.7	45	21
R-20-002	126-126.5	85	8.0	870	7,480
B-8 (N&M)	5-6.5	10,000	8.4	40	50

Caltrans Corrosion Guidelines (Caltrans, 2018) considers the subsurface conditions at a site to be aggressive to below-grade concrete if one or more of the following conditions exist for the representative soil samples taken at the site: chloride concentration is 500 parts per million (ppm) or greater, sulfate concentration is 1,500 ppm or greater, or the pH is 5.5 or less. Since resistivity serves as an indicator parameter for the possible presence of soluble salts, it is not included as a parameter to define a corrosive area for structures based on Caltrans Guidelines.

Based on the Caltrans criteria, the near-surface artificial fill soils are considered to be not aggressive to below-grade metals or concrete. However, the natural soils at depth below the groundwater table are considered to be aggressive to below-grade concrete due to the high soluble chloride concentration laboratory test results. Based on these test results and the proximity of the project site to salt water, buried metal and concrete elements should be designed for corrosive conditions in accordance with applicable sections of the AASHTO Bridge Design Specifications with California Amendments and Caltrans Memos to Designers and Standard Specifications.

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Preliminary corrosion tests are only an indicator of potential soil aggressivity for the sample tested. We recommend that additional corrosion tests be performed at variable depths and on soil samples taken at additional investigative locations. Furthermore, due to the proximity of the site to the Pacific Ocean and the high groundwater table encountered at the site, we recommend corrosion of below-grade elements should consider corrosive groundwater conditions as well. Corrosion test results should be reviewed and evaluated by the project designers considering the proposed improvements and project lifespan requirements. Kleinfelder does not practice corrosion engineering and the purpose of our tests is only to provide a preliminary screening. A qualified corrosion engineer should be contacted for detailed evaluation of corrosion potential with respect to construction materials at this site and the proposed design.

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4 PRELIMINARY SEISMIC INFORMATION AND RECOMMENDATIONS

Kleinfelder has reviewed the site with respect to potential seismic hazards. This evaluation is based on review of available geologic maps, aerial photographs, topographic maps, hazard maps, our geologic site reconnaissance, boring, CPT, and laboratory data, and engineering analyses. Potential seismic hazards considered in our study include surface fault rupture, seismic shaking, liquefaction and seismically induced settlement, lateral spreading, seismic slope instability, and tsunamis. The following sections discuss these hazards and their potential at this site in more detail.

4.1 POTENTIAL SEISMIC HAZARDS

4.1.1 Surface Rupture

As previously discussed in Section 3.1, the subject site is not underlain by any known active or potentially active faults. The closest active fault is the Rose Canyon-Newport Inglewood off-shore fault which is located approximately 2.2 miles offshore to the west of the site. The results of our site reconnaissance and review of historical aerial photography did not reveal indications of faults crossing the project site. Based on this data, it is our opinion that the potential for ground rupture due to faulting at the site is negligible.

4.1.2 Liquefaction and Seismic Settlement

The term liquefaction describes a phenomenon in which saturated, cohesionless soils temporarily lose shear strength (liquefy) due to increased pore water pressures induced by strong, cyclic ground motions during an earthquake. Structures founded on or above potentially liquefiable soils may experience bearing capacity failures due to the temporary loss of foundation support, vertical settlements (both total and differential), and undergo lateral spreading. The factors known to influence liquefaction potential include soil type, relative density, grain size, confinement, depth to groundwater, and the intensity and duration of the seismic ground shaking. Liquefaction is most prevalent in loose to medium dense sandy and gravely soils below the groundwater table but can also occur in non-plastic to low plasticity fine-grained soil.

Based on the guidelines provided for liquefaction evaluation in the Caltrans Geotechnical Manual (Caltrans, 2020), evaluations of potential liquefaction susceptibility based on groundwater level, deposit age, and soil composition were made according to the criteria of Youd et al. (2001), Boulanger and Idriss (2006), and Caltrans' Geotechnical Manual. For CPT analyses, we used the recommendations of Youd et al. (2001) to consider layers with soil behavior type index, I_c<2.6 as

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potentially liquefiable. It should be noted that based on these criteria, the old alluvial deposits were considered to have a low liquefaction susceptibility based on the age of the geologic deposits.

For layers that met the compositional criteria, liquefaction triggering (factor of safety) analyses were performed using methodologies proposed by Youd et al. (2001) (NCEER, 2001). The analyses utilized both SPT data from our boreholes and tip resistance from our CPTs. In order to perform liquefaction analysis, estimated earthquake magnitude (M_w) and peak ground acceleration (PGA) are needed. Liquefaction analyses were evaluated for a magnitude of 6.63 and a PGA of 0.41g based on Caltrans ARS Online V3.0.1. A groundwater depth of 10 feet was used in our analysis for the explorations performed near the abutments due to potential fluctuations of groundwater level due to tidal influence.

Based on the Liquefaction Evaluation Guidelines in Caltrans' Geotechnical Manual, liquefaction triggering potential was only evaluated for the upper 70 feet and liquefaction-induced volumetric settlements are only reported for induced settlements in the upper 50 feet. It should be noted that there is a potential for liquefaction to occur at deeper depths based on our analyses, however, due to the depths of these deposits and associated overburden stresses, liquefaction at these depths are likely to not result in volumetric surface settlements.

Liquefaction-induced volumetric settlements were estimated using the methods of Tokimatsu and Seed (1987) and Zhang et al. (2002). Based on the methods used, the seismic loading, and the site conditions, the calculated post-liquefaction vertical volumetric settlements within the upper 50 feet of the soil profile generally ranged from 3 to 7 inches.

Another type of seismically-induced ground failure that can occur as a result of seismic shaking is dynamic compaction, or seismic settlement. This phenomenon typically occurs in unsaturated, loose to medium dense granular material or poorly-compacted fill soils. The granular fill soils encountered above the groundwater table at the site were generally found to be in a medium dense condition. We evaluated seismic settlement potential of the existing artificial fill soils using the method of Tokimatsu and Seed (1987). Based on the results of the borings and CPTs and the seismic loading, we calculated seismic compression settlement to be less than approximately 1/3-inch.

The liquefaction and seismic settlement calculations for the borings and CPTs from our field investigation are provided in Appendix G.

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4.1.3 Lateral Spreading at Piers

Because the limited height of slopes within the active river channel and configuration of the proposed bridge piers, the static stability of the river channel slopes is not considered consequential to the bridge and therefore was not analyzed.

The active river channel geometry and underlying liquefiable soils present conditions where there is a potential for lateral spreading. Empirical lateral spreading analyses were performed using the results of the borings and CPTs and the methodology by Youd et al. (2002) in accordance with Caltrans Lateral Spreading Guidelines (Caltrans, 2020) and are presented in Appendix G. The methodology is performed for "free field" conditions in which the resistance from the piers are conservatively not modeled which is considered adequate for the type selection stage of design. For the site's PGA of 0.41g and mean magnitude of 6.63 per Caltrans ARS Online V3.0.1, the analyses indicate median free field lateral spreading displacements of approximately 4½ to 6 feet for sloping conditions within the river channel. These displacements would occur toward the channel, basically along the longitudinal axis of the bridge. It should be noted that the borings and CPTs performed near the abutments were also used to analyze lateral spreading as geotechnical information is limited within the existing river channel.

Lateral spreading toward the channel would be resisted by the proposed foundations and the resulting lateral spreading displacements are expected to be less than a free field condition. Once type selection is finalized, the bridge designer should analyze and develop the restraining forces of the piles at the piers in accordance with Caltrans' Memo to Designers 20-15 (Caltrans, 2017) so that updated lateral displacements considering the proposed foundations can be estimated. Furthermore, the bridge designer should account for loading on the foundations from lateral spread displacements in accordance with Caltrans' Guidelines on Foundation and Deformation Loading due to Liquefaction Induced Lateral Spreading (Caltrans, 2013).

4.1.4 Tsunami Hazard

A tsunami is a giant sea wave usually generated by catastrophic displacement on a submarine fault. Tsunamis can travel at speeds of hundreds of miles per hour over distances of thousands of miles. In the open ocean, tsunamis have large wavelengths and are difficult to detect. As the sea wave approaches shore, the wave decreases in wavelength and increases in amplitude (height). Large tsunamis can travel well beyond the normal wave break of the shoreline and can cause damage to near-shore structures. Based on the "Tsunami Inundation Map for Emergency Planning, State of California, County of San Diego, Del Mar Quadrangle," prepared by the

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California Emergency Management Agency, dated June 1, 2009, the project site is located within a mapped tsunami inundation area. Therefore, we anticipate the potential for damage due to a tsunami is considered high for the site.

Furthermore, since the site is located within a half-mile of the Pacific Ocean and is situated below an elevation of +40 feet MSL, tsunami hazard should therefore be considered in the design phase of the project, including potential hydrostatic loads on bridges and retaining walls, in accordance with Caltrans' Memo to Designers 20-13 (Caltrans, 2010). Based on an information request submitted to Caltrans by the design team, we understand that the maximum design wave elevation is +10.7 feet NAVD88 with a maximum design flow velocity of 9.8 ft/s (3 m/s). We understand that these values consider sea level rise to year 2100 which is applicable for tsunami hazard. Although the roadway elevation is above this, this design tsunami wave should be considered in the design of the project structures in accordance with Caltrans standards where applicable.

4.1.5 Seismic Slope Instability

We evaluated the slope stability for yield acceleration and post-liquefaction conditions along the abutment slopes at the project site. Details regarding the slope stability methodology and results are provided in Section 5.3 of this report along with estimated seismic slope displacements.

4.2 SEISMIC SHAKING AND PRELIMINARY SEISMIC DESIGN PARAMETERS

As discussed in Section 3.1.3, the project site is located in a seismically active region. The most significant seismic event likely to affect the project site would be an earthquake resulting from rupture along the offshore Rose Canyon fault, which is located approximately 2.2 miles west of the site.

Based on the results of our field investigation in which we performed a SCPT at the southern portion of the site, the average shear wave velocity in the upper 100 feet (30 meters) of the soil profile, deemed the V_{S30} value, is estimated to be approximately 710 ft/s. This V_{S30} value corresponds to a Soil Profile Type D based on Caltrans Seismic Design Criteria (SDC) V2.0 (Caltrans, 2019). Soil Profile Type D is defined as a stiff soil site with average shear wave velocities within the upper 100 feet of the soil profile between 600 and 1,200 ft/s, an average field standard penetration resistance between 15 and 50 bpf, or an average undrained shear strength between 1,000 and 2,000 psf.

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However, as discussed in Section 4.1.2 of this report, there is a high liquefaction hazard at the site and; therefore, Caltrans SDC requires the site be classified as Soil Type F. As required by SDC, a site response analysis must be performed for Soil Type F sites. Thus, we have performed a site response analysis based on the field investigations performed at the project site and the requirements set forth in Caltrans SDC and the results are provided in Appendix F.

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5 PRELIMINARY EVALUATIONS AND RECOMMENDATIONS

Geotechnical engineering discussions, conclusions, and preliminary recommendations for the type selection phase of the Camino Del Mar Bridge Replacement project are presented in the subsequent sections. These recommendations are consistent with the guidelines presented in Caltrans' Foundation Report Guidelines (Caltrans, 2017) and cover the preliminary geotechnical recommendations pertinent to the project for the bridge structure, including foundation recommendations and recommendations for the bridge approaches. Preliminary recommendations for geotechnical aspects of the project outside of the immediate bridge footprint are provided in the PGDR.

5.1 MATERIAL STRENGTH PARAMETERS

Material strength parameters were developed for engineering analyses including foundation design, retaining wall design, and global slope stability. Generalized soil engineering parameters and subsurface geometry used in the analyses were developed based on the results of our field and laboratory investigation, review of existing available information, and previous experience in the site vicinity. These generalized parameters were used for characterizing the subsurface at both abutments and pier locations. Ultimate and peak soil strengths were modeled using Mohr Coulomb failure criteria.

For the slope stability analyses, static, post-seismic, and rapid drawdown conditions used ultimate strengths in the analyses. For yield acceleration analyses, peak strengths were utilized for non-liquefiable layers. Liquefiable layers were modeled for yield acceleration and post-seismic conditions using the liquefied undrained residual shear strength in accordance with Caltrans' Memo to Designers 20-15 (Caltrans, 2017). Slope stability strength parameters are presented in Tables 8 and 9 for each case analyzed. Strength parameters used in the pile capacity analyses are provided in the calculations in Appendix G. The extents of each modeled layer are based on the geologic cross section provided in Figure 6 and as shown in the slope stability analysis results in Appendix G.

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Table 8

Strength Parameters for Static and Rapid Drawdown Analyses

Soil Description	Model	γ_{total} (pcf)	Static		Rapid Drawdown	
			c' / S_u (psf)	Φ' (deg)	c (psf)	Φ (deg)
Artificial Fill (af) (above water)	Mohr-Coulomb	120	50	33	50	33
Recent Alluvial Deposits (Qa) (Sand)	Mohr-Coulomb	120	50	28	50	28
Recent Alluvial Deposits (Qa) (Clay)	Undrained (Phi=0)	110	400	0	0	18
Young Alluvial Deposits (Qya) (Sand)	Mohr-Coulomb	125	50	32	50	32
Young Estuarine Deposits (Qyes) (Clay)	Undrained (Phi=0)	115	750	0	0	22
Old Alluvial Deposits (Qoa) (Sand)	Mohr-Coulomb	125	50	34	50	34
Old Alluvial Deposits (Qoa) (Dense Sand)	Mohr-Coulomb	130	50	36	50	36
Old Alluvial Deposits (Qoa) (Gravelly Sand)	Mohr-Coulomb	130	0	36	0	36
Del Mar Formation	Mohr-Coulomb	135	4,000	0	0	36

Table 9

Strength Parameters for Yield Acceleration and Post-Liquefaction Analyses

Soil Description	Model	γ_{total} (pcf)	Yield Acceleration Peak Strength		Post-Liquefaction Ultimate Strength		Residual Strength
			c' / S_u (psf)	Φ' (deg)	c' / S_u (psf)	Φ' (deg)	S_r (psf)
Artificial Fill (af) (above water)	Mohr-Coulomb	120	50	34	50	33	-
Recent Alluvial Deposits (Qa) (Sand)	Undrained (Phi = 0)	120	-	-	-	-	450
Recent Alluvial Deposits (Qa) (Clay)	Undrained (Phi=0)	110	400	0	400	0	-
Young Alluvial Deposits (Qya) (Sand)	Undrained (Phi = 0)	125	-	-	-	-	700
Young Estuarine Deposits (Qyes) (Clay)	Undrained (Phi=0)	115	750	0	750	0	-
Old Alluvial Deposits (Qoa) (Sand)	Mohr-Coulomb	125	50	35	50	34	-
Old Alluvial Deposits (Qoa) (Dense Sand)	Mohr-Coulomb	130	50	37	50	36	-
Old Alluvial Deposits (Qoa) (Gravelly Sand)	Mohr-Coulomb	130	0	37	0	36	-
Del Mar Formation	Mohr-Coulomb	135	4,000	0	4000	0	-

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5.2 BRIDGE FOUNDATIONS

For preliminary estimating purposes, Cast-In-Drilled-Hole (CIDH) type piles are recommended for the support of piers and abutments for the proposed replacement bridge. Based on the loose soil conditions and shallow groundwater at the site, it is recommended that permanent steel casing having a diameter of one foot larger than the diameter of the CIDH shaft and extending to the top of the Old Alluvium layer, or to approximate elevation -80 feet, be used for construction of CIDH piles. Steel casings are recommended in consideration of shaft constructability, liquefiable deposits, and liquefaction induced downdrag. The final casing tip elevation should be determined once further explorations have been made within the river channel.

As an alternative to CIDH piles, driven steel or concrete piles, including driven Cast-In-Steel-Shell (CISS) concrete piles, driven steel H-piles, driven steel pipe piles, and driven precast concrete piles, were also considered for support of the proposed bridge replacement. However, the ability to support large loads, obstructions during pile driving, localized settlements during to driving vibrations, and noise control were all considered as limitations for driven steel or concrete piles. For instance, based on our refusal of CPT-20-002A on gravels/cobbles within the river channel and the depositional environment of the San Dieguito River, obstructions from potential cobbles may interfere with the ability to drive piles. Additionally, the density of the Old Alluvial deposits and Del Mar Formation and the presence of the current timber piles from the existing bridge may also interfere with the drivability of driven piles. Furthermore, due to the proximity of the site to residential and recreational areas, noise from pile driving will likely be a concern during construction.

For type selection purposes, a summary of the preliminary axial capacity analyses for the abutments and various pier options are provided in the subsequent section below and the results of our pile capacity analyses are provided in Appendix G.

5.2.1 Axial Resistance

The compressive axial capacity analysis for CIDH shafts was completed in accordance with the AASHTO LRFD Bridge Design Specifications with California Amendments (8th Edition) using the computer program SHAFT by Ensoft. A LRFD factor of 0.7 was applied to nominal compressive shaft side resistance for calculating the factored shaft side resistance for the strength limit state. A LRFD factor of 1.0 was used for the extreme event loads. Due to the wet pile installation conditions and anticipated depths of the pile tips, tip resistance is ignored for the preliminary analyses.

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Use of partial tip resistance based on load-settlement calculations can be considered during the detailed design phase if additional resistance is required. If substantial tip resistance is necessary for the proposed piles, post-grouting of the pile tips and load testing should be considered. Post-grouted piles are recommended to be load tested using the Osterberg Load Cell™ or Statnamic™ techniques to verify the end bearing resistance. The possible need for end bearing and the economic and construction feasibility of tip post-grouting and load testing should be discussed by the project design team and the client once the final bridge type is selected. If tip resistance is necessary, Kleinfelder can provide these values in the final foundation report.

Based on the request of the bridge designer, we have performed compressive axial pile capacity analyses for 5-ft-diameter CIDH shafts with 6-ft-diameter permanent steel casings for support of the proposed abutments. For the piers, we performed compressive pile capacity analyses for 6-ft-diameter, 9-ft-diameter, and 10-ft-diameter CIDH shafts each having permanent steel casings one foot larger than the shaft. Based on discussions with the project team, we understand that adequate space to provide pile spacings of at least three diameters on-center may be provided for these pile options with the exception of the 6-ft-diameter CIDH shafts for support of the piers. For this option, we have considered group effects using a pile spacing of 2.8 diameters on-center.

Furthermore, due to the use of smooth-walled permanent steel casing which is recommended to be installed by an oscillator/rotator, the geotechnical side resistance of the cased portion of the CIDH pile is ignored in accordance with Caltrans' Guidelines for Foundation Reports for Bridges (Caltrans, 2017). As the permanent casing is proposed to extend below the potentially liquefiable layers at the site and considering the annular space between the casing and the pile, downdrag loads due to liquefaction are not expected to be transferred to the pile. Therefore, liquefaction induced downdrag were also ignored. Scour was considered in the analysis; however, the depth of the permanent steel casing extends below the estimated total scour elevations.

Preliminary CIDH axial pile capacity charts as a function of depth for the abutment piles and various pier pile alternatives are provided in Appendix G. Appendix G also includes tables of the soil engineering properties used in the capacity analyses as well as the SHAFT output files.

Preliminary compression loads provided by the bridge engineer for the Type Selection Phase generally range from 2,000 kips to 3,800 kips per pile at the piers and 1,000 kips to 1,100 kips per pile at the abutments, dependent on the bridge option. Based on these preliminary compressive loads, the preliminary pile tip elevations for type selection purposes of the various bridge options are anticipated to range from -167 ft to -172 ft at the piers and -129 ft to -132 ft at

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the abutments. Once final loads are determined for the selected bridge type, final pile tip elevations will be established.

5.3 ABUTMENTS

Based on conversations with the design team, we understand that the abutments at the north and south abutment will be non-integral seat-type abutments and will extend to approximate elevations +7 feet and +5½ feet, respectively. Preliminary recommendations for the abutment walls are provided in the subsequent sections. These recommendations should be updated once the final abutment configurations have been established.

5.3.1 Lateral Earth Pressures

We recommended that the abutments be backfilled with Caltrans structural backfill and be designed with the following soil parameters per Caltrans Standard Plans (Caltrans, 2018) and Caltrans Memo to Designers 5-5 (Caltrans, 2014):

- Total unit weight: 120 pcf
- Internal friction angle: 34°
- Cohesion: 0 psf
- Horizontal seismic coefficient: 0.2g
- Vertical seismic coefficient: 0.0g

The abutments backfilled with Caltrans structural backfill should be designed to resist an active equivalent fluid earth pressure of 35 pcf for drained conditions and 80 pcf for undrained conditions. The active equivalent earth pressure assumes the wall is free to rotate at least 0.002 times the height of the wall to mobilize the active condition. If the abutments are restrained against movement at the top, they should be designed using the at-rest equivalent fluid earth pressure of 55 pcf for drained conditions and 90 pcf for undrained conditions. These pressures include hydrostatic pressure for undrained conditions and assume level backfill conditions.

Resistance to horizontal loadings can be developed by passive earth pressure using a factored equivalent fluid weight of 450 pcf for drained conditions and 250 pcf for undrained conditions (includes hydrostatic pressure). These passive pressures include a resistance factor of 0.5 in accordance with AASHTO LRFD BDS. The passive pressure should be ignored within the scour/erosion depth of the abutment if applicable.

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We preliminarily recommend a design groundwater elevation of +6 feet for design of the retaining walls assuming adequate drainage is provided above this elevation. If the bottoms of the abutment walls are designed to bear at an elevation lower than +6 feet, or if adequate drainage is not provided above this elevation, then the abutment walls should also be designed for hydrostatic pressures. Surcharge pressures (dead or live) should be added to the lateral pressures where such loads (e.g., traffic) may occur adjacent to the wall and should be estimated by multiplying the surcharge load by the active earth pressure coefficient (K_a) of 0.29 or the at-rest earth pressure coefficient (K_o) of 0.45, whichever is applicable.

Seismic wall pressures were estimated using the Monokobe-Okabe method (AASHTO, 2017) assuming level backfill conditions. Based on the design peak horizontal ground acceleration of 0.2g per Caltrans standards, the resultant seismic force (in pounds) for each linear foot of wall in terms of equivalent fluid weight can be estimated as $17.5H^2$ pcf within Caltrans structural fill soils, where H is the height of the wall (in feet) above its base. The resultant seismic force acts at 0.5H above the wall base in accordance with Caltrans MTD 5-5. This dynamic incremental earth pressure should be added to the static active earth pressure.

5.3.2 Slope Stability and Seismic Slope Displacements at Abutments

Limit equilibrium slope stability analyses were performed at the abutments using the computer program Slope/W by Geo-Slope International. Spencer's method of slices was selected for the slope stability analyses as this method satisfies both moment and force equilibrium. The analysis employed circular critical slip surface search routines. Analyses were performed for short-term and long-term static conditions, post-seismic conditions, and rapid drawdown conditions. The required minimum factors of safety for each condition are provided in Table 10. Analyses were also performed for yield acceleration (seismic) conditions in which seismic coefficient values corresponding to a factor of safety of 1.0 were determined in order to estimate seismic slope displacements at the abutments.

Table 10

Required Minimum Factors of Safety for Global Stability Analyses

Analysis Type	Minimum Factor of Safety
Static Short-Term	1.3
Static Long-Term	1.5

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Table 10 (Continued)

Required Minimum Factors of Safety for Global Stability Analyses

Analysis Type	Minimum Factor of Safety
Post-Liquefaction	1.1
Rapid Drawdown	1.1

The slopes at the abutments were modeled without the abutment wall to analyze short-term construction conditions. Long-term static conditions were modeled with the abutment wall. The effect of restraining forces provided by the proposed pile foundations are not included in the current analyses and, therefore, they are considered “free-field” analyses.

For all cases, a 250 psf surcharge load was modeled to account for traffic loading. Liquefied strengths were used in the yield acceleration and post-liquefaction models in accordance with Caltrans guidelines. No seismic loading (i.e. no horizontal seismic coefficient, k_h) was applied in the post-liquefaction analyses assuming liquefaction occurs subsequent to seismic ground shaking. For the yield acceleration analyses, seismic loading was applied so that the resulting factor of safety is equivalent to 1.0. This seismic loading is designated as the yield coefficient, k_y, and was used along with the dynamic characteristics of the slope/slide mass and design spectral accelerations to estimate the residual seismic slope displacements.

For the rapid drawdown condition, the site’s design storm water level of approximate elevation +14.55 feet was used as the pre-drawdown groundwater condition. Rapid drawdown was performed to model drawdown of the surficial water within the river channel to the ground surface. Using these conditions for our analyses, Table 11 summarizes the resulting critical slope stability safety factors for the static analyses performed and Table 12 summarizes the yield coefficient results.

Table 11

Preliminary Results of Static Slope Stability Analyses

Case		Critical Factor of Safety
Static Short-Term	North Abutment	1.616
	South Abutment	1.515
Static Long-Term	North Abutment	1.861

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Table 11 (Continued)

Preliminary Results of Static Slope Stability Analyses

Case		Critical Factor of Safety
	South Abutment	3.014
Post-Liquefaction	North Abutment	1.202
	South Abutment	1.363
Rapid Drawdown	North Abutment	1.480
	South Abutment	2.195

Table 12

Preliminary Results of Yield Acceleration Slope Stability Analyses

Case		Yield Coefficient
Yield-Acceleration	North Abutment	0.049g
	South Abutment	0.072g

Based on the critical safety factors as provided in Table 11, the proposed abutment slopes appear to have adequate static short-term and long-term stability and adequate stability against rapid drawdown using the design storm water elevation. Furthermore, using the residual strength parameters, the proposed abutments also appear to have adequate post-liquefaction stability against flow failure.

For the yield acceleration condition, seismic slope displacements were estimated at the abutments using the yield coefficient values shown in Table 12, the site's seismic design response spectrum as provided in Appendix F, and the method of Bray and Travasarou (2007) in accordance with Caltrans' Memo to Designers 20-15 (Caltrans, 2017). Based on the Bray and Travasarou (2007) method and the site's seismic parameters, the median seismic slope displacements were estimated to be approximately 2 feet at the southern abutment and 3.2 feet at the northern abutment during design level ground shaking. The spectral accelerations for the design level ground shaking used in the seismic slope displacement estimates were based on the preliminary acceleration response spectrum as discussed in Section 4.2 of this report. It should be noted that there is inherent uncertainty in seismic slope displacement estimates. The likely range of displacements is approximately one-half to two times the median value.

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Displacements of this magnitude may or may not require mitigation. Slope displacements are expected be resisted by the proposed foundations at the abutments and the resulting displacements would be less than the estimates for a free-field condition. If these slope displacements are too large to currently design to, and once type selection is finalized, the bridge designer should analyze and develop the restraining forces of the piles at the abutments in accordance with Caltrans' Memo to Designers 20-15 (Caltrans, 2017) so that updated lateral displacements considering the proposed foundations can be estimated.

The various slope stability models, resulting failure surfaces and critical safety factors, and the seismic slope displacement calculations are provided in Appendix G.

5.4 BRIDGE APPROACHES

5.4.1 Approach Fill Settlement

Based on preliminary civil plans and discussions with the project team, we understand that several approach fill profiles are currently under consideration at this phase of the project. Based on the conceptual grading profiles for the bridge approaches and the subsurface conditions at the site, we anticipate minimal static settlement due to the new approach fills. Furthermore, due to the granular soils within the zone of influence below the approach embankments, a majority of the static settlements are anticipated to occur during fill placement and compaction and very little static settlement is expected after construction activities. Once the final grading profiles have been established, bridge approach settlements due to placement of new approach fills should be evaluated.

Liquefaction-induced settlements of between 3 and 7 inches along the approaches may occur during a seismic event as discussed in Section 4.1.2 of this report. This should be considered a maintenance issue and should be included as an item for post-earthquake inspection and repair.

5.4.2 Approach Retaining Walls

At this phase of the project, we understand that the retaining wall type and dimensions have not yet been determined. However, based on conversations with the design team, we understand that consideration is being given for a Caltrans Standard reinforced concrete cantilever type wall along the bridge approaches. We have provided preliminary design recommendations for this Caltrans Standard type wall anticipated along the bridge approaches. These recommendations should be updated once the final wall type and dimensions have been established.

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5.4.2.1 Foundations

Retaining walls may be supported on shallow continuous foundations supported on improved ground to mitigate liquefaction and lateral spreading or on deep foundations designed to resist lateral spreading forces.

Retaining walls with shallow continuous foundations designed in accordance with the Caltrans Standard Plans (Caltrans, 2018) were evaluated for bearing resistances. Bearing resistances are expected to meet the load demands provided wall foundations are supported on at least 3 feet of compacted Caltrans Standard fill as the friction angle for Caltrans Standard fill and the existing fill soils are estimated to be greater than 30 degrees and the PGA at the site is less than 0.6g.

However, due to the underlying liquefiable deposits and estimated liquefaction induced settlements of 3 to 7 inches in addition to about 21 to 30 inches of settlement associated with the seismic displacement of slopes (about two-thirds of estimated seismic slope displacements), ground improvement or deep foundations are recommended for the support of retaining walls to be able to resist the liquefaction induced displacements.

Ground improvement methods to increase the strength of the soil susceptible to liquefaction and lateral spreading may include deep soil mixing, compaction grouting, jet grouting, vibro-compaction, or rigid inclusions. We anticipate the depth of ground improvement should likely be deeper than a minimum of 30 feet to mitigate for lateral spreading potential.

Should shallow foundations with ground improvement be used for support of approach retaining walls, foundations should have a minimum width in accordance with Caltrans Standard Plans and based on the structural stability analyses performed by the wall designer. Retaining wall foundations should be embedded at least 1½ feet below the lowest adjacent grade or to the depth necessary to provide adequate factors of safety against sliding and overturning as determined by the retaining wall designer, whichever is greater. Shallow foundations for retaining walls embedded near slopes may also experience a reduction in bearing capacity and should be embedded deep enough to provide an adequate daylight distance to nearby slopes.

Alternatively, deep foundations such as CIDH piles can be considered for the support of retaining walls. The piles should be sized to provide adequate restraining forces against lateral spreading displacements. If deep foundations are selected to mitigate the liquefaction and lateral spreading hazard for the approach retaining walls, the structural designer should analyze and develop the restraining forces of the piles supporting the retaining walls in accordance with Caltrans' Memo to Designers 20-15 (Caltrans, 2017) so that updated lateral displacements and associated vertical

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settlements considering the proposed foundations can be estimated. Based on the anticipated approach fill and retaining wall heights, embedment depth of the piles are expected to be in the range of 30 to 40 feet to mitigate lateral spreading hazard for the retaining walls.

Once the final wall type and dimensions have been determined, foundation options should be re-evaluated and designed accordingly per Caltrans standards considering the seismic hazards at the site.

5.4.2.2 Retaining Wall Global Stability

Based on discussions with the project team and the conceptual plans, we understand that various grade profiles and wall dimensions are currently under consideration and that final grades for the embankment slopes extending from the roadway to the beach areas along the embankments have not yet been determined. We anticipate the global stability of the proposed Caltrans Standard walls will be considered stable with the use of ground improvement and adequate foundation embedment, however, analyses should be performed to confirm the global stability of the wall system once the final civil profile, slope grades, and wall type and dimensions have been determined.

We have performed limit equilibrium slope stability analyses for the bridge abutment walls/slopes as provided in Section 5.3 of this report. These slope stability analyses the critical stability sections of the wall/bridge system.

5.5 TEMPORARY EXCAVATIONS AND SHORING

5.5.1 Temporary Piles

We understand that temporary trestle bridges are proposed for installation of the CIDH piles for the replacement bridge. The trestle bridges will need to be supported on temporary piles capable of supporting construction loads from the pile drill rig, oscillator, crane, etc. We understand that the trestle bridge piles have not yet been selected but are being considered for cost estimates during the type selection phase.

Possible pile types suitable for supporting the temporary trestle bridges include driven steel H-piles or pipe piles as well as driven CISS concrete piles. Driven piles have the advantage of fast installation times, are generally cost effective, can be installed to relatively deep depths, and generally generate minimal spoils. However, noise control is a concern for driven piles due to the proximity of the site to residential areas. Localized settlements of the loose, granular soils

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supporting nearby structures during pile driving is also a concern while keeping existing structures in service dependent on the location of the temporary piles relative to the existing bridge. Furthermore, based on our refusal of CPT-20-002A on gravels/cobbles within the river channel and the depositional environment of the San Dieguito River, obstructions from potential cobbles may interfere with the ability to drive piles for the temporary trestle bridges.

As noise control is necessary during installation of temporary piles and driving ability due to potential settlement issues and obstructions are concerns for the temporary trestle bridge piles, helical or screw piles may also be considered. These piles consist of steel and are augered/screwed into the ground. They are ideal for temporary structures as they are easily removed by reversing the installed rotation process. However, helical/screw piles typically have shallower installation lengths and lower capacities which may result in a higher number of required temporary piles.

Temporary piles for trestle bridges are typically designed by the contractor. Kleinfelder should review any temporary pile designs to confirm adequate safety factors are achieved for the selected temporary piles based on the construction loads.

5.5.2 Temporary Shoring

Based on conversations with the design team, we understand that portions of the existing abutments will remain in place to help with temporary excavation support, in addition to scour protection. Additional temporary shoring support may be required for construction of the abutments or possibly for installation of the embankment retaining walls or relocation of existing utilities.

Temporary shoring design should be performed by a Registered Professional Engineer. Temporary shoring may consist of sheet piles, shore boxes, soldier piles and lagging, secant piles, etc. If excavations extend below the groundwater table, the shoring design should consider possible dewatering methods or, if dewatering is not possible, the shoring type should be selected and designed to resist hydrostatic pressures.

Where shoring or excavation is performed next to sensitive structures or utilities, instrumentation should be installed to monitor displacements. The final shoring designs should be reviewed by Kleinfelder.

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5.6 ADDITIONAL GEOTECHNICAL INVESTIGATIONS

The recommendations provided in this preliminary geotechnical design report are based on the currently available preliminary plans, our available information review, geotechnical field investigation, and our understanding of the proposed project. We recommend that an additional geotechnical investigation be completed at the site once the final bridge type has been selected and the alignment design plans, profiles and cross-sections are developed. Depending on the location and height of fills, retaining walls, bridge piers and abutments, and any other improvements, additional explorations may be required. Based on any additional explorations, our preliminary observations and recommendations should be updated, and final geotechnical recommendations should be prepared for the project. We recommend the additional geotechnical investigation should include the following:

- Additional exploratory borings and/or CPTs located at each proposed pier location. The additional explorations should be advanced deep enough to appropriately evaluate the subsurface conditions for purposes of foundation design based on the preliminary foundation recommendations provided in the PFR. It should be noted that a CPT was attempted at the central portion of the existing bridge and early refusal on gravel and cobbles was encountered. This, along with environmental and permitting restrictions, should be considered during the planning of future explorations within the river channel.
- Additional laboratory testing of collected soil samples to provide final geotechnical design parameters for proper foundation, abutment wall, approach retaining wall, and pavement design.

Final geotechnical design analyses should be completed for the Camino Del Mar Bridge Replacement project in order to provide recommendations for the finalized bridge type and configuration. The analyses should be conducted to confirm our preliminary recommendations and provide updated recommendations in a final foundation report.

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6 LIMITATIONS

This report has been prepared for the exclusive use of the City of Del Mar and their consultants for specific application to the design and construction of the Camino Del Mar Bridge Replacement project. The findings, conclusions, and recommendations presented in this report were prepared in accordance with generally accepted geotechnical engineering practice. No warranty, express, or implied is made.

The scope of services was limited to the field exploration program described in this report. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies.

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining the level of service necessary to provide information for their project at an acceptable level of risk. The client and key members of the design team should discuss the issues addressed in this report with Kleinfelder so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk, and expectations for future performance and maintenance.

Conclusions and recommendations contained in this report are based on our field observations and subsurface explorations, laboratory tests, engineering analyses, and our understanding of the proposed construction. It is possible that soil or groundwater conditions could vary between or beyond the points explored. If soil or groundwater conditions are encountered during construction that differ from those described herein, then the client is responsible for ensuring that Kleinfelder is notified immediately so that we may re-evaluate the conclusions and recommendations of this report. If the scope of the proposed construction, or locations of the improvements, changes from that described in this report, the conclusions and recommendations contained in this report are not considered valid until the changes are reviewed and the conclusions of this report are modified or approved in writing by Kleinfelder.

Kleinfelder cannot be responsible for interpretation by others of this report or the conditions encountered in the field. Kleinfelder should be retained so that all geotechnical aspects of construction will be monitored on a full-time basis by a representative from Kleinfelder, including but not limited to site preparation, preparation of foundations, and placement of engineered fill. These services provide Kleinfelder the opportunity to observe the actual soil and groundwater

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conditions encountered during construction and to evaluate the applicability of the recommendations presented in this report to the site conditions. If Kleinfelder is not retained to provide these services, we will cease to be the engineer of record for this project and will assume no responsibility for any potential claim during or after construction on this project. If changed site conditions affect the recommendations presented herein, then Kleinfelder must also be retained to perform a supplemental evaluation and to issue a revision to our report.

This report, and any future addenda or reports regarding this site, may be made available to bidders to supply them with only the data contained in the report regarding subsurface conditions and laboratory test results at the point and time noted. Bidders may not rely on interpretations, opinions, recommendations, or conclusions contained in the report. Due to the limited nature of any subsurface study, the contractor may encounter conditions during construction which differ from those presented in this report. In such event, the contractor should promptly notify the owner so that Kleinfelder can be contacted to confirm those conditions. We recommend contingency funds be reserved for potential problems during earthwork and foundation construction.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance, but in no event later than one year from the date of the report. Land use, site conditions (both on and off site), or other factors may change over time and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

Our geotechnical scope of services for this subsurface exploration and preliminary geotechnical design report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances at this site. Kleinfelder will assume no responsibility or liability whatsoever for any claim, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site or from the discovery of such hazardous materials. Additional important information about this report is presented in the attached Geotechnical Business Council insert in Appendix H.

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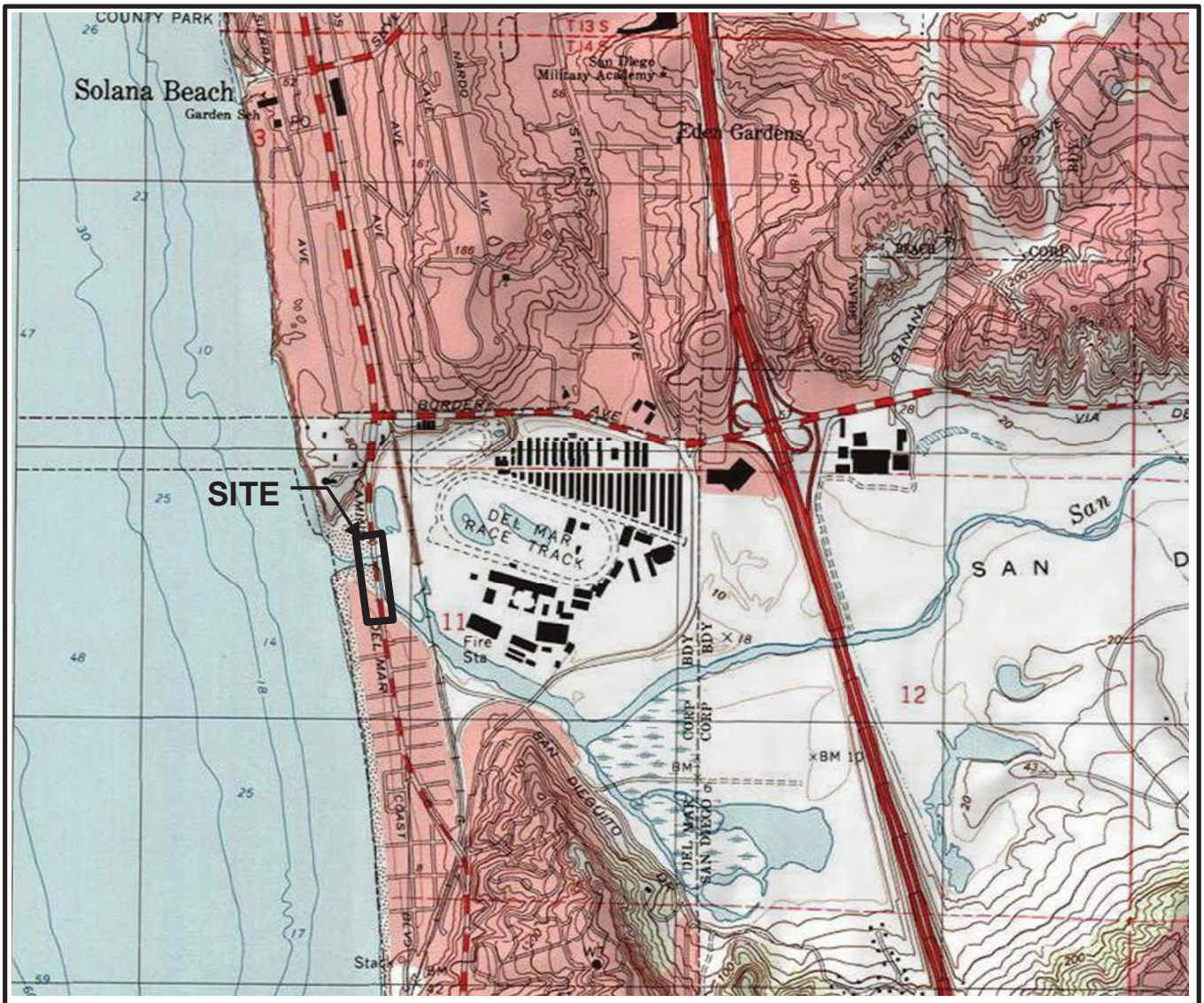
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FIGURES

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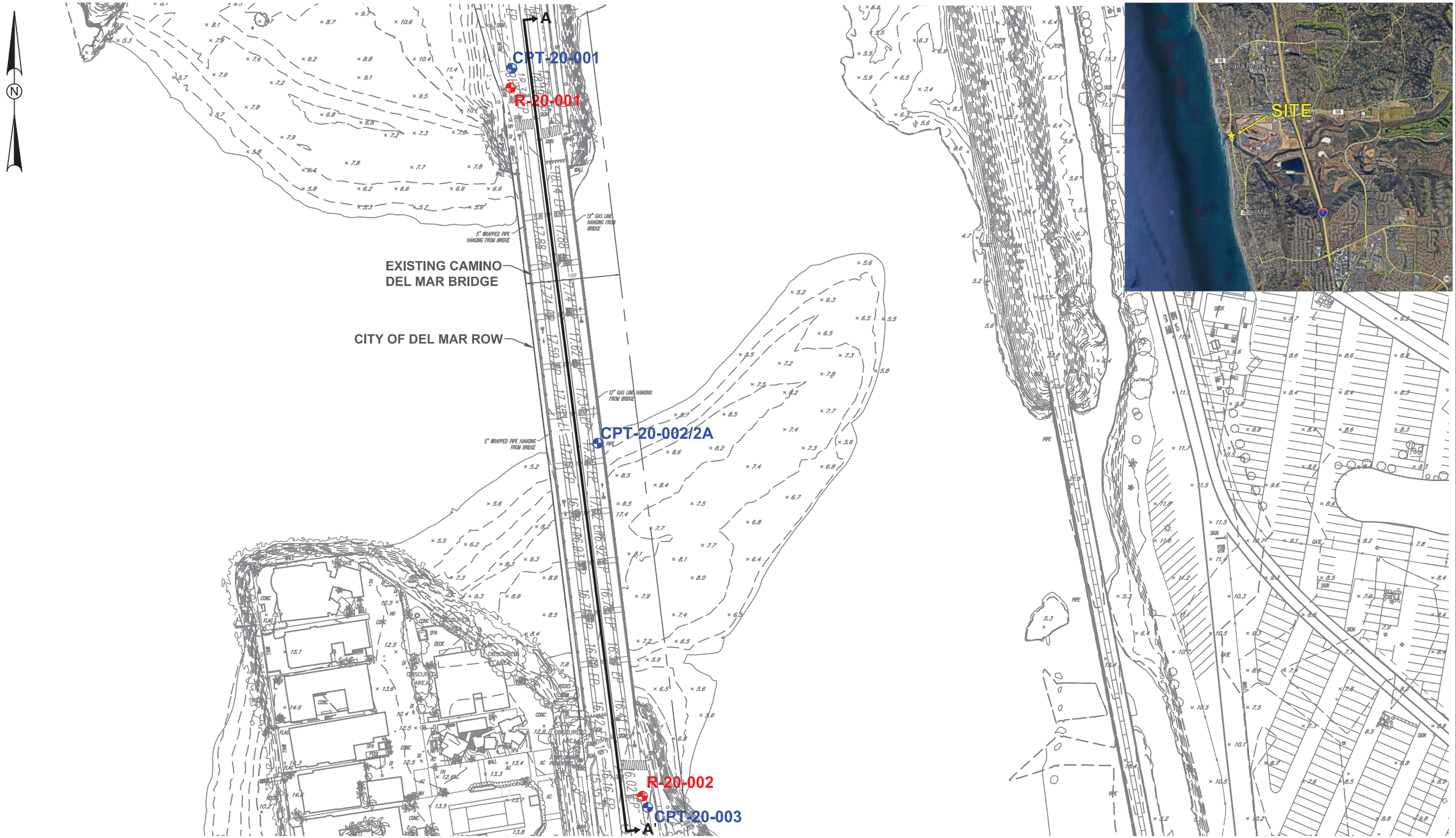
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SITE VICINITY MAP

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
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NOTES:

1. EXISTING CONDITIONS REFERENCED FROM THE TOPOGRAPHIC SURVEY PREPARED BY SAMPO ENGINEERING, INC. DATED APRIL 13, 2018.

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SCALE: 1" = 100'

100 50 0 100 200

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PROJECT NO.	20180876
DRAWN BY	JLB
CHECKED BY	RAT
DATE:	04/2019
REVISED:	-

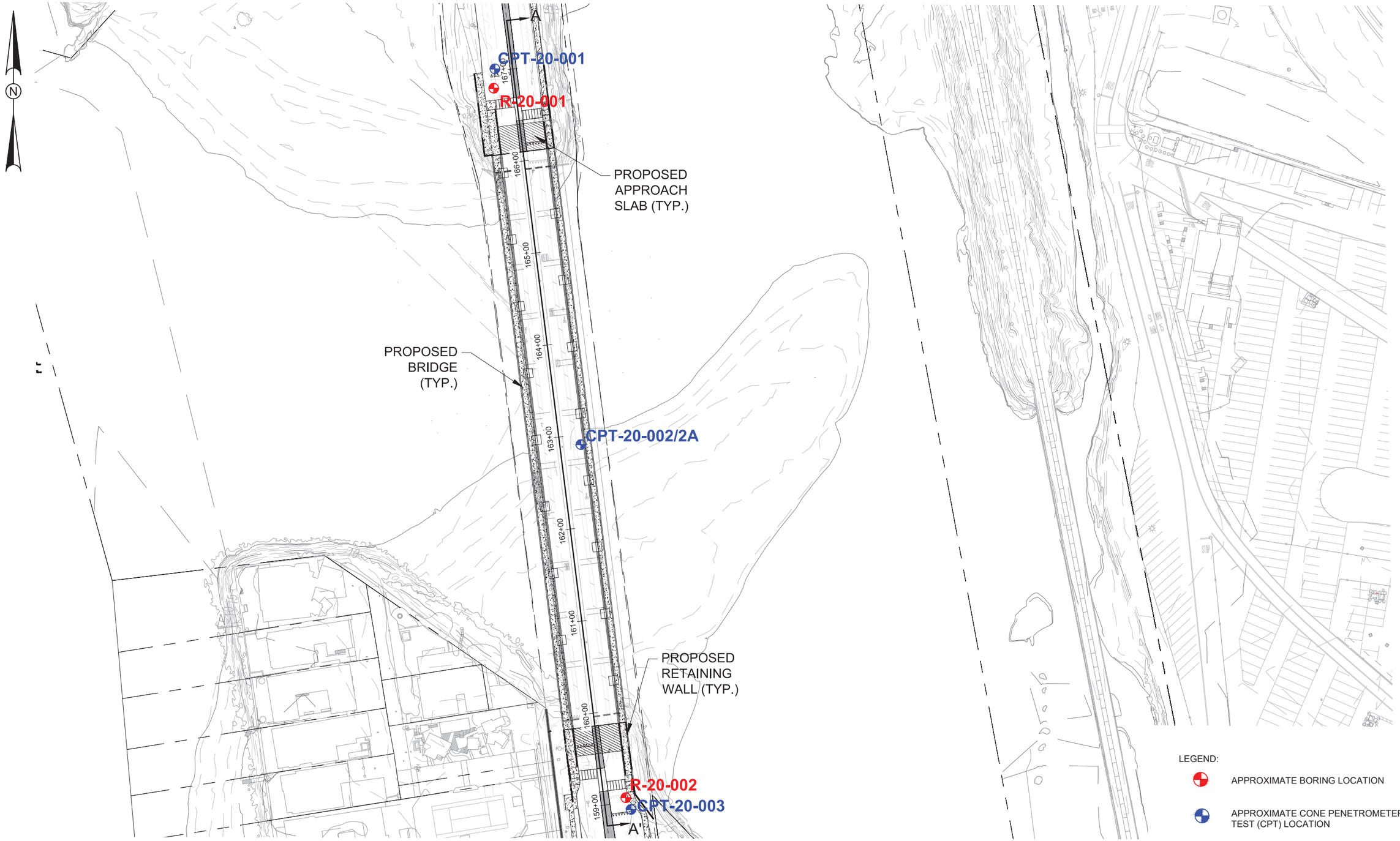
SITE AND PHASE 0 EXPLORATION LOCATION PLAN

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
2

PLOTTED: 4/7/2020 12:15 PM BY: janna bonfiglio
CAD FILE: C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Resources For Section\Del Mar Bridge TOPO.dwg LAYOUT: Layout1 (2)

PLOTTED: 5/28/2020 5:56 PM BY: janna.bonfiglio
CAD FILE: C:\Users\lBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Camino Del Mar Bridge Plan & Profile - Standard 05192020\Camino Del Mar Bridge Plan & Profile.dwg LAYOUT: Layout1



NOTES:
1. EXISTING CONDITIONS REFERENCED FROM THE TOPOGRAPHIC SURVEY PREPARED BY SAMPO ENGINEERING, INC. DATED APRIL 13, 2018.
2. PROPOSED CONDITIONS REFERENCED FROM THE SITE PLAN PREPARED BY KLEINFELDER, INC. DATED MAY 19, 2020.

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SCALE: 1" = 100'

100 50 0 100 200

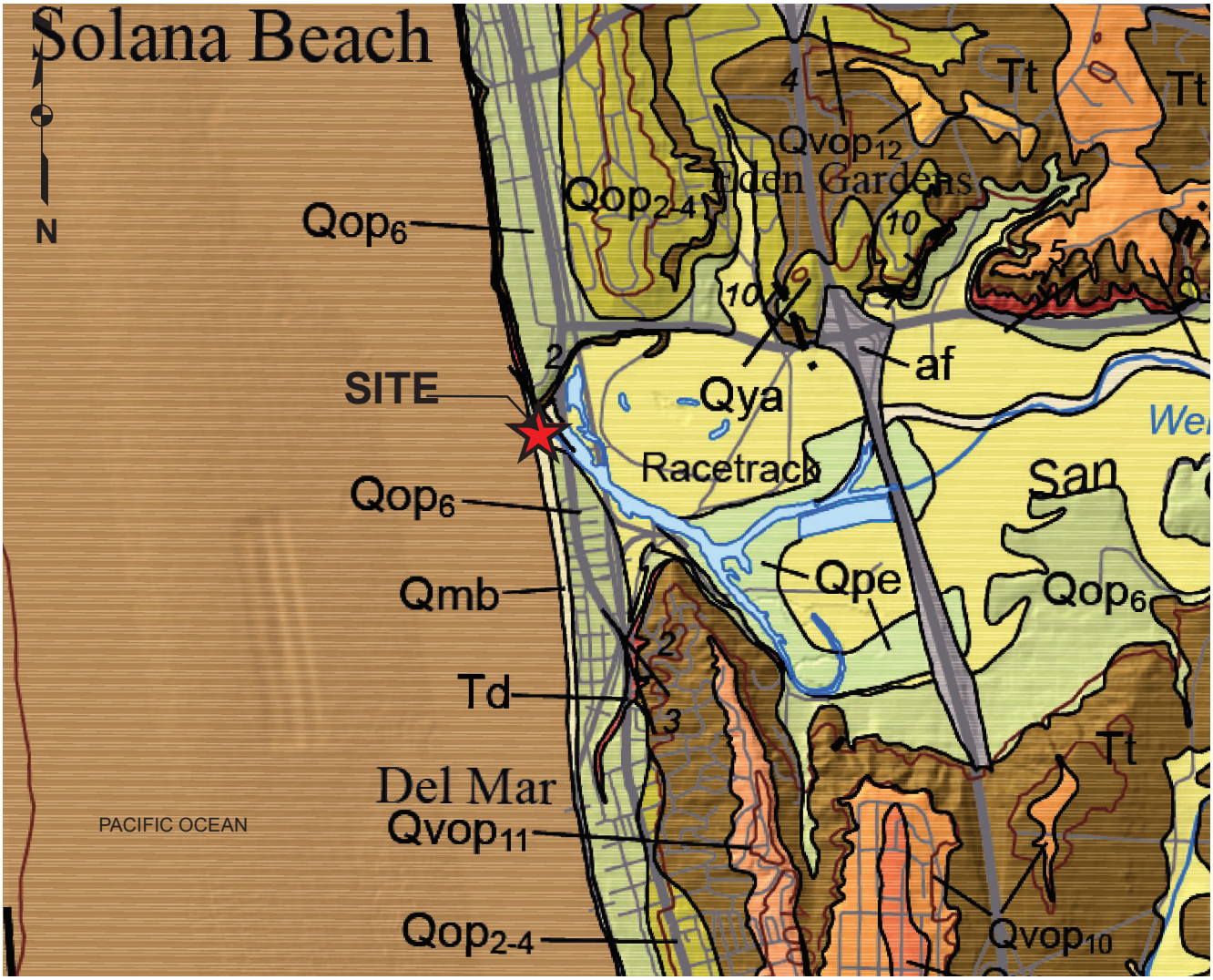
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PROJECT NO.	20180876
DRAWN BY	JLB
CHECKED BY	KR
DATE:	05/2020
REVISED:	-

PROPOSED CONDITIONS AND PHASE 0 EXPLORATION LOCATION PLAN

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
3



LEGEND

- af - ARTIFICIAL FILL
- Qmb - MARINE BEACH DEPOSITS
- Qya - YOUNG ALLUVIAL FLOOD-PLAIN DEPOSITS
- Qop_6 - OLD PARALIC DEPOSITS, UNDIVIDED, UNIT 6
- Qop_{2-4} - OLD PARALIC DEPOSITS, UNDIVIDED, UNITS 2-4
- Qop_{11} - OLD PARALIC DEPOSITS, UNDIVIDED, UNIT 11
- Qop_{10} - OLD PARALIC DEPOSITS, UNDIVIDED, UNIT 10
- Qop_{10a} - OLD PARALIC DEPOSITS, UNDIVIDED, UNIT 10a
- Qop_{12} - OLD PARALIC DEPOSITS, UNDIVIDED, UNIT 12
- Td - DELMAR FORMATION
- Tt - TORREY SANDSTONE

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0 1,000 2,000 4,000 6,000 Feet

SOURCE:
GEOLOGIC MAP OF THE SAN DIEGO 30' X 60' QUADRANGLE, CALIFORNIA, BY KENNEDY AND TAN, 2008.

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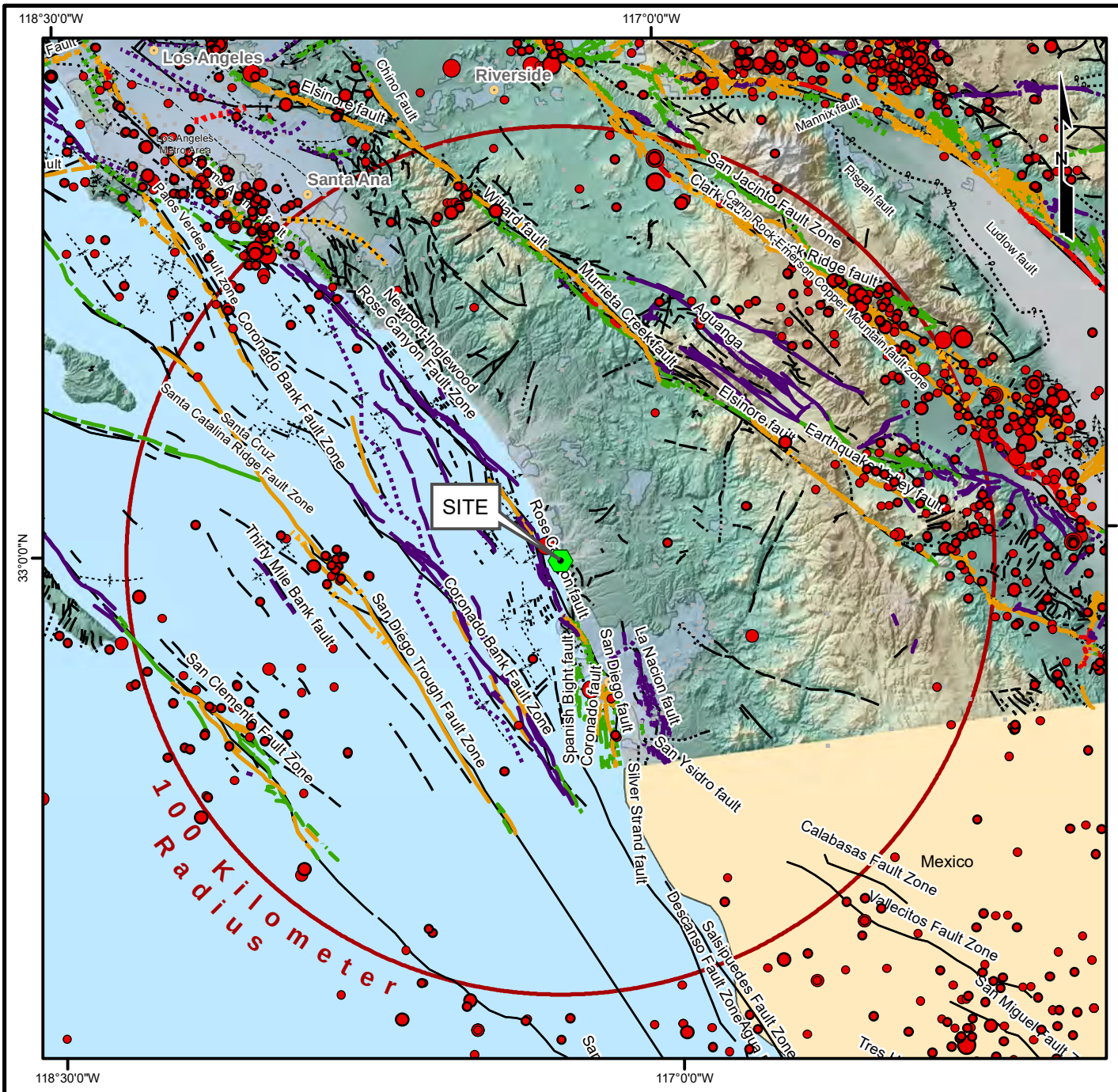
PROJECT NO.	20191449
DRAWN:	12/26/2019
DRAWN BY:	JP
CHECKED BY:	JB
FILE NAME:	Geo Map.mxd

REGIONAL GEOLOGIC MAP

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
4

\\sandiego\swe-data\G\Bridge Division\Job Files\03 FY2018\0876 - Camino Del Mar Bridge Replacement\Phase B- PAED\Geotech\Deliverables\Figures\Figure 3_Geo Map.mxd



Faulting Legend

Quaternary Faults (Bryant, 2005; USGS, 2018)

Historic displacement (< 150 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Late Quaternary displacement (< 750,000 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Holocene displacement (< 15,000 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Quaternary & unspecified displacement (< 1,600,000 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Pre-Quaternary Geologic Structures (CGS, 2000)
- fault, approx. located
- fault, approx. located, queried
- fault, certain
- fault, concealed
- fault, concealed, queried
- fault, inferred, queried

ANSS Earthquakes

Magnitude
- 4.0 - 4.9
- 5.0 - 5.9
- 6.0 - 6.9
- 7.0 - 7.9
- 8.0 - 8.9

35 17.5 0 35 Kilometers

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PROJECT NO.	20180876
DRAWN:	12/26/2019
DRAWN BY:	JB
CHECKED BY:	KR
FILE NAME:	EQ Map.MXD

REGIONAL FAULT MAP AND EARTHQUAKE EPICENTERS (1800 - JULY 2019)

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
5

\\sandiegolswe-data\G\Bridge Division\Job Files\03 FY20180876 - Camino Del Mar Bridge Replacement\Phase B- PAED\Geotech\Deliverables\Figures\Figure 4_EQ Map.mxd

PLOTTED: 6/1/2020 9:25 AM BY: janet patay
CAD FILE: \\sandiego\sandiego-data\GRAPHICS\..clients\CityOfDelMar\20180876\dwg\Del Mar Bridge TOPO.dwg LAYOUT: Layout1 (2)

NORTH

NORTH

SOUTH

APPROXIMATE EXTENTS OF PROPOSED BRIDGE

EXISTING GROUND SURFACE

CPT-20-001 (PROJECTED 18' WEST)

R-20-001 (PROJECTED 21' WEST)

PROPOSED BRIDGE PROFILE

CPT-20-002/2A (PROJECTED 23' EAST)

R-20-002 (PROJECTED 22' EAST)

CPT-20-003 PROJECTED 26' EAST)

ELEVATION (FEET, NAVD88)

af

ABUTMENT 7

PIER 6

PIER 5

PIER 4

PIER 3

PIER 2

ABUTMENT 1

Qa

Qya

Qyes

Qoa

Td

TD=151.0'

TD=208.0'

GEOLOGIC CROSS SECTION STATIONING

BRIDGE STATIONING

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00

167+00 166+00 165+00 164+00 163+00 162+00 161+00 160+00 159+00

LEGEND

- ARTIFICIAL FILL
- RECENT ALLUVIAL DEPOSITS
- YOUNG ALLUVIAL DEPOSITS
- YOUNG ESTAURINE DEPOSITS
- OLD ALLUVIAL DEPOSITS
- **Td** DEL MAR FORMATION
- APPROXIMATE GEOLOGIC CONTACT, QUERIED WHERE UNCERTAIN

CPT-20-003 (PROJECTED 28' EAST)

CPT LOCATION WITH TIP RESISTANCE (RIGHT SIDE) AND FRICTION RESISTANCE (LEFT SIDE) PROFILES, SHOWING PROJECTION AND TOTAL CPT DEPTH

R-20-002 (PROJECTED 22' EAST)

5,4,7
5,5,5
3,3,1

TD = 208.3'

BORING LOCATION WITH GRAPHIC LOG AND N-VALUES, SHOWING PROJECTION AND TOTAL BORING DEPTH (N = Blows/Foot for bot□Cal and SPT samples - see Boring logs in report for sample types and description of grap□ic symbols)

REFER TO FIGURES A-1 AND A-2 IN APPENDIX A FOR FURTHER EXPLANATION OF BORING LOGS

GROUNDWATER LEVEL DURING DRILLING

GROUNDWATER LEVEL AFTER DRILLING

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NOTE:
1. EXISTING CONDITIONS REFERENCED FROM THE TOPOGRAPHIC SURVEY PREPARED BY SAMPO ENGINEERING, INC. DATED APRIL 13, 2018.

60 30 0 60
SCALE (FEET)

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PROJECT NO.	20180876
DRAWN BY	JLB/JSP
CHECKED BY	SR
DATE:	06/2020
REVISED:	-

GEOLOGIC CROSS-SECTION A-A'

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
6

APPENDIX A
BOREHOLE LOGS

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APPENDIX A
BOREHOLE LOGS

The geotechnical borehole explorations for the project consisted of drilling and logging two borings, designated as R-20-001 and R-20-002, advanced by Pacific Drilling of San Diego, California. The borings were drilled using a truck-mounted drill rig between February 10th and 21st, 2020. The borings were advanced to depths of approximately 151 and 208 feet below ground surface, respectively, using 8-inch outer-diameter hollow-stem augers and a 4-inch-diameter tri-cone roller bit with the rotary wash method. The approximate locations of the boreholes are presented in Figures 2 and 3.

A Unified Soil Classification System (USCS) chart, graphics key, and borehole log legend are presented in Appendix A in addition to the borehole logs. The borehole logs describe the earth materials encountered, samples obtained, and show results of field and select laboratory tests. The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

The boreholes were logged by our field engineer who collected bulk and intact samples of encountered materials for further evaluation and laboratory testing. In-place soil samples were obtained at the test boring locations using a Standard Penetration Test (SPT) or California-type Samplers driven a total of 18 inches (or until practical refusal) into the undisturbed soil at the bottom of the borehole. The soil sampled by the SPT (2-inch outer diameter) or California-type sampler (3-inch outer diameter) was returned to our laboratory for testing. The samplers and associated rods were driven using a 140-pound automatic hammer falling a distance of 30 inches. The number of hammer blows to drive the samplers every 6 inches is recorded on the boring logs. The total number of hammer blows required to drive the sampler the final 12 inches is termed the blow count (or N-value). The blow count values are the field values and have not been corrected for effects such as overburden pressure, sampler size, sample depth, hammer efficiency, etc. on the boring logs.

Prior to drilling of the borings, a utility mark-out was performed by Southwest Geophysics using various geophysical survey equipment. Additionally, prior to the start of drilling, the surficial pavement was cored by Cut N Core and the first 5 to 6 feet of each borehole was advanced via a manual hand auger to further clear for utilities. Upon completion, the boreholes were backfilled with bentonite and patched at the surface with asphalt concrete. Soil cuttings were stored in 55-gallon steel drums and were disposed of offsite.

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GROUP SYMBOLS AND NAMES

Graphic / Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic / Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY elastic ELASTIC SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435-04)
CL	Collapse Potential (ASTM D 5333-03)
CP	Compaction Curve (CTM 216 - 06)
CR	Corrosion, Sulfates, Chlorides (CTM 643 - 99; CTM 417 - 06; CTM 422 - 06)
CU	Consolidated Undrained Triaxial (ASTM D 4767-02)
DS	Direct Shear (ASTM D 3080-04)
EI	Expansion Index (ASTM D 4829-03)
M	Moisture Content (ASTM D 2216-05)
OC	Organic Content (ASTM D 2974-07)
P	Permeability (CTM 220 - 05)
PA	Particle Size Analysis (ASTM D 422-63 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89-02, AASHTO T 90-00)
PL	Point Load Index (ASTM D 5731-05)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301 - 00)
SE	Sand Equivalent (CTM 217 - 99)
SG	Specific Gravity (AASHTO T 100-06)
SL	Shrinkage Limit (ASTM D 427-04)
SW	Swell Potential (ASTM D 4546-03)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166-06) Unconfined Compression - Rock (ASTM D 2938-95)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850-03)
UW	Unit Weight (ASTM D 4767-04)
VS	Vane Shear (AASHTO T 223-96 [2004])

SAMPLER GRAPHIC SYMBOLS

- Standard Penetration Test (SPT)
- Standard California Sampler
- Modified California Sampler
- Shelby Tube
- Piston Sampler
- NX Rock Core
- HQ Rock Core
- Bulk Sample
- Other (see remarks)

DRILLING METHOD SYMBOLS

- Auger Drilling
- Rotary Drilling
- Dynamic Cone or Hand Driven
- Diamond Core

WATER LEVEL SYMBOLS

- First Water Level Reading (during drilling)
- Static Water Level Reading (short-term)
- Static Water Level Reading (long-term)

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REPORT TITLE
BORING RECORD LEGEND

DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**

PROJECT OR BRIDGE NAME
Camino Del Mar Bridge Replacement

BRIDGE NUMBER	PREPARED BY	DATE	SHEET
NA	**ST**	**2-26-20**	**1 of 3**

gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BR KEY P1_SOIL]
PROJECT NUMBER: 20180876.001A

CONSISTENCY OF COHESIVE SOILS				
Descriptor	**Unconfined Compressive Strength (tsf)**	**Pocket Penetrometer (tsf)**	**Torvane (tsf)**	**Field Approximation**
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	0.25 - 0.50	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	0.50 - 1.0	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	1.0 - 2.0	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	2.0 - 4.0	1.0 - 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS	
Descriptor	**SPT N_{60} - Value (blows / foot)**
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE	
Descriptor	**Criteria**
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS	
Descriptor	**Criteria**
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE		
Descriptor		**Size**
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS	
Descriptor	**Criteria**
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION	
Descriptor	**Criteria**
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

NOTE: This legend sheet provides descriptors and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

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REPORT TITLE
BORING RECORD LEGEND

DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**

PROJECT OR BRIDGE NAME
Camino Del Mar Bridge Replacement

BRIDGE NUMBER	PREPARED BY	DATE	SHEET
NA	**ST**	**2-26-20**	**2 of 3**

gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BR KEY P2_SOIL]
PROJECT NUMBER: 20180876.001A

ROCK GRAPHIC SYMBOLS


IGNEOUS ROCK


SEDIMENTARY ROCK


METAMORPHIC ROCK

BEDDING SPACING

Descriptor	Thickness or Spacing
Massive	> 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8 inches to 1 ft
Thinly bedded	1-1/4 to 3-5/8 inches
Very thinly bedded	3/8 inch to 1-1/4 inches
Laminated	< 3/8 inch

WEATHERING DESCRIPTORS FOR INTACT ROCK

	Diagnostic Features					
	Chemical Weathering-Discoloration-Oxidation		Mechanical Weathering and Grain Boundary Conditions	Texture and Solutioning		
Descriptor	Body of Rock	Fracture Surfaces		Texture	Solutioning	General Characteristics
Fresh	No discoloration, not oxidized	No discoloration or oxidation	No separation, intact (tight)	No change	No solutioning	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull	Minor to complete discoloration or oxidation of most surfaces	No visible separation, intact (tight)	Preserved	Minor leaching of some soluble minerals may be noted	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty"; feldspar crystals are "cloudy"	All fracture surfaces are discolored or oxidized	Partial separation of boundaries visible	Generally preserved	Soluble minerals may be mostly leached	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in situ disaggregation (refer to grain boundary conditions)	All fracture surfaces are discolored or oxidized; surfaces are friable	Partial separation, rock is friable; in semi-arid conditions, granitics are disaggregated	Altered by chemical disintegration such as via hydration or argillation	Leaching of soluble minerals may be complete	Dull sound when struck with hammer; usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures or veinlets. Rock is significantly weakened.
Decomposed	Discolored of oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay		Complete separation of grain boundaries (disaggregated)	Resembles a soil; partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes".

Note: Combination descriptors (such as "slightly weathered to fresh") are used where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant identifiable zones can be delineated. Only two adjacent descriptors shall be combined. "Very intensely weathered" is the combination descriptor for "decomposed to intensely weathered".

RELATIVE STRENGTH OF INTACT ROCK

Descriptor	Uniaxial Compressive Strength (psi)
Extremely Strong	> 30,000
Very Strong	14,500 - 30,000
Strong	7,000 - 14,500
Medium Strong	3,500 - 7,000
Weak	700 - 3,500
Very Weak	150 - 700
Extremely Weak	< 150

ROCK HARDNESS

Descriptor	Criteria
Extremely Hard	Specimen cannot be scratched with pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows
Very hard	Specimen cannot be scratched with pocket knife or sharp pick; breaks with repeated heavy hammer blows
Hard	Specimen can be scratched with pocket knife or sharp pick with heavy pressure; heavy hammer blows required to break specimen
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure; breaks with moderate hammer blows
Moderately Soft	Specimen can be grooved 1/6 in. with pocket knife or sharp pick with moderate or heavy pressure; breaks with light hammer blow or heavy hand pressure
Soft	Specimen can be grooved or gouged with pocket knife or sharp pick with light pressure, breaks with light to moderate hand pressure
Very Soft	Specimen can be readily indented, grooved, or gouged with fingernail, or carved with pocket knife; breaks with light hand pressure

CORE RECOVERY CALCULATION (%)

$$\frac{\Sigma \text{ Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100$$

RQD CALCULATION (%)

$$\frac{\Sigma \text{ Length of intact core pieces > 4 in.}}{\text{Total length of core run (in.)}} \times 100$$

FRACTURE DENSITY

Descriptor	Criteria
Unfractured	No fractures
Very Slightly Fractured	Lengths greater 3 ft
Slightly Fractured	Lengths from 1 to 3 ft, few lengths outside that range
Moderately Fractured	Lengths mostly in range of 4 in. to 1 ft, with most lengths about 8 in.
Intensely Fractured	Lengths average from 1 in. to 4 in. with scattered fragmented intervals with lengths less than 4 in.
Very Intensely Fractured	Mostly chips and fragments with few scattered short core lengths

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REPORT TITLE
BORING RECORD LEGEND

DIST.	COUNTY	ROUTE	POSTMILE	EA
11	San Diego	NA	NA	NA

PROJECT OR BRIDGE NAME
Camino Del Mar Bridge Replacement

BRIDGE NUMBER	PREPARED BY	DATE	SHEET
NA	ST	2-26-20	3 of 3

gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BR KEY P3_ROCK]
PROJECT NUMBER: 20180876.001A

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
S.Tena	2-18-20	2-21-20	32.97607° / -117.26928° WGS84	R-20-001
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Pacific Drilling			Sta N/A	~16.00 ft NAVD88
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Mud Rotary			Marl 10	8 in / 4 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
SPT (1.4"), CAL (2.5")			Auto; 140 lbs / 30-inch drop	94%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS DURING DRILLING	AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING
Bentonite and grout			14.0 ft	17.0 ft on 2-21-20	151.0 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		ASPHALT CONCRETE; (5").												
15.0			POORLY GRADED SAND with SILT (SP-SM); yellowish red (5YR 5/6); moist; mostly medium to fine SAND; little fines; non-plastic (ARTIFICIAL FILL (af)).		S1					3					M, PA, R, CR
	5		- yellow (10YR 7/6) and dark yellowish brown (10YR 4/4); coarse to fine SAND.												
10.0			- medium dense; strong brown (7.5YR 4/6); medium to fine SAND.		S2	12 13 13	26	94							
					S3	5 10 11	21	83		5					M, PA
	10		POORLY GRADED SAND with SILT (SP-SM); medium dense; light brownish gray (2.5Y 6/1); moist; mostly fine SAND; little fines; non-plastic (RECENT ALLUVIAL DEPOSITS (Qa)).		S4	8 8 11	19	77							
5.0			- gray (2.5Y 5/1); medium to fine SAND; increase in moisture content.		S5	6 7 9	16	72		14					M, PA, PI
			- wet.		S6	7 11 14	25	89		25					M
0.0	15		POORLY GRADED SAND (SP); medium dense; gray (2.5Y 5/1); wet; medium to fine SAND; non-plastic; micaceous.		S7	6 8 9	17	89		27					M, PA
			POORLY GRADED SAND with SILT (SP-SM); medium dense; dark gray (2.5Y 4/1); wet; medium to fine SAND; little fines; non-plastic.		S8	3 7 5	12	77		26					Added water at 18 feet. M
-5.0	20		- loose; few coarse subrounded GRAVEL, 2 in. max. dia..		S9	1 3 3	6	39							Switch to mud rotary drilling from hollow stem auger at 20 feet. PA
	25														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				R-20-001
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	San Diego	NA	NA	NA
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	ST		2-26-20	1 of 6

PLOTTED: 04/21/2020 02:03 PM BY: JBonfiglio
PROJECT NUMBER: 20180876.001A OFFICE FILTER: SAN DIEGO
gINT FILE: Klf_gint_master_2018 gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	25		SILTY SAND (SM); medium dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines.		S10	7 7 6	13	72						
-10.0			LEAN CLAY (CL); very soft; dark gray (2.5Y 4/1); wet; few fine SAND; mostly fines; medium plasticity.											
	30				S11	2 4 3	7	33		55	66	PP=0.0		M, UW, PI
-15.0			SILTY SAND (SM); loose; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; trace shell fragments.											Rocky from 33 to 34 feet.
	35		FAT CLAY (CH); very soft; dark gray (2.5Y 4/1); wet; few medium SAND; mostly fines; medium to high plasticity; trace roots and shell fragments.		S12	4 4 4	8	55				PP=0.0		PA, PI
-20.0			SILTY SAND with GRAVEL (SM); wet; (inferred from drilling action).											Hard drilling due to gravel layers.
	40		- subrounded gravel (3") inside sampler.			17 18 34	52	NR						Rocky from 40 to 50 feet due to gravel layers. No sample recovery at 40 to 41.5 feet.
-25.0														
	45					14 15 16	31	NR						No sample recovery at 45 to 46.5 feet.
-30.0			SILTY SAND (SM); dense; dark gray (2.5Y 4/1); wet; mostly coarse to fine SAND; little fines; non-plastic; trace shell fragments (YOUNG ALLUVIAL DEPOSITS (Qya)).											
	50				S13	17 20 20	40	44		21	110			M, UW, PA
-35.0														
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-001**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-26-20**	**2 of 6**

PLOTTED: 04/21/2020 02:03 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	55		SILTY SAND (SM); dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic.		S14	15 20 21	41	77						
-40.0														
	60		- very dense; micaceous.		S15	17 26 40	66	55		25	102			M, UW, PA, PI
-45.0														
	65		- loose.		S16	11 5 3	8	55				PP=0.0		
-50.0			SANDY LEAN CLAY (CL); very soft; dark gray (2.5Y 4/1); wet; some fine SAND; mostly fines; low to medium plasticity.											
			POORLY GRADED SAND with SILT (SP-SM); very dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; trace shell fragments.											
	70				S17	11 20 31	51	66		21	108			M, UW, PA
-55.0														
	75		- dense.		S18	21 23 20	43	77						PI
-60.0														
	80		- very dense.		S19	29 40 31	71	66		21	107			M, UW, PA
-65.0														
	85													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-001**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-26-20**	**3 of 6**

PLOTTED: 04/21/2020 02:03 PM BY: JBonfiglio
PROJECT NUMBER: 20180876.001A OFFICE FILTER: SAN DIEGO
gINT FILE: Klf_gint_master_2018 gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		SILTY SAND (SM); medium dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic (YOUNG ESTUARINE DEPOSITS (Qyes)).		S20	13 11 10	21	72							
-70.0			LEAN CLAY (CL); medium stiff; black (10YR 2/1); wet; few fine SAND; mostly fines; medium plasticity; micaceous, trace shell fragments.												
	90				S21	4 5 7	12	66		47	77	PP=0.5			M, UW, PI, WA
-75.0															
	95		SILTY SAND (SM); medium dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; some fines; non-plastic (OLD ALLUVIAL DEPOSITS (Qoa)).		S22	4 6 14	20	100							
-80.0															
	100		- dense.		S23	7 13 22	35	66							DS
-85.0															
	105		POORLY GRADED SAND with SILT (SP-SM); medium dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; micaceous.		S24	5 10 16	26	89							
-90.0															
	110		- SAA.		S25	12 11 13	24	66		32	92				M, UW, PA
-95.0															
	115														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-001**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-26-20**	**4 of 6**

PLOTTED: 04/21/2020 02:03 PM BY: JBonfiglio
PROJECT NUMBER: 20180876.001A OFFICE FILTER: SAN DIEGO
gINT FILE: Klf_gint_master_2018 gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	115		SILTY SAND (SM); dense; dark gray (10YR 4/1); mostly medium to fine SAND; little fines; non-plastic.		S26	10 17 16	33	100						
-100.0														
	120		- very dense.		S27	14 24 33	57	33		25	103			M, UW, PA
-105.0														
	125		- SAA.		S28	12 24 31	55	89						
-110.0														
	130		- SAA.		S29	14 24 29	53	66						
-115.0														DS Increase in drilling effort at 132 feet.
	135													
-120.0														
	140		- dense.		S30	21 19 17	36	100						
-125.0														
	145													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-001**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-26-20**	**5 of 6**

PLOTTED: 04/21/2020 02:03 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	145		SILTY SAND (SM); dense; dark gray (10YR 4/1); mostly medium to fine SAND; little fines; non-plastic.												
-130.0			CLAYSTONE; dark reddish brown (2.5YR 3/4) with grayish green (GLEY 1-5/5GY); medium plasticity (DEL MAR FORMATION (Td)).												Hard drilling at 146 feet.
	150			X	S31	30 50/5"	50/5	100				PP=4.5			PA, PI
-135.0			Bottom of borehole at 151.0 ft bgs												
-140.0	155														
-145.0	160														
-150.0	165														
-155.0	170														
	175														

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REPORT TITLE **BORING RECORD**				HOLE ID **R-20-001**
DIST. **11**	COUNTY **San Diego**	ROUTE **NA**	POSTMILE **NA**	EA **NA**
PROJECT OR BRIDGE NAME **Camino Del Mar Bridge Replacement**				
BRIDGE NUMBER **NA**	PREPARED BY **ST**		DATE **2-26-20**	SHEET **6 of 6**

PLOTTED: 04/21/2020 02:03 PM BY: JBonfiglio
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]
PROJECT NUMBER: 20180876.001A
OFFICE FILTER: SAN DIEGO

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
S.Tena	2-10-20	2-13-20	32.97396° / -117.26878° WGS84	R-20-002
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Pacific Drilling			Sta N/A	~16.00 ft NAVD88
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Mud Rotary			Marl 10	8 in / 4 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
SPT (1.4"), CAL (2.5")			Auto; 140 lbs / 30-inch drop	94%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS DURING DRILLING 11.0 ft / AFTER DRILLING (DATE) Not Applicable	TOTAL DEPTH OF BORING
Bentonite and grout				208.0 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		ASPHALT CONCRETE; (6").												
15.0			POORLY GRADED SAND (SP); light brownish gray (10YR 6/2); moist; trace subrounded GRAVEL, 2 in. max. dia.; mostly medium to fine SAND; non-plastic; micaceous (ARTIFICIAL FILL (af)).		S1					4					M, PA, R, CR
	5														
10.0			POORLY GRADED SAND with SILT (SP-SM); medium dense; light brownish gray (10YR 6/2); moist; mostly medium to fine SAND; little fines; non-plastic.		S2	5 4 7	11	100							
			- loose; trace shell fragments.		S3	5 5 5	10	66		4					M, PA, PI
			POORLY GRADED SAND with SILT (SP-SM); very loose; brown (10YR 5/3); moist; mostly medium to fine SAND; little fines; non-plastic; micaceous (RECENT ALLUVIAL DEPOSITS (Qa)).		S4	3 3 1	4	55							
5.0	10		- dark grayish brown (10YR 4/2); moist to wet.		S5	2 1 1	2	55		21					M, PA
			- very dark gray (10YR 3/1); wet; some fines; non-plastic to low plasticity; trace of odor.		S6	1 2 2	4	44							
0.0	15		POORLY GRADED SAND (SP); loose; dark gray (10YR 4/1); wet; mostly medium to fine SAND; non-plastic; trace shell fragments, no odor, micaceous. -gravelly layers from 16 to 18 feet.		S7	2 1 4	5	77		27					Added water at 15 feet. M, PA
			- medium dense.		S8	8 9 9	18	77		27					Switch to mud rotary drilling from hollow stem auger at 16.5 feet. M
	20					1 4 8	12	NR							No sample recovery at 19 to 20.5 feet.
-5.0			SILTY SAND (SM); loose; dark gray (10YR 4/1); wet; mostly medium to fine SAND; some fines; non-plastic; trace shell fragments.		S9	6 3 2	5	55							PA, PI
	25														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				R-20-002
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	San Diego	NA	NA	NA
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	ST		2-14-20	1 of 8

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
PROJECT NUMBER: 20180876.001A OFFICE FILTER: SAN DIEGO
gINT FILE: Klf_gint_master_2018 gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	25		SILTY SAND (SM); dense; dark gray (10YR 4/1); trace subrounded GRAVEL, 3 in. max. dia.; mostly medium to fine SAND; some fines; non-plastic.		S10	12 17 17	34	33		26	100			M, UW
-10.0														
	30		POORLY GRADED SAND with SILT (SP-SM); dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; little fines; non-plastic (YOUNG ALLUVIAL DEPOSITS (Qya)).		S11	14 18 16	34	77						PA
-15.0														
	35		- SAA.		S12	17 21 20	41	55		24	101			M, UW
-20.0														
	40		SILTY SAND (SM); medium dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; some fines; non-plastic; increase in SILT content.		S13	6 9 5	14	77						PA
-25.0														
	45		- very dense; trace GRAVEL, 3 in. max. dia.; medium SAND; little fines.		S14	22 37 44	81	66		24	105			M, UW
-30.0														
	50		POORLY GRADED SAND (SP); medium dense; dark gray; wet; mostly medium to fine SAND; non-plastic; trace shell fragments.		S15	11 14 15	29	100						PA, PI
-35.0														
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**2 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	55		POORLY GRADED SAND with SILT (SP-SM); very dense; dark gray (10YR 4/1); mostly medium SAND; little fines; non-plastic.		S16	16 34 39	73	66		37	92			M, UW
-40.0														
	60		- medium dense.		S17	10 9 12	21	77						PA
-45.0														
	65		- very dense.		S18	24 30 26	56	66		29	96			M, UW
-50.0														
	70		- medium dense.		S19	19 15 14	29	77						PA
-55.0														
	75		- very dense.		S20	14 24 31	55	66		30	96			M, UW
-60.0														
			SILTY SAND (SM); loose; dark gray (10YR 4/1); wet; mostly fine SAND; some fines; non-plastic to low plasticity; micaceous, trace shell fragments (YOUNG ESTUARINE DEPOSITS (Qyes)).											
	80				S21	5 3 5	8	100				PP=0.5		PA, PI
-65.0														
	85													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**3 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method / Casing Depth	Remarks
	85		SANDY SILT (ML); medium stiff; dark gray (10YR 4/1); wet; some fine SAND; mostly fines; non-plastic to low plasticity.		S22	8 11 16	27	100		48	74	PP=0.5		Hole caved to 20 feet bgs on 2/11/2020 prior to start of drilling activities. M, UW
-70.0														
			LEAN CLAY (CL); medium stiff; dark gray (10YR 4/1); wet; few fine SAND; mostly fines; low plasticity; micaceous, trace shell fragments.											
	90				S23	3 4 5	9	100				PP=0.5		PA
-75.0														
			SILTY SAND (SM); dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic; micaceous, trace shell fragments (OLD ALLUVIAL DEPOSITS (Qoa)).											
	95				S24	10 18 30	48	66		28	95			M, UW, UC
-80.0														
	100		- medium dense; some fines; non-plastic to low plasticity; interbeded layer (1") of Silty Clay material.		S25	7 10 9	19	100						PA
-85.0														
	105		- dense; little fines; non-plastic.		S26	20 25 17	42	33						DS
-90.0														
	110		- medium dense.		S27	12 13 11	24	83						PA, PI
-95.0														
	115													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**4 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
PROJECT NUMBER: 20180876.001A OFFICE FILTER: SAN DIEGO
gINT FILE: Klf_gint_master_2018 gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	115		SILTY SAND (SM); dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic.		S28	12 24 26	50	66		29	104				M, UW
-100.0															
	120		- medium dense; coarse to medium SAND.		S29	13 14 13	27	77							
-105.0															
	125		- very dense.		S30	15 23 31	54	44		31	94				Hole caved to 115 feet bgs on 2/12/2020 prior to start of drilling activities. M, UW, PA
-110.0															
	130		- medium dense.		S31	8 9 12	21	89							
-115.0															
	135		- very dense.		S32	32 37 27	64	44							
-120.0															DS
	140		- loose; some medium to fine SAND; some fines; non-plastic to low plasticity; micaceous, increase in SILT content.		S33	5 2 8	10	94				PP=0.5			PA, PI
-125.0															
	145														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**5 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	145		SILTY SAND (SM); very dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic.		S34	23 29 30	59	44		29	92				M, UW
-130.0	150		POORLY GRADED SAND with SILT (SP-SM); dense; very dark gray; wet; mostly medium to fine SAND; little fines; non-plastic.		S35	15 16 17	33	77							PA
-135.0	155														
-140.0	160		- very dense; coarse to medium SAND.		S36	25 37 38	75	44							DS
-145.0	165														
-150.0	170		SILTY SAND (SM); medium dense; very dark gray; wet; some fines; non-plastic to low plasticity.		S37	4 7 9	16	100							PA
-155.0	175														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**6 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	175		SILTY SAND (SM); medium dense; very dark gray (10YR 3/1); wet; mostly coarse to medium SAND; some fines; non-plastic to low plasticity.												
-160.0															
			SILTY CLAY with SAND (CL-ML); stiff; very dark gray (10YR 3/1); wet; little SAND; mostly fines; medium plasticity.												
	180				S38	19	68	61				PP=1.0			
					S39	28				24	105				M, UW, PI
-165.0					S39	40				18	107				M, UW
			SILTY SAND (SM); very dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic.												
	185														
-170.0															Hole caved to 145 feet bgs on 2/13/2020 prior to start of drilling activities.
	190		- dense.		S40	19	36	94							
-175.0					S40	17									
					S40	19									
	195														
-180.0															
	200		- very dense; olive gray (5Y 5/2); trace subrounded GRAVEL, 1 in. max. dia.; coarse to medium SAND; little fines; iron oxide staining.		S41	34	50/5	45							
-185.0					S41	50/5"									
	205														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**7 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
PROJECT NUMBER: 20180876.001A
OFFICE FILTER: SAN DIEGO
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
-190.0	205		SILTY SAND (SM); very dense; olive gray (5Y 5/2); trace subrounded GRAVEL, 1 in. max. dia.; mostly coarse to medium SAND; little fines.												Practical refusal at 208 feet.
			Bottom of borehole at 208.0 ft bgs												
-195.0	210														
-200.0	215														
-205.0	220														
-210.0	225														
-215.0	230														
	235														

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REPORT TITLE				HOLE ID
BORING RECORD				**R-20-002**
DIST.	COUNTY	ROUTE	POSTMILE	EA
11	**San Diego**	**NA**	**NA**	**NA**
PROJECT OR BRIDGE NAME				
Camino Del Mar Bridge Replacement				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
NA	**ST**		**2-14-20**	**8 of 8**

PLOTTED: 04/21/2020 02:05 PM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180876.001A
gINT FILE: Klf_gint_master_2018
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2018.GLB [CLIENT_CALTRANS BORING RECORD MET/ENG]

APPENDIX B

CONE PENETROMETER TEST (CPT) LOGS

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FUGRO
Fugro USA Land, Inc.
6100 Hillcroft Ave.
Houston, Texas 77081
USA

March 3, 2020
Report Number 04.09200002

KLEINFELDER
550 West C Street
Suite 1200
San Diego, California 92101
USA

Attn.: Janna Bonfiglio

REPORT FOR
PIEZOCONE PENETRATION TESTING,
SHEAR-WAVE VELOCITY MEASUREMENTS
AND RELATED SERVICES
DEL MAR, CALIFORNIA

Dear. Ms. Bonfiglio,

Introduction

Fugro is pleased to present data report for Piezocone Penetration Testing, Seismic Shear-Wave Velocity Measurements and Related Services performed at the above-referenced site. This report contains the scope of services performed and the test results.

Scope of Services

We performed four (4) Piezocone Penetration Tests (PCPT) to depths ranging from 16 ft to 200 ft below ground surface and one (1) Seismic PCPT (SCPT) to a depth of 200 ft penetration. All PCPT sounding locations were grouted after the completion of the tests.

PCPT Testing

The PCPT soundings were conducted in general accordance with ASTM D5778-12, *Electronic Friction Cone and Piezocone Penetration Testing of Soils* using a 30-ton truck mounted CPT unit. The in-situ soil data was obtained by hydraulically advancing a cylindrical steel rod, with an instrumented probe at the base,

vertically into the subsurface materials at a constant rate of 2 centimeters per second. The instrumented probe consists of a cone-shaped tip element, with an apex angle of 60 degrees with a base area of 15 square centimeters (cm^2) and a cylindrical-shaped side friction sleeve with a surface area of 200 cm^2. A pore transducer is mounted between the tip and friction sleeve. Measurements of penetration resistance at the cone tip (q_c), frictional resistance along the friction sleeve (f_s), and pore water pressure (u_2), were recorded

with depth during penetration. PCPT sounding measurements collected for this project are presented on the logs attached at the end of this report.

PCPT methods test the soil *in situ* and soil samples are not obtained. There are several methods to identify the soil type using the PCPT data collected. For your reference, we have presented soil stratigraphy using the attached *Campanella and Robertson's Simplified Soil Behavior Chart (12-zone, 1986)*.

Shear Wave Velocity Measurements

The shear wave velocity measurements were conducted in general accordance with ASTM D7400-08, *Standard Test Methods for Downhole Seismic Testing* during the PCPT sounding. A PCPT tip with x, y, and z geophones located behind the friction sleeve was used. Seismic readings were taken at 5 foot depth intervals during the sounding. The energy source for the seismic readings was a metal shear beam struck horizontally. Multiple readings were stacked at each interval. The interval velocities were determined from arrival times and relative arrival times of horizontally polarized shear (SH) seismic waves.

Please note that because of the empirical nature of the soil behavior chart, the soil identification should be verified locally from soil borings and laboratory testing. Some soils, such as cemented or calcareous soils, or glacial tills are outside the limits of the soil behavior chart.

Closing

Fugro appreciates the opportunity to be of service to you. If you have any questions, please feel free to contact me at 713.346.4004.

Best Regards,

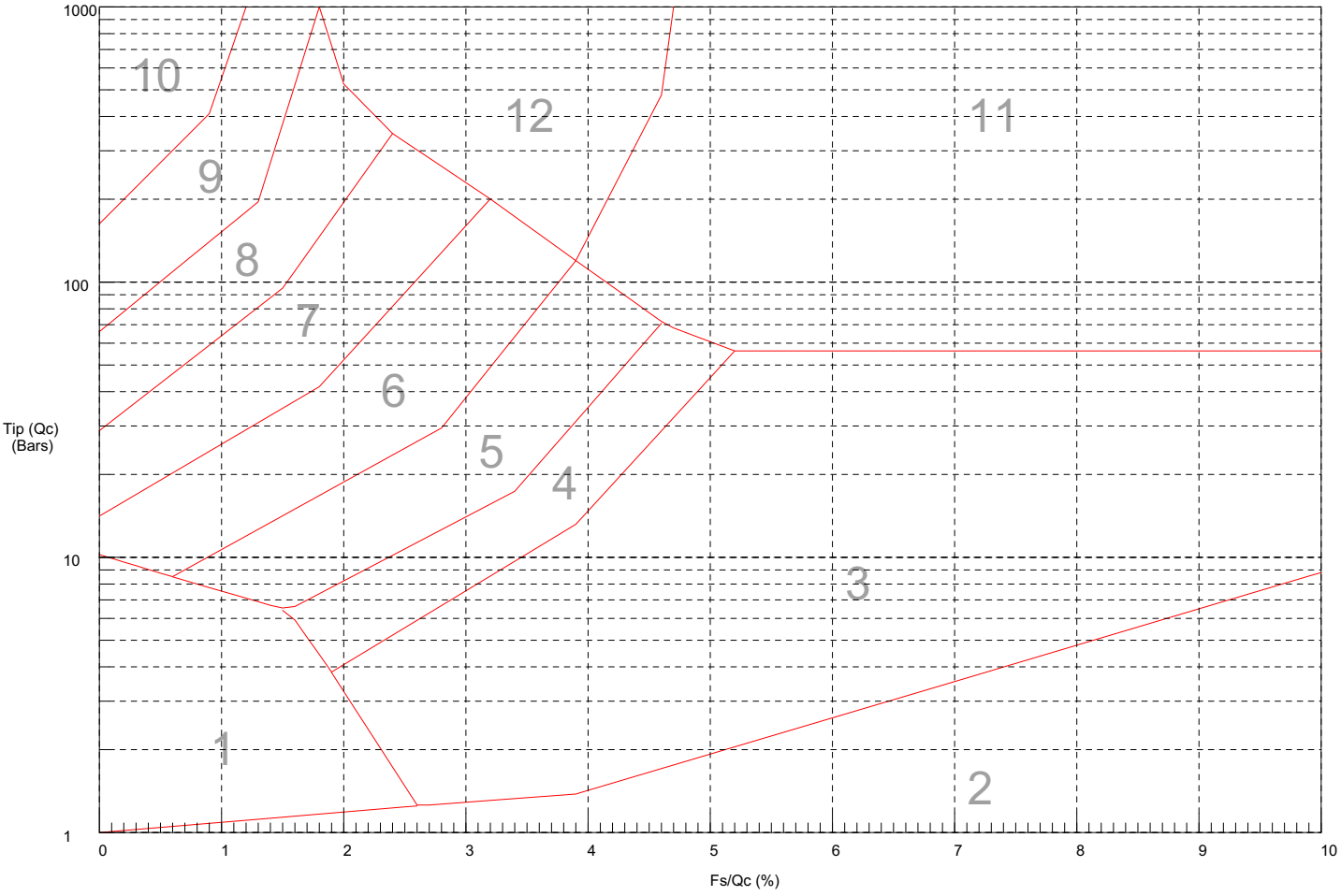
Sheldon Collins
Service Line Manager – CPT
North America

SC/am

Attachments: *Campanella and Robertson's Simplified Soil Behavior Chart* (1 page)
PCPT Sounding Logs (9 pages)
Four (4) Electronic Data Files
Plots of Shear Waves and Shear Waves Velocity (2 pages)
One (1) Shear Wave Velocity Spreadsheets

12 Zone Soil Behavior Chart

Classification Data:
Robertson and Campanella UBC-1986



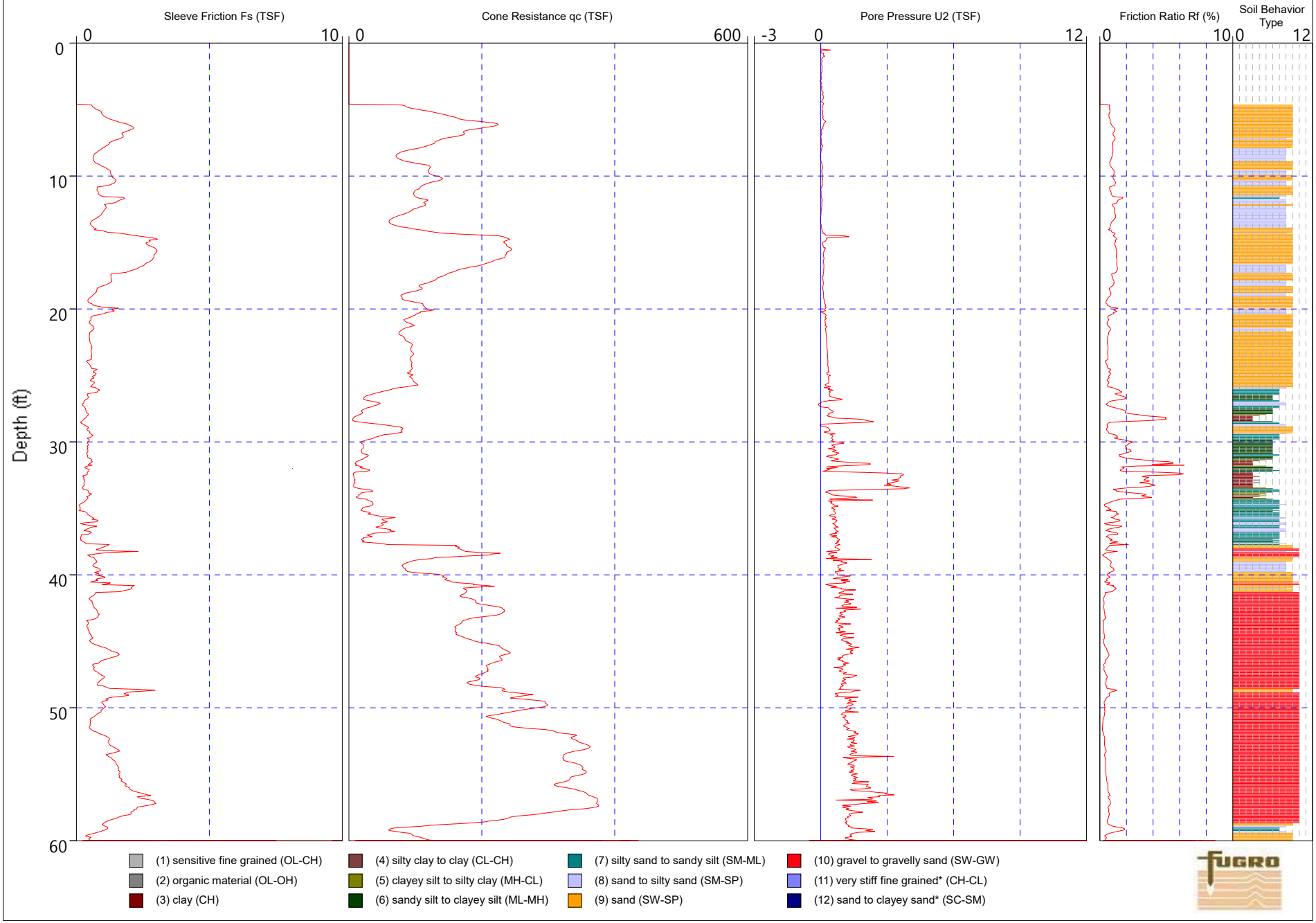
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

* Overconsolidated or cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

CPT Number: CPT-20-001
Date: 18-Feb-2020
Elevation: 0.00

Coordinates: 32.976127, -117.269275
Cone Number: CP15-CF25PB7SN2-P1E1 2111

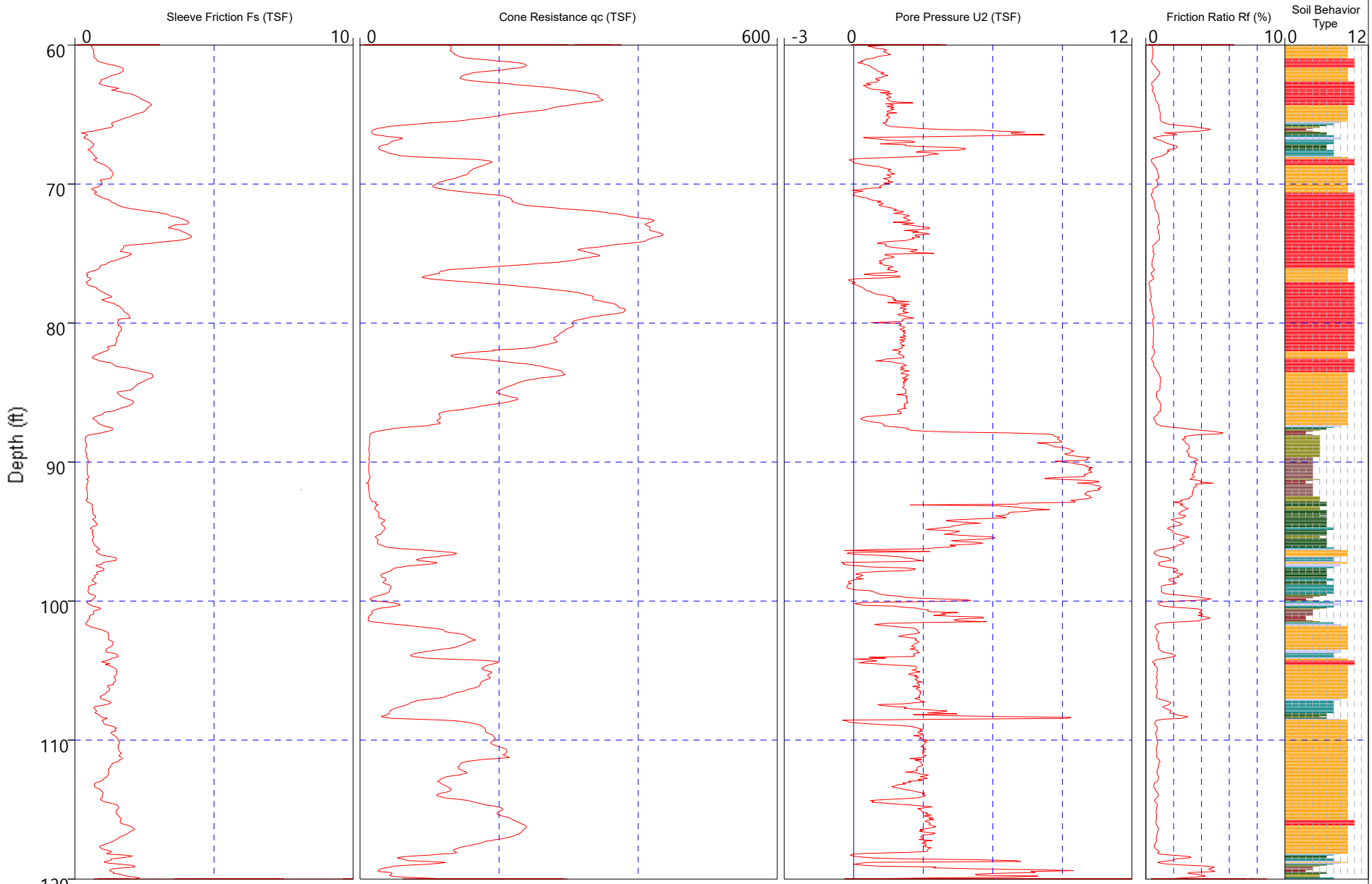


Robertson et al. 1986 *Overconsolidated or Cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

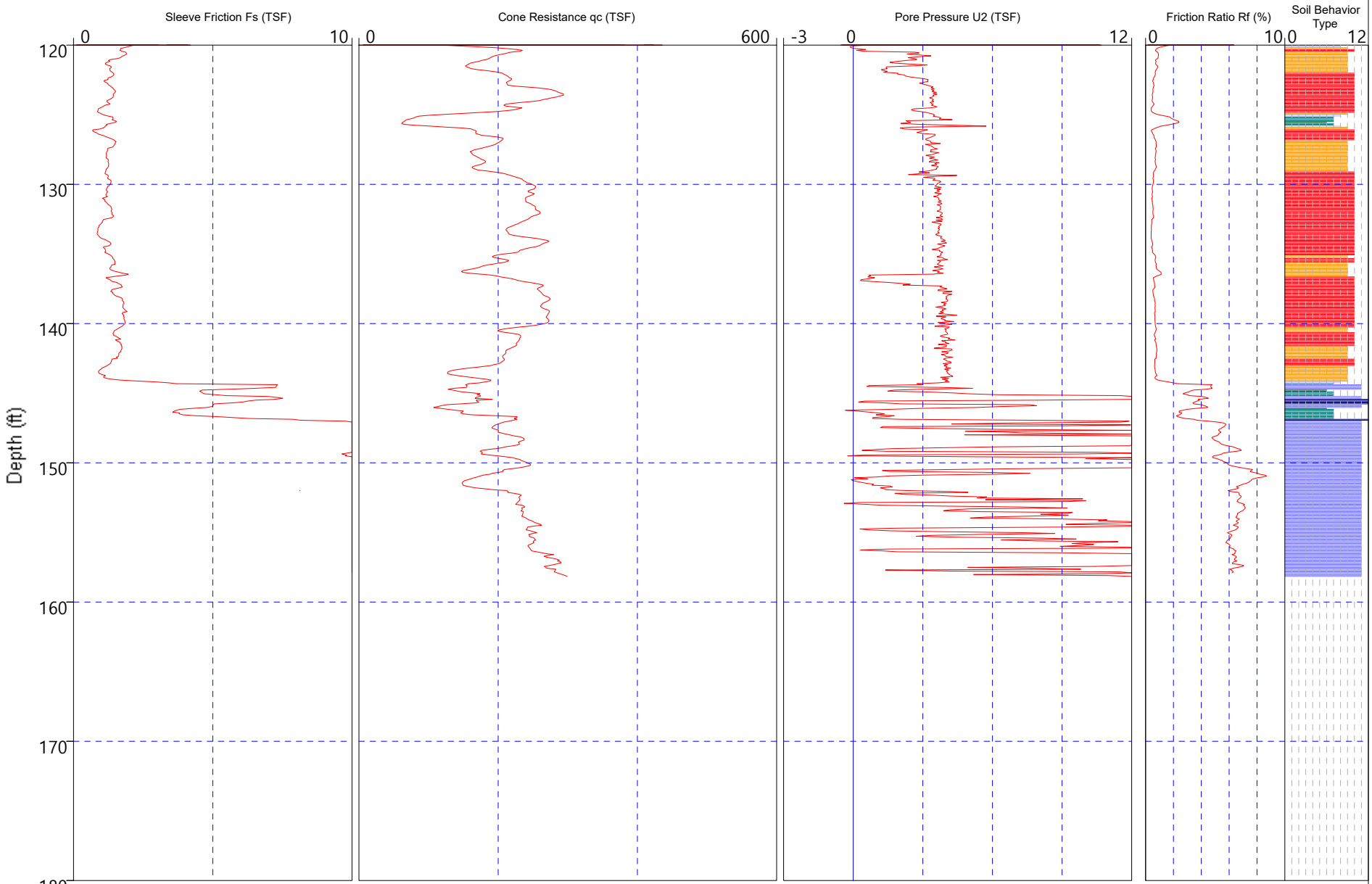
CPT Number: CPT-20-001
Date: 18-Feb-2020
Elevation: 0.00

Coordinates: 32.976127, -117.269275
Cone Number: CP15-CF25PB7SN2-P1E1 2111



Robertson et al. 1986 *Overconsolidated or Cemented

Job Number:	04.09200002	**CPT Number:**	CPT-20-001	**Coordinates:**	32.976127, -117.269275
Operator:	D. Garza	**Date:**	18-Feb-2020	**Cone Number:**	CP15-CF25PB7SN2-P1E1 2111
Location:	Del Mar, CA	**Elevation:**	0.00		



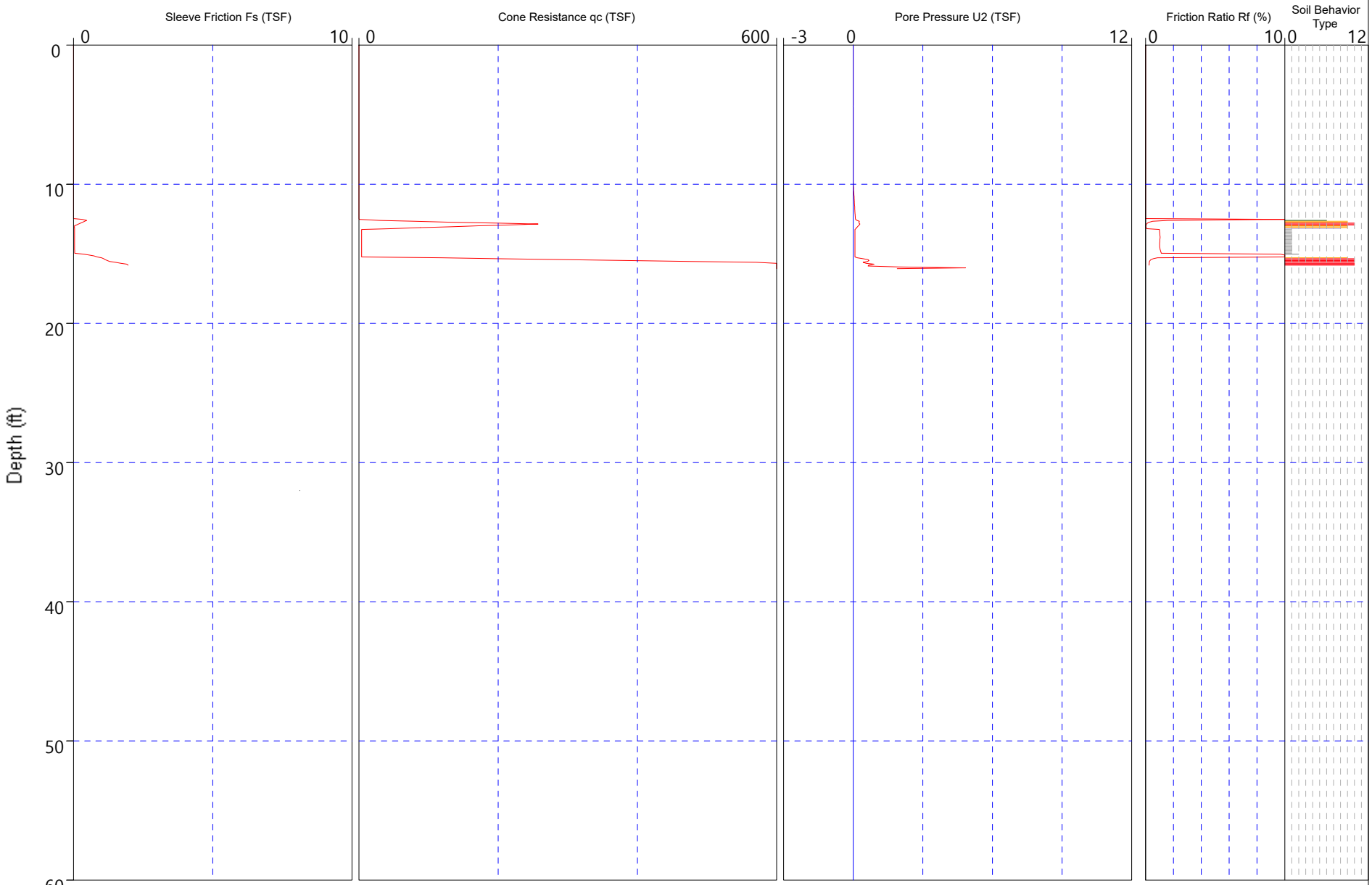
(1) sensitive fine grained (OL-CH)
(2) organic material (OL-OH)
(3) clay (CH)
(4) silty clay to clay (CL-CH)
(5) clayey silt to silty clay (MH-CL)
(6) sandy silt to clayey silt (ML-MH)
(7) silty sand to sandy silt (SM-ML)
(8) sand to silty sand (SM-SP)
(9) sand (SW-SP)
(10) gravel to gravelly sand (SW-GW)
(11) very stiff fine grained* (CH-CL)
(12) sand to clayey sand* (SC-SM)

Robertson et al. 1986 *Overconsolidated or Cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

CPT Number: CPT-20-002
Date: 21-Feb-2020
Elevation: 0.00

Coordinates: 32.975012, -117.268971
Cone Number: CP15-CF75PB7SN2-P1E1 2999



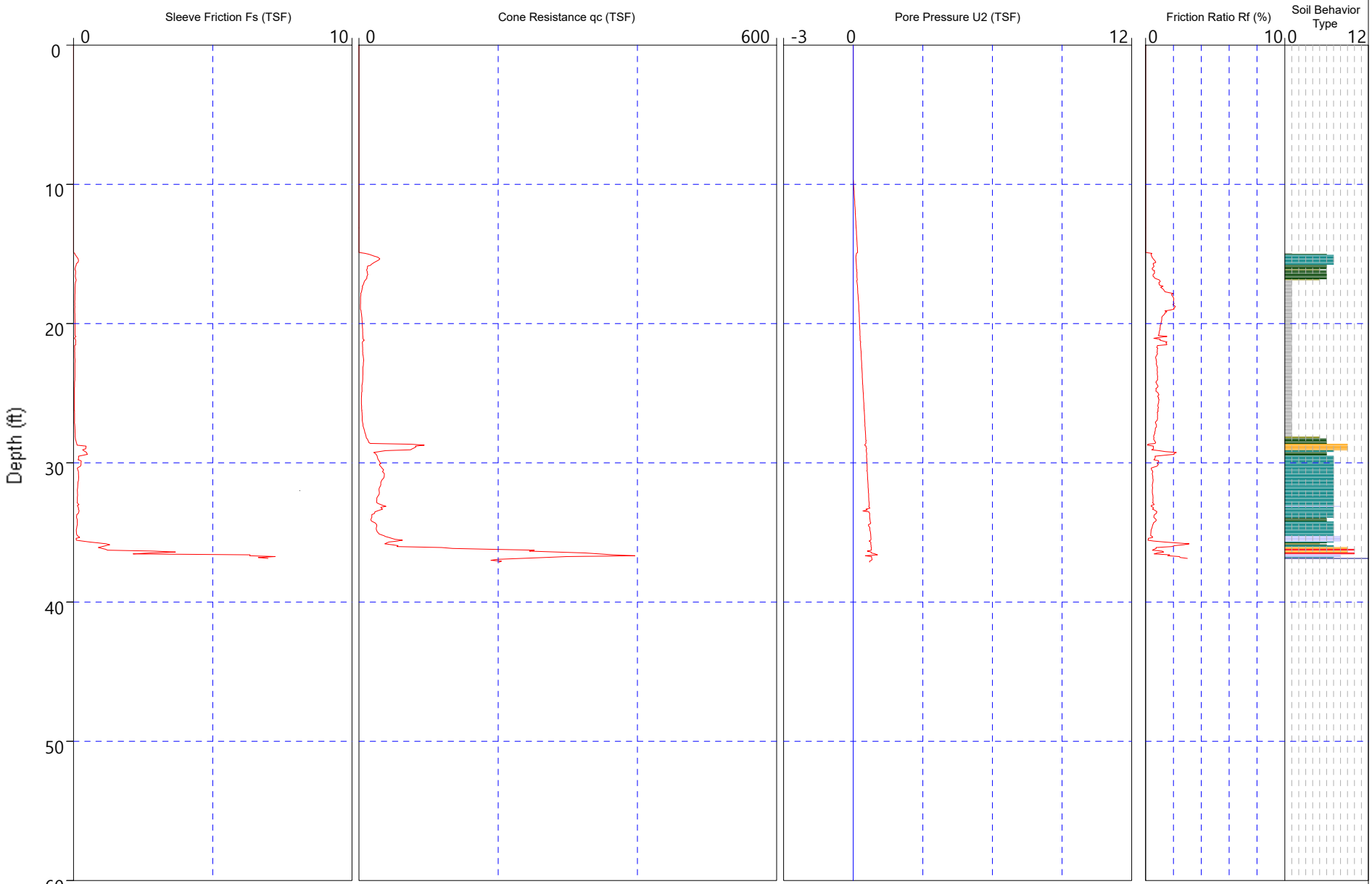
(1) sensitive fine grained (OL-CH)
(2) organic material (OL-OH)
(3) clay (CH)
(4) silty clay to clay (CL-CH)
(5) clayey silt to silty clay (MH-CL)
(6) sandy silt to clayey silt (ML-MH)
(7) silty sand to sandy silt (SM-ML)
(8) sand to silty sand (SM-SP)
(9) sand (SW-SP)
(10) gravel to gravelly sand (SW-GW)
(11) very stiff fine grained* (CH-CL)
(12) sand to clayey sand* (SC-SM)

Robertson et al. 1986 *Overconsolidated or Cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

CPT Number: CPT-20-002A
Date: 21-Feb-2020
Elevation: 0.00

Coordinates: 32.975012, -117.268971
Cone Number: CP15-CF75PB7SN2-P1E1 2999

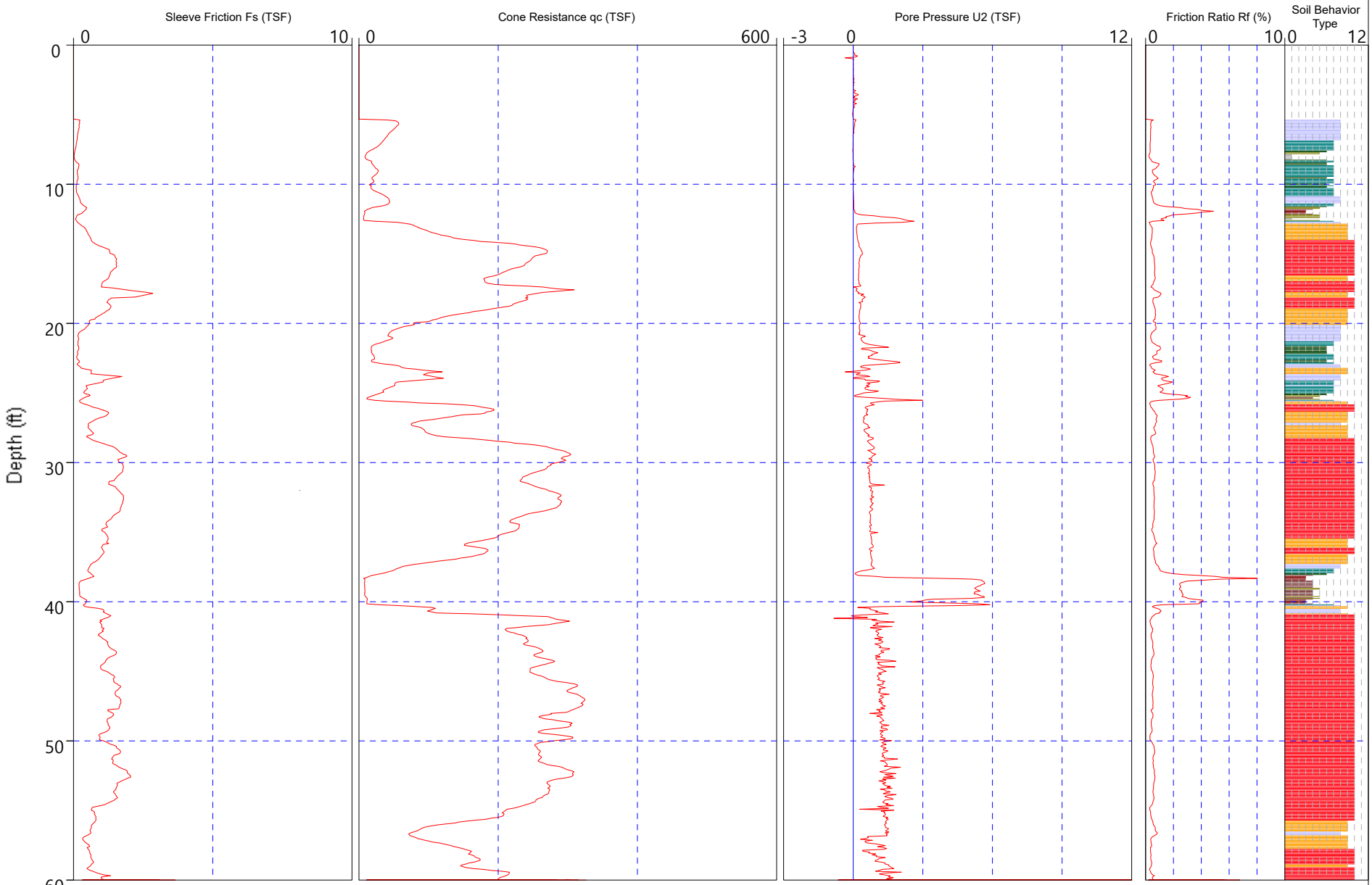


Robertson et al. 1986 *Overconsolidated or Cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

CPT Number: CPT-20-003
Date: 19-Feb-2020
Elevation: 0.00

Coordinates: 32.973928, -117.268763
Cone Number: CP15-CF75PB7SN2-P1E1 2999



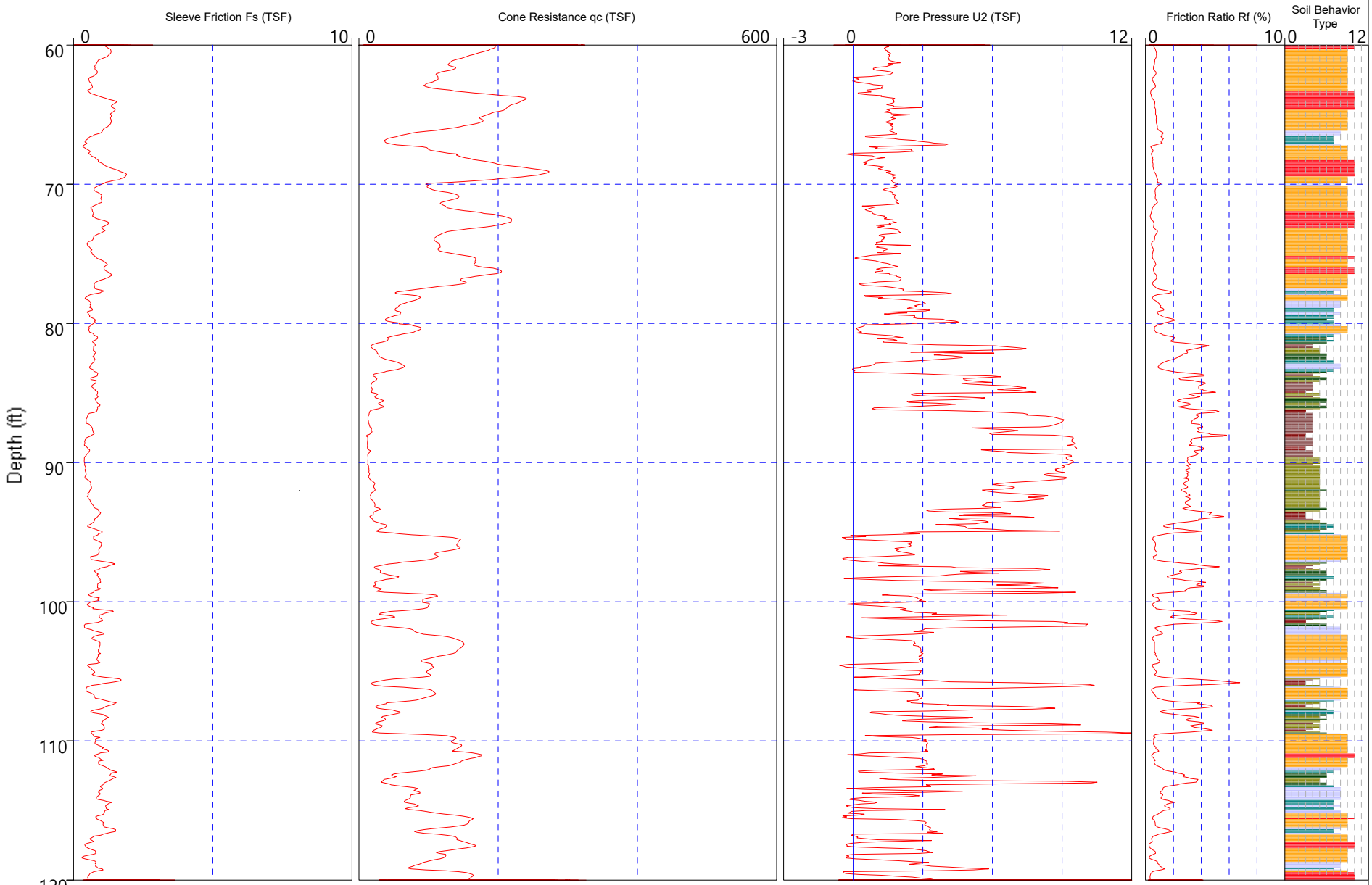
(1) sensitive fine grained (OL-CH)
(2) organic material (OL-OH)
(3) clay (CH)
(4) silty clay to clay (CL-CH)
(5) clayey silt to silty clay (MH-CL)
(6) sandy silt to clayey silt (ML-MH)
(7) silty sand to sandy silt (SM-ML)
(8) sand to silty sand (SM-SP)
(9) sand (SW-SP)
(10) gravel to gravelly sand (SW-GW)
(11) very stiff fine grained* (CH-CL)
(12) sand to clayey sand* (SC-SM)

Robertson et al. 1986 *Overconsolidated or Cemented

Job Number: 04.09200002
Operator: D. Garza
Location: Del Mar, CA

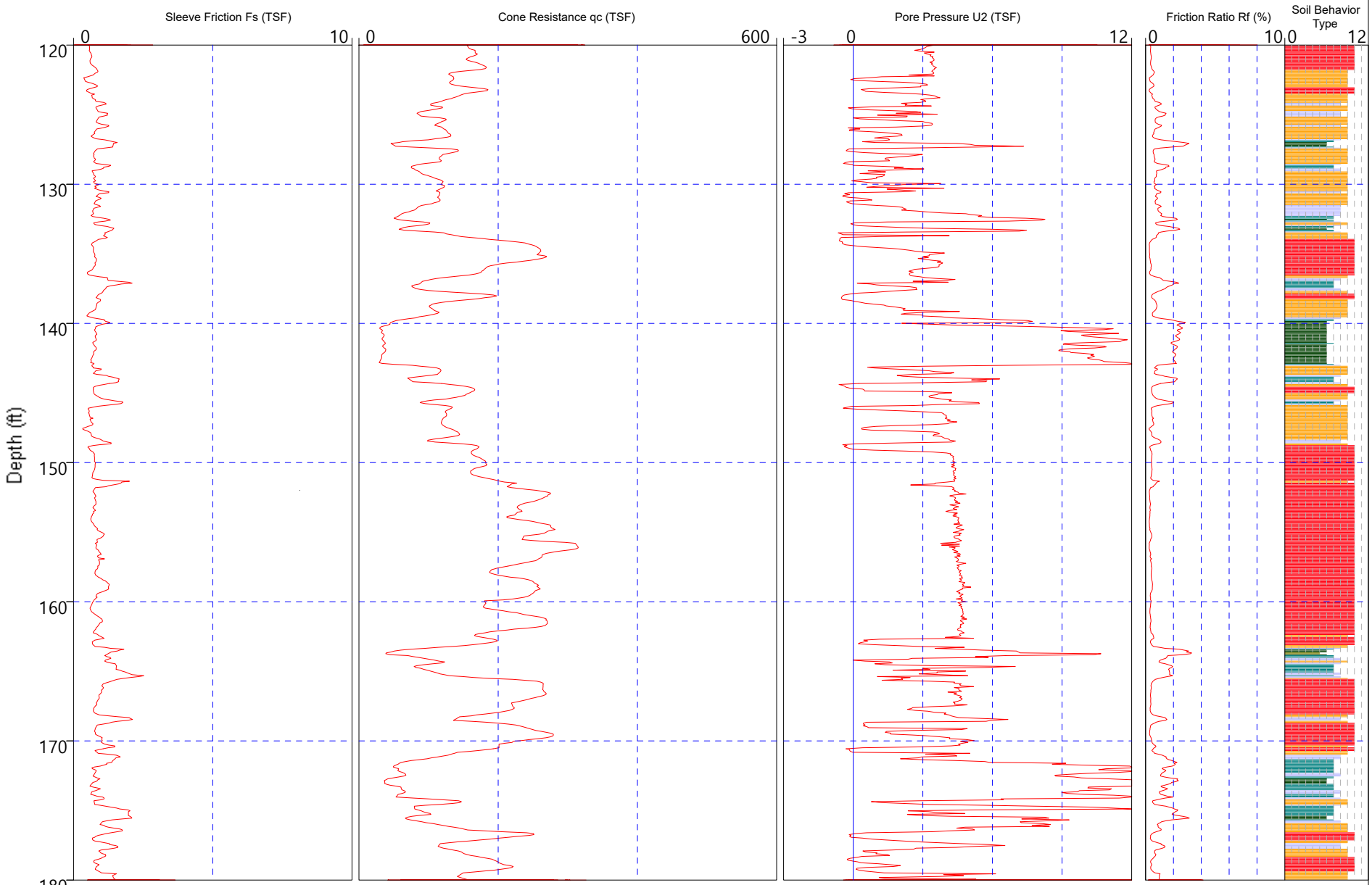
CPT Number: CPT-20-003
Date: 19-Feb-2020
Elevation: 0.00

Coordinates: 32.973928, -117.268763
Cone Number: CP15-CF75PB7SN2-P1E1 2999



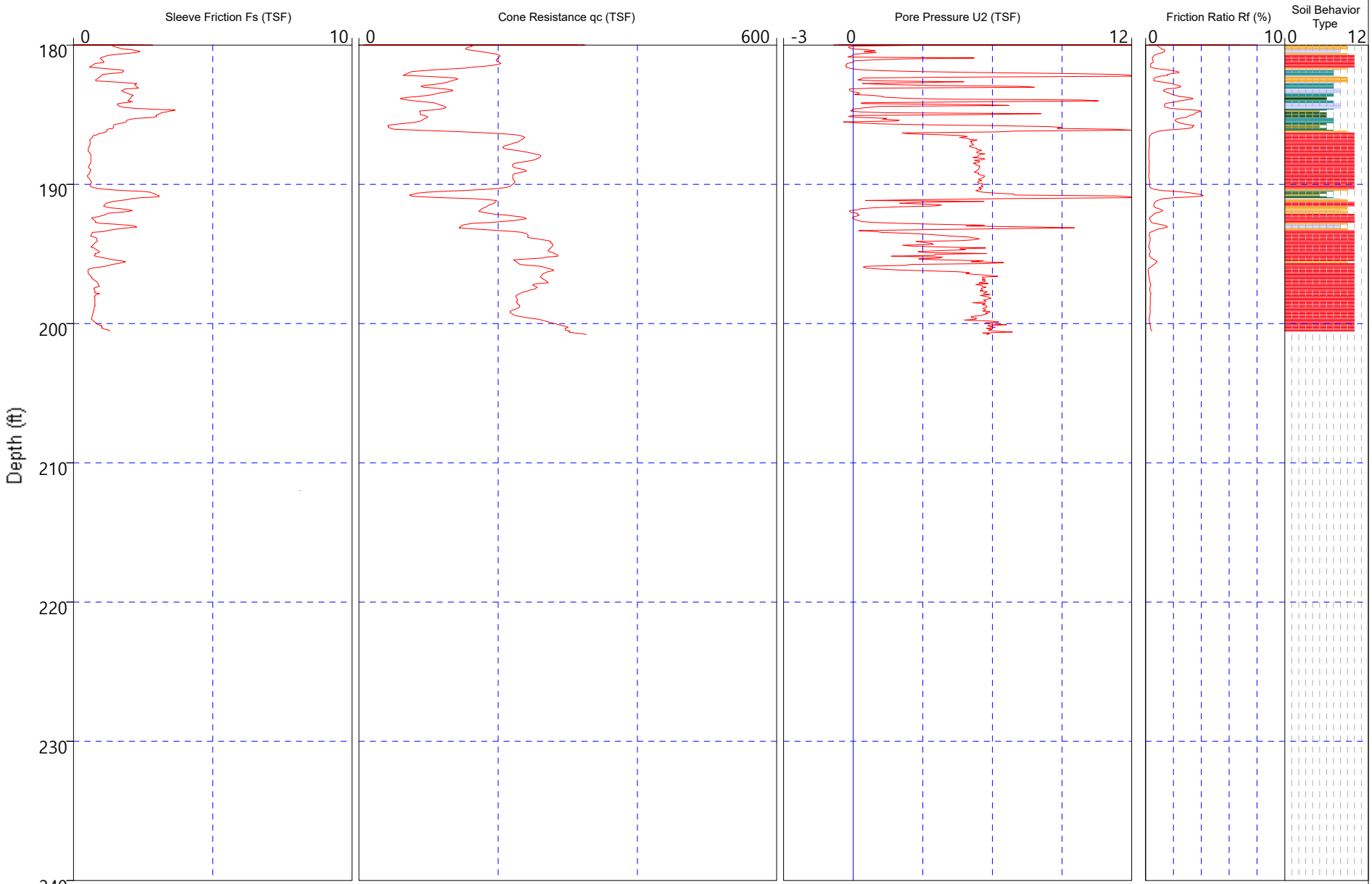
Robertson et al. 1986 *Overconsolidated or Cemented

Job Number:	04.09200002	**CPT Number:**	CPT-20-003	**Coordinates:**	32.973928, -117.268763
Operator:	D. Garza	**Date:**	19-Feb-2020	**Cone Number:**	CP15-CF75PB7SN2-P1E1 2999
Location:	Del Mar, CA	**Elevation:**	0.00		

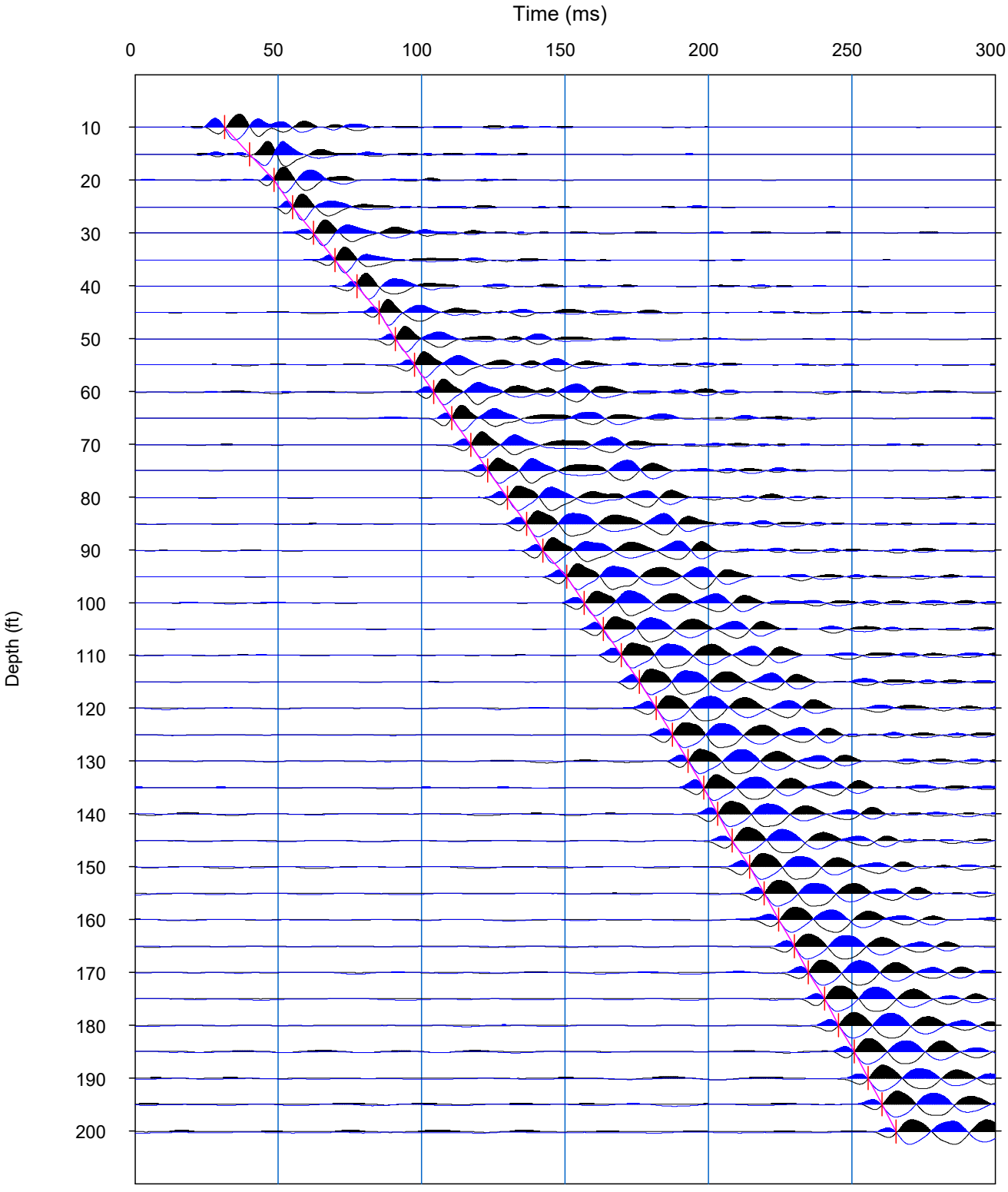


Robertson et al. 1986 *Overconsolidated or Cemented

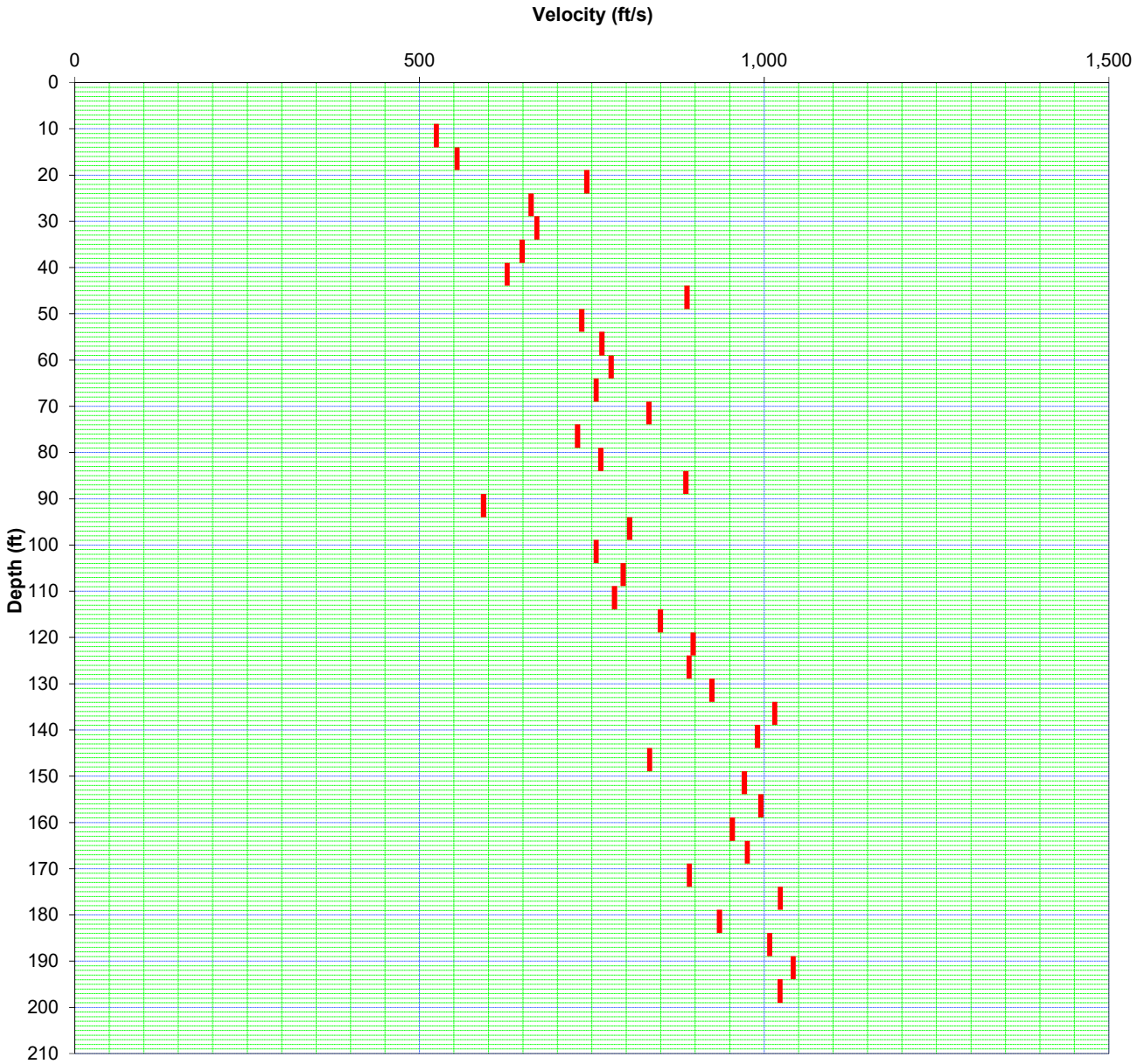
Job Number:	04.09200002	**CPT Number:**	CPT-20-003	**Coordinates:**	32.973928, -117.268763
Operator:	D. Garza	**Date:**	19-Feb-2020	**Cone Number:**	CP15-CF75PB7SN2-P1E1 2999
Location:	Del Mar, CA	**Elevation:**	0.00		



Robertson et al. 1986 *Overconsolidated or Cemented



CPT-20-003
SHEAR WAVE WAVEFORMS
CAMINO DEL MAR BRIDGE
DEL MAR, CALIFORNIA
KLEINFELDER



CPT-20-003
SHEAR WAVE VELOCITIES
CAMINO DEL MAR BRIDGE
DEL MAR, CALIFORNIA
KLEINFELDER

FUGRO

APPENDIX C
LABORATORY TEST RESULTS

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APPENDIX C
LABORATORY TEST RESULTS

Laboratory tests were performed on selected bulk and drive samples from our borehole explorations to estimate engineering characteristics of the various earth materials encountered. Testing was performed in accordance with ASTM and Caltrans standards and are presented in herein.

MOISTURE CONTENT AND DRY UNIT WEIGHT

Natural moisture content and dry unit weight tests were performed on selected bulk and drive samples collected from the boreholes in accordance with ASTM D2216 and D7263, respectively. The results are presented on the boring logs in Appendix A and in Appendix C as Figures C-1 through C-3.

GRADATION ANALYSIS

Sieve analyses were performed on selected samples of the materials encountered at the site to evaluate the gradation characteristics of the soil and to aid in classification. The tests were performed in general accordance with ASTM D1140 for percent finer than No. 200 sieve tests and ASTM D6913 for full gradation analyses. The results are presented in Appendix C as Figures C-4 through C-24.

ATTERBERG LIMITS

Atterberg limit tests were performed on fine-grained portions of selected soil samples to evaluate the plasticity characteristics (liquid limit, plastic limit, and plasticity index) of the soil and to aid in its classification. The tests were performed in general accordance with ASTM D4318. The results are presented in Appendix C as Figures C-25 and C-26.

TRIAXIAL COMPRESSION (UU) TEST

Three unconfined, unconsolidated (UU) triaxial compression tests were performed on selected soil samples from the borings performed at the site. The test procedures were performed in general accordance with the ASTM D2850. The results are presented in Appendix C as Figures C-27 through C-29.

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UNCONFINED COMPRESSION TEST

An unconfined compression test was performed on a soil sample from boring R-20-002. The test procedures were performed in general accordance with the ASTM D2166. The results are presented in Appendix C as Figure C-30.

R-VALUE

Two R-Value tests were performed on selected bulk samples to evaluate resistance values of the near surface soils. The tests were performed using modified effort in general accordance with ASTM D2844. The results are presented in Appendix C and Figures C-31 and C-32.

CORROSION TESTS

A series of chemical tests were performed on four selected bulk and driven samples of the near surface and at-depth soils to estimate pH, minimum resistivity, and sulfate and chloride contents. The test procedures were in general accordance with the California Tests 417, 422, and 643. The test results are provided in Appendix C as Figures C-33 through C-36.

DIRECT SHEAR TEST

Five direct shear strength tests were performed on selected driven soil samples from the borings. The test procedures were performed in general accordance with the ASTM D3080. The results are presented in Appendix C as Figures C-37 through C-41.

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Date Tested 3/16-20/2020

Boring No.	R-20-001	R-20-001	R-20-001	R-20-001	R-20-001
Sample No.	**S1**	**S3**	**S5**	**S6**	**S7**
Depth, ft.	**0.5-5**	**8-9.5**	**12-13.5**	**14-15.5**	**16-17.5**
Wet Weight, g	604.3	324.4	129.3	347.4	432.6
Dry Weight, g	587.1	309.4	113.2	278.3	340.1
Moisture Content, %	2.9	4.8	14.2	24.8	27.2
Sample Description	Dark brown poorly graded sand with silt	Brown poorly graded sand with silt	Dark brown poorly graded sand with silt	Dark gray poorly graded sand with silt	Dark gray poorly graded sand with silt

Boring No.	R-20-001	R-20-002	R-20-002	R-20-002	R-20-002
Sample No.	**S8**	**S1**	**S3**	**S5**	**S7**
Depth, ft.	**18-19.5**	**0.5-4**	**7-8.5**	**11-12.5**	**15-16.5**
Wet Weight, g	341.8	617.3	234.0	361.3	353.8
Dry Weight, g	272.3	594.4	224.4	297.9	279.6
Moisture Content, %	25.5	3.9	4.3	21.3	26.5
Sample Description	Dark gray poorly graded sand with silt	Dark brown poorly graded sand	Light gray poorly graded sand with silt	Dark brown poorly graded sand with silt	Dark gray poorly graded sand

Performed in General Accordance with ASTM D2216

KLEINFELDER
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CHECKED BY: J.B Tech T.C.

JOB NUMBER: 20180876.001A DATE: 6-Apr-20

Moisture Content Determination

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-1

Date Tested 3/16-20/2020

Boring No.	**R-20-002**				
Sample No.	**S8**				
Depth, ft.	**17-18.5**				
Wet Weight, g	349.6				
Dry Weight, g	276.1				
Moisture Content, %	26.6				
Sample Description	Dark gray poorly graded sand with silt				

Boring No.					
Sample No.					
Depth, ft.					
Wet Weight, g					
Dry Weight, g					
Moisture Content, %					
Sample Description					

Performed in General Accordance with ASTM D2216

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CHECKED BY: J.B. Tech T.C.

JOB NUMBER: 20180876.001A DATE: 2-Apr-20

Moisture Content Determination

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-2

Date Tested : 3/10-20/2020

Boring #	Sample #	Depth (ft)	Dry Density (pcf)	Moisture Content (%)	Description
R-20-001	S11	30-31.5	65.6	55.2%	Dark gray sandy clay
R-20-001	S13	50-51.5	110.3	20.6%	Gray silty sand
R-20-001	S15	60-61.5	101.5	24.5%	Gray silty sand
R-20-001	S17	70-71.5	108.3	21.1%	Gray poorly graded sand with silt
R-20-001	S19	80-81.5	106.7	20.5%	Gray poorly graded sand with silt
R-20-001	S25	110-111.5	92.1	31.5%	Gray silty sand
R-20-001	S27	120-121.5	102.7	25.1%	Gray silty sand
R-20-002	S10	25-26.5	99.9	26.4%	Dark gray silty sand
R-20-002	S12	35-36.5	101.3	24.2%	Dark gray silty sand
R-20-002	S18	65-66.5	96.0	28.9%	Dark gray poorly graded sand with silt
R-20-002	S14	45-46.5	105.3	23.5%	Dark gray poorly graded sand with silt
R-20-002	S16	55-56.5	92.2	36.7%	Dark gray poorly graded sand with silt
R-20-002	S20	75-76.5	95.5	29.9%	Dark gray poorly graded sand with silt
R-20-002	S30	125-126.5	94.2	30.5%	Dark gray silty sand
R-20-002	S34	145-146.5	91.9	28.7%	Dark gray silty sand
R-20-002	S24	95-96.5	94.5	28.1%	Dark gray silty sand
R-20-002	S28	115-116.5	104.4	29.4%	Dark gray silty sand
R-20-002	S41	181-181.5	106.6	17.9%	Dark gray silty sand

Performed in General Accordance with ASTM D7263 B and D2216

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CHECKED BY: J.B. TECH: M.S.L

JOB NUMBER: 20180876.001A DATE: 2-Apr-20

Dry Density and Moisture Content

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-3

Date Tested 3/10-20/2020

Boring No	R-20-001	R-20-001	R-20-001	R-20-001	R-20-001
Sample No.	S3	S7	S12	S25	S31
Depth, ft.	8-9.5	16-17.5	35-36.5	110-111.5	150-151
Dry Weight before wash, g	309.4	340.1	148.2	265.4	235.1
Dry Weight After Wash, g	274.4	326.9	56.6	242.8	68.2
Weight Loss, No. 200, g	35.0	13.2	91.6	22.6	166.9
Wash No. 200, %	**11.3**	**3.9**	**61.8**	**8.5**	**71.0**
Sample Description	Brown poorly graded sand with silt	Dark gray poorly graded sand	Dark gray sandy fat clay	Dark gray poorly graded sand with silt	Gray brown sandy fat clay

Boring No	R-20-002	R-20-002	R-20-002	R-20-002	R-20-002
Sample No.	S3	S7	S11	S17	S21
Depth, ft.	7-8.5	15-16.5	30-31.5	60-61.5	80-81.5
Dry Weight before wash, g	224.4	279.6	255.2	318.5	286.4
Dry Weight After Wash, g	211.9	270.6	235.9	282.5	170.6
Weight Loss, No. 200, g	12.5	9.0	19.3	36.0	115.8
Wash No. 200, %	**5.6**	**3.2**	**7.6**	**11.3**	**40.4**
Sample Description	Light gray poorly graded sand with silt	Dark gray poorly graded sand	Dark gray poorly graded sand with silt	Dark gray poorly graded sand with silt	Dark gray silty sand

Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

TEST PERFORMED IN ACCORDANCE WITH ASTM D 1140

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Materials Finer than 75 um (No 200) Sieve

FIGURE

C-4

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

CHECKED BY: J.B. Tech T.C.

JOB NUMBER: 20180876.001A DATE: 1-Apr-20

Date Tested 3/10-20/2020

Boring No	R-20-002	R-20-002			
Sample No.	S23	S33			
Depth, ft.	90-91.5	140-141.5			
Dry Weight before wash, g	253.5	288.9			
Dry Weight After Wash, g	78.3	180.2			
Weight Loss, No. 200, g	175.2	108.7			
Wash No. 200, %	**69.1**	**37.6**			
Sample Description	Dark gray sandy clay	Dark gray silty sand			

Boring No					
Sample No.					
Depth, ft.					
Dry Weight before wash, g					
Dry Weight After Wash, g					
Weight Loss, No. 200, g					
Wash No. 200, %					
Sample Description					

Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

TEST PERFORMED IN ACCORDANCE WITH ASTM D 1140

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CHECKED BY: J.B. Tech T.C.

JOB NUMBER: 20180876.001A DATE: 1-Apr-20

Materials Finer than 75 um (No 200) Sieve

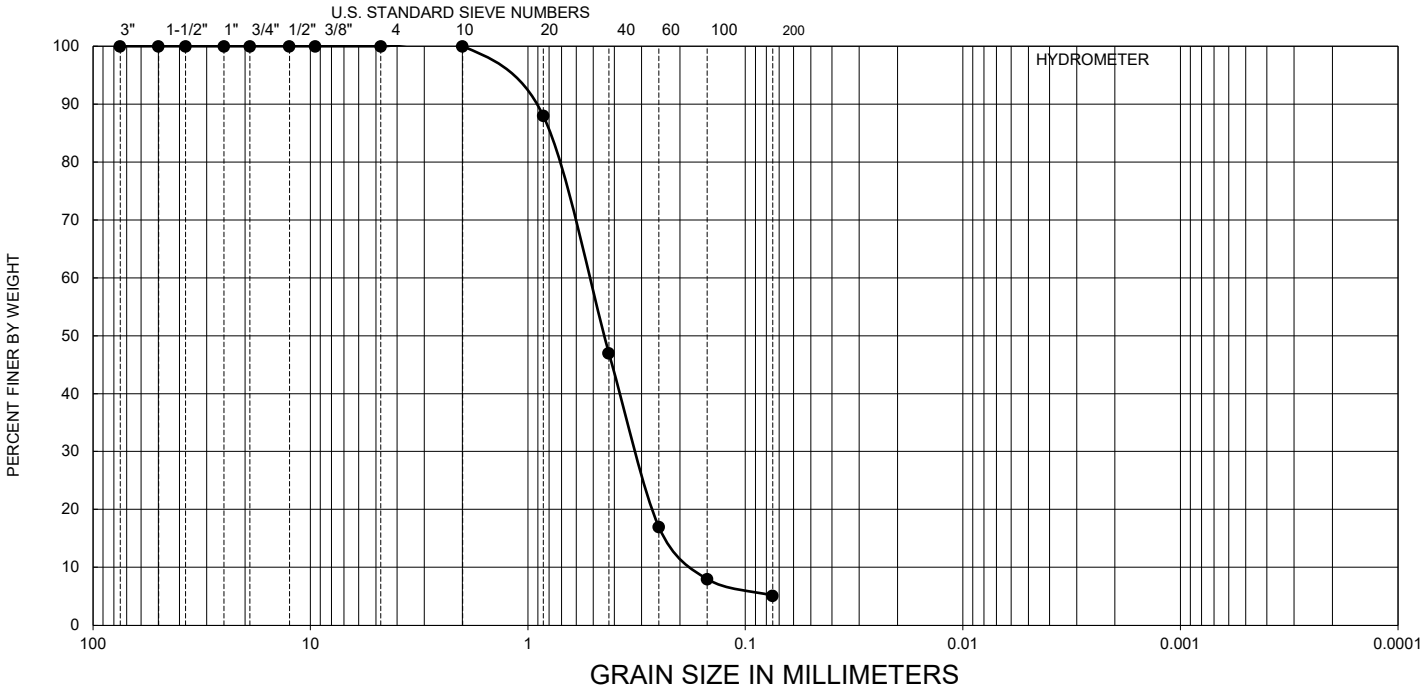
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-5

Date Tested: **3/12/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S1	0.5-5	5.1	SP-SM

Sample Description	Dark brown Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	88
No. 40	0.425 mm	47
No. 60	0.25 mm	17
No 100	0.15 mm	8
No 200	.075 mm	5.1

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Checked by:	J.B.	Tech:	T.C.
Project No.	20180876.001A	Date:	1-Apr-20

GRADATION TEST RESULTS

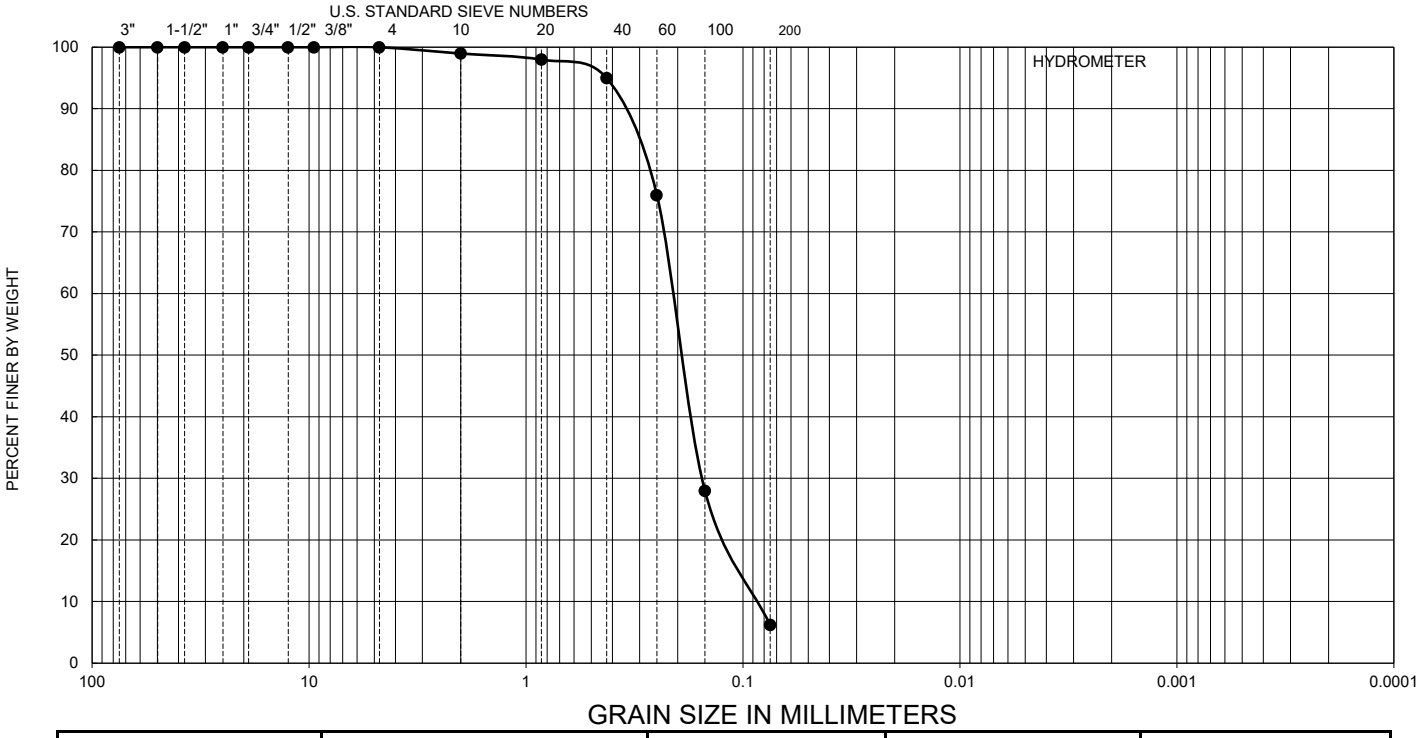
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-6

Date Tested: **3/12/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S5	12-13.5	6.2	SP-SM

Sample Description	Dark brown Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	99
No. 20	0.85 mm	98
No. 40	0.425 mm	95
No. 60	0.25 mm	76
No 100	0.15 mm	28
No 200	.075 mm	6.2

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

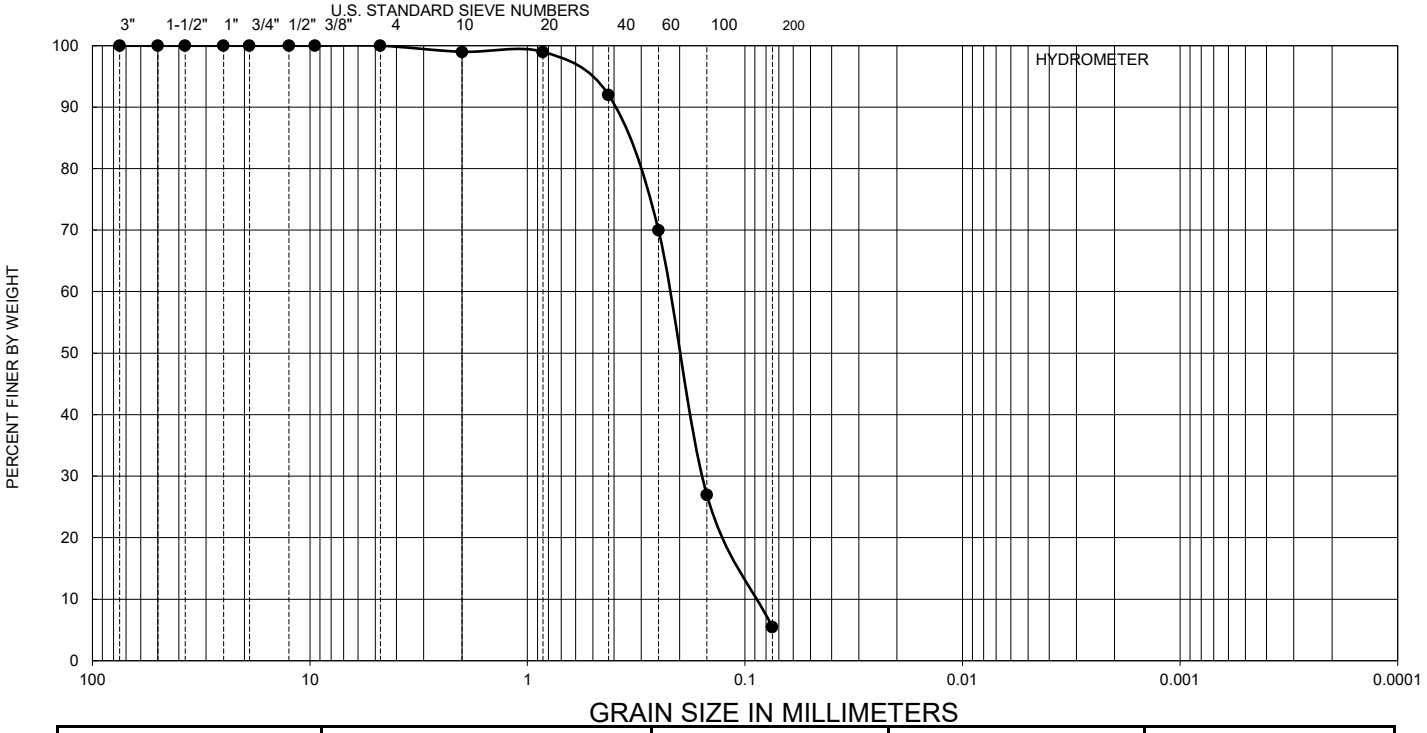
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-7

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S9	20-21.5	5.5	SP-SM

Sample Description	Dark brown Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	99
No. 20	0.85 mm	99
No. 40	0.425 mm	92
No. 60	0.25 mm	70
No 100	0.15 mm	27
No 200	.075 mm	5.5

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Checked by:	J.B.	Tech:	T.C.
Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

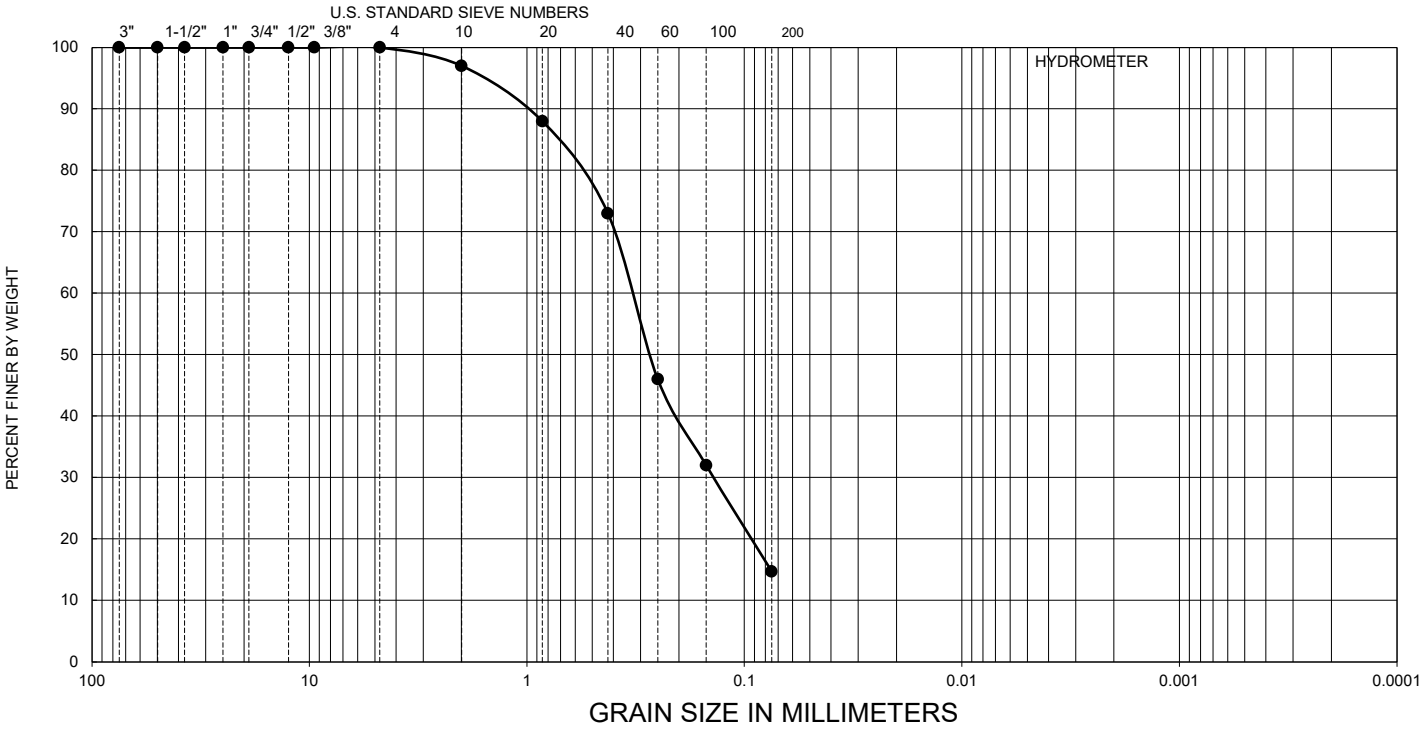
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-8

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S13	50-51.5	14.7	SM

Sample Description	Dark brown Silty sand

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	97
	No. 20	0.85 mm	88
	No. 40	0.425 mm	73
	No. 60	0.25 mm	46
	No 100	0.15 mm	32
	No 200	.075 mm	14.7

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Checked by:	J.B.	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

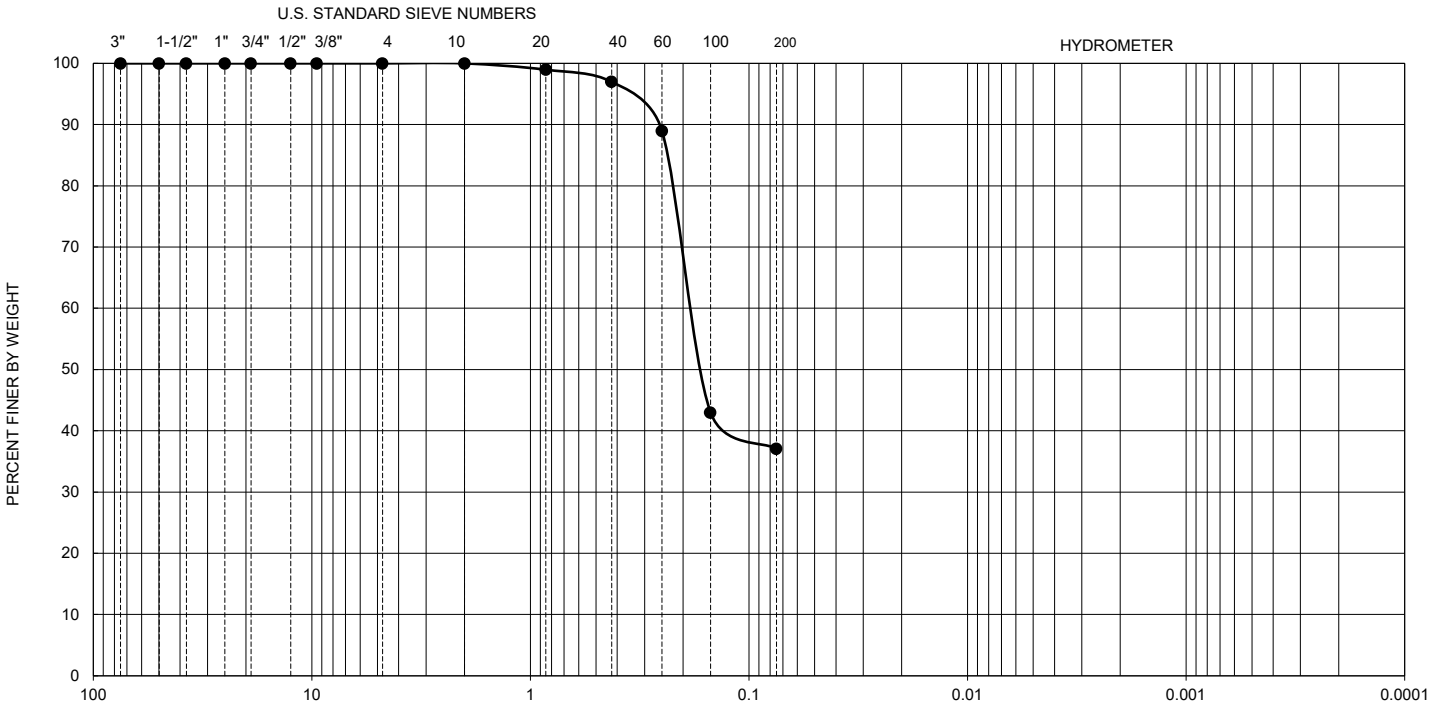
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-9

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S15	60-61.5	37.1	SM

Sample Description	Dark gray Silty sand

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	99
	No. 40	0.425 mm	97
	No. 60	0.25 mm	89
	No 100	0.15 mm	43
	No 200	.075 mm	37.1

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Checked by:	J.B	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

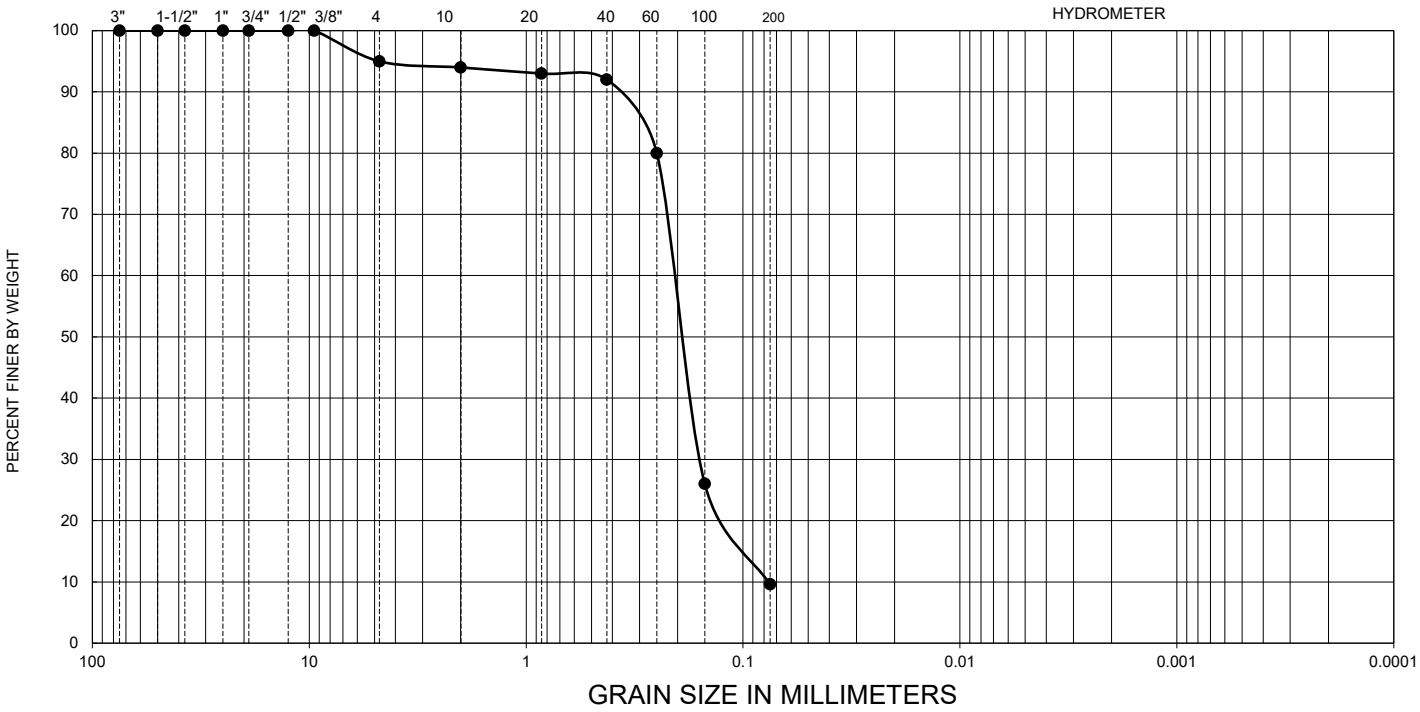
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-10

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S17	70-71.5	9.6	SP-SM

Sample Description	Dark gray Poorly graded sand with silt

	Sieve Size		% Passing
Sieve Analysis	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	95
	No. 10	2.0 mm	94
	No. 20	0.85 mm	93
	No. 40	0.425 mm	92
	No. 60	0.25 mm	80
	No 100	0.15 mm	26
	No 200	.075 mm	9.6

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Checked by:	J.B.	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

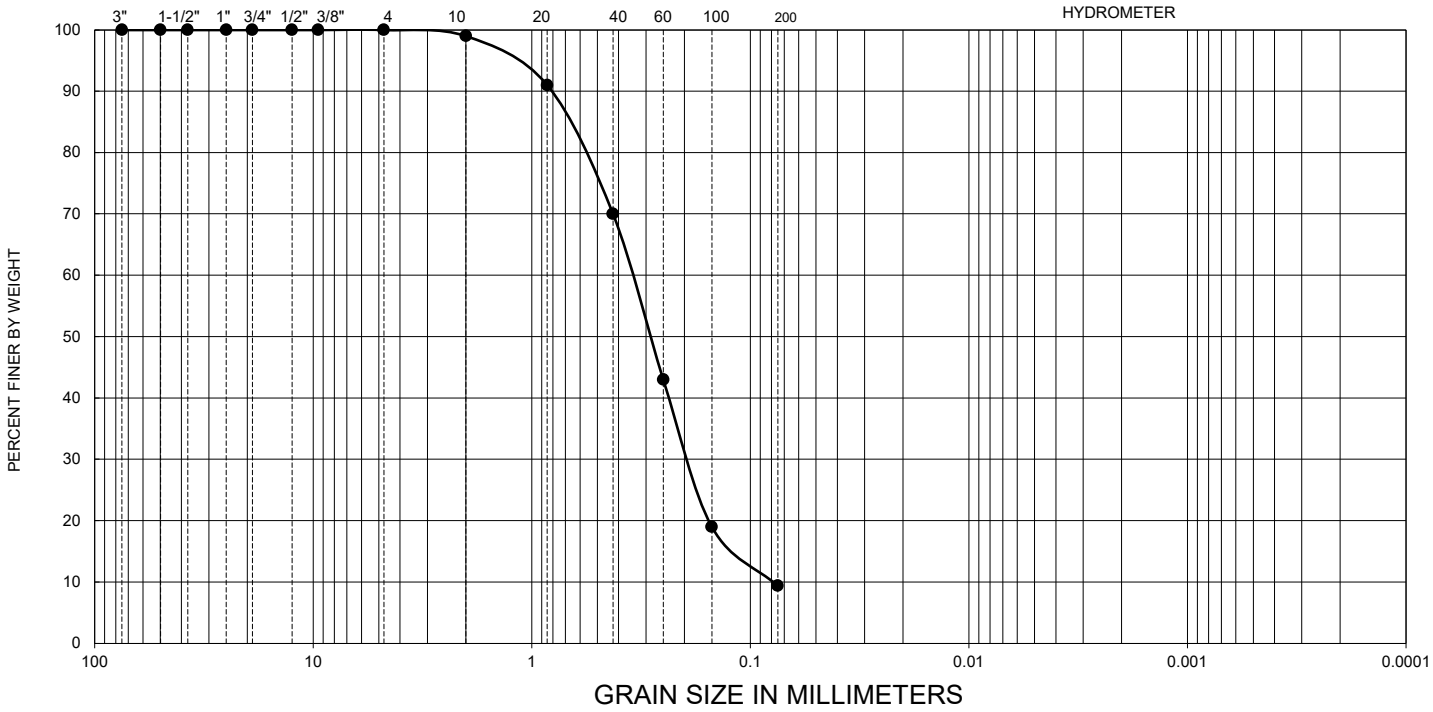
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-11

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S19	80-81.5	9.4	SP-SM

Sample Description	Dark gray Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	99
No. 20	0.85 mm	91
No. 40	0.425 mm	70
No. 60	0.25 mm	43
No 100	0.15 mm	19
No 200	.075 mm	9.4

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Checked by:	J.B.	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

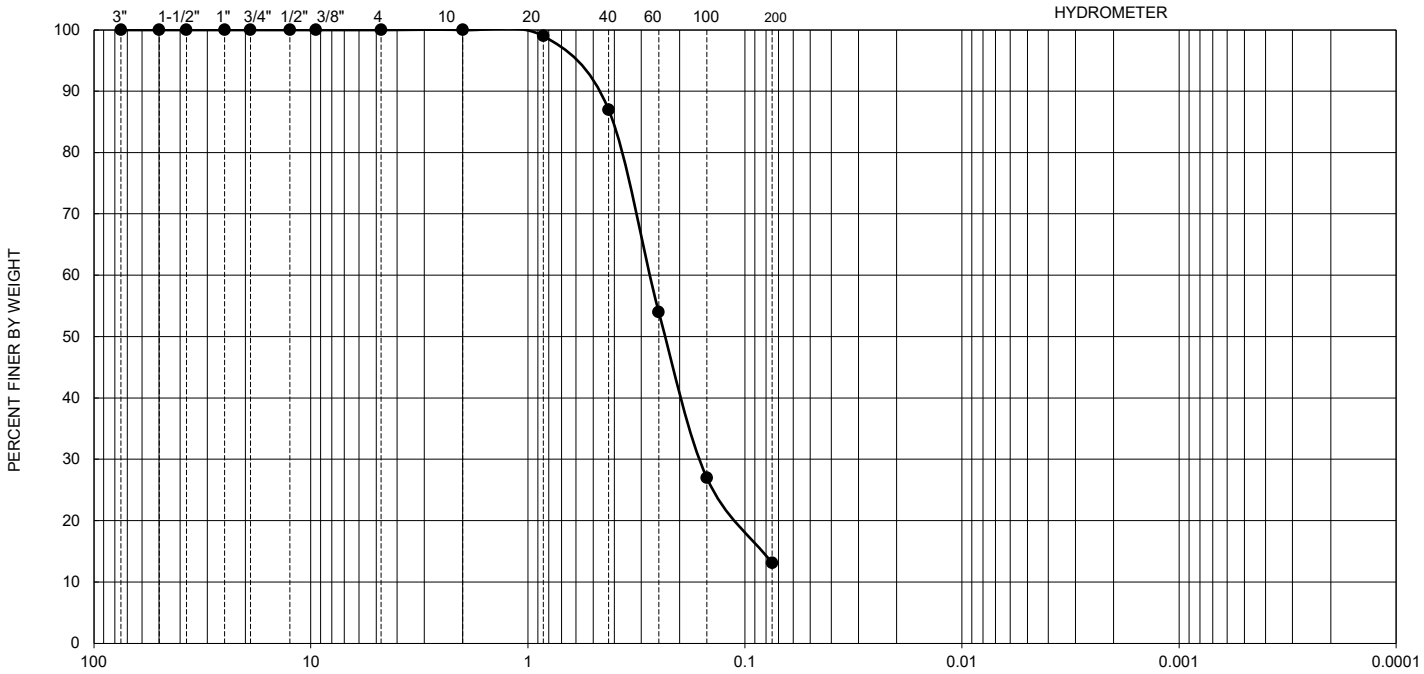
FIGURE

C-12

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

U.S. STANDARD SIEVE NUMBERS



GRAIN SIZE IN MILLIMETERS

Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-001	S27	120-121.5	13.1	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	99
No. 40	0.425 mm	87
No. 60	0.25 mm	54
No 100	0.15 mm	27
No 200	.075 mm	13.1

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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GRADATION TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

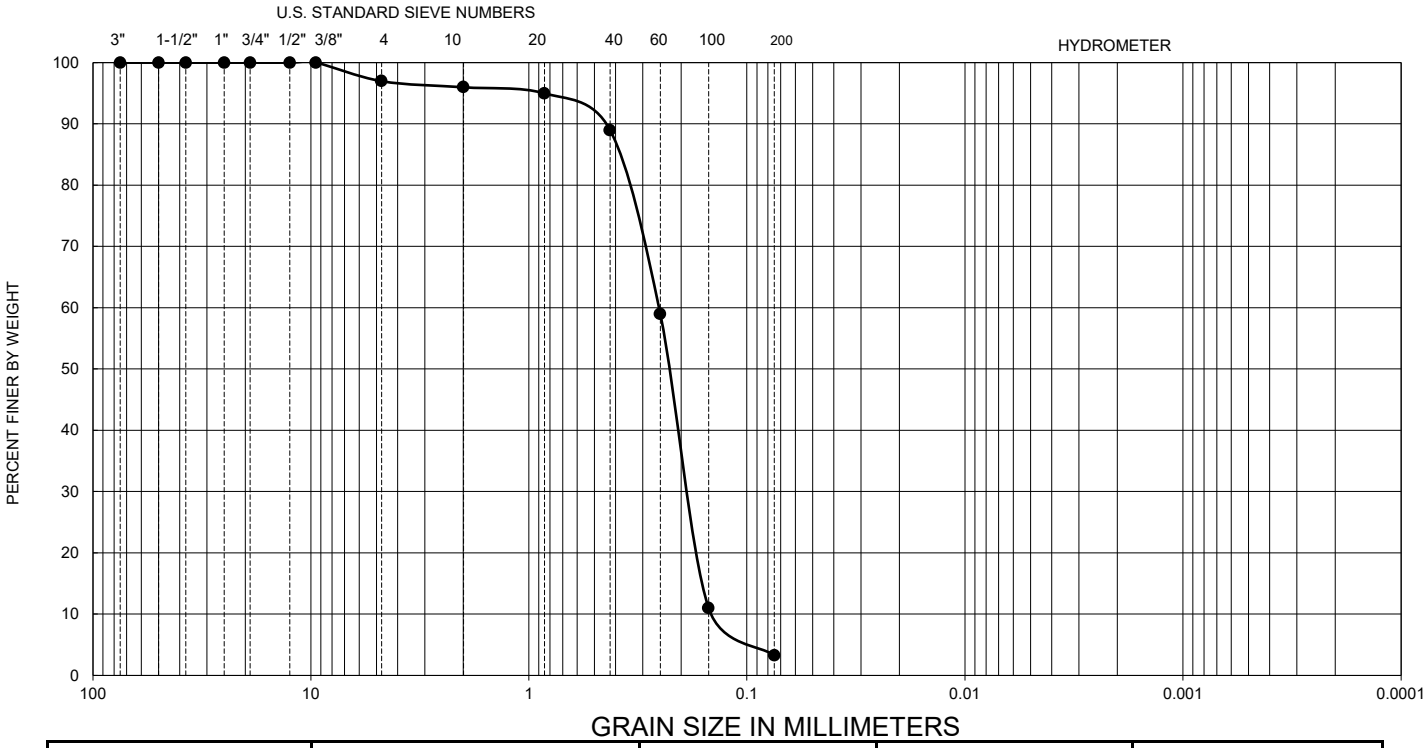
FIGURE

C-13

Checked by:	J.B.	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S1	0.5-4	3.3	SP

Sample Description	Brown Poorly graded sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	97
No. 10	2.0 mm	96
No. 20	0.85 mm	95
No. 40	0.425 mm	89
No. 60	0.25 mm	59
No 100	0.15 mm	11
No 200	.075 mm	3.3

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Checked by:	J.B.	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

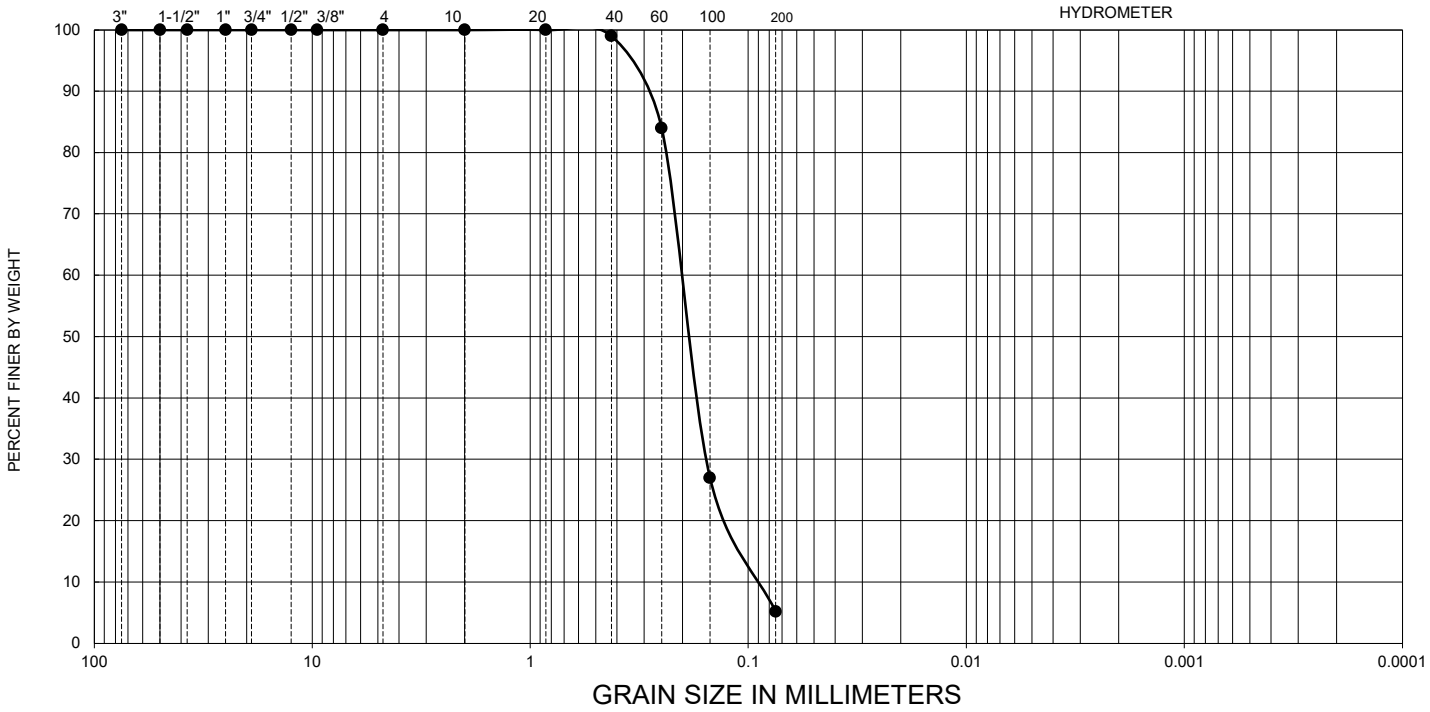
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-14

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S5	11-12.5	5.2	SP-SM

Sample Description	Dark gray Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	100
No. 40	0.425 mm	99
No. 60	0.25 mm	84
No 100	0.15 mm	27
No 200	.075 mm	5.2

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

KLEINFELDER
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Checked by:	J.B.	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

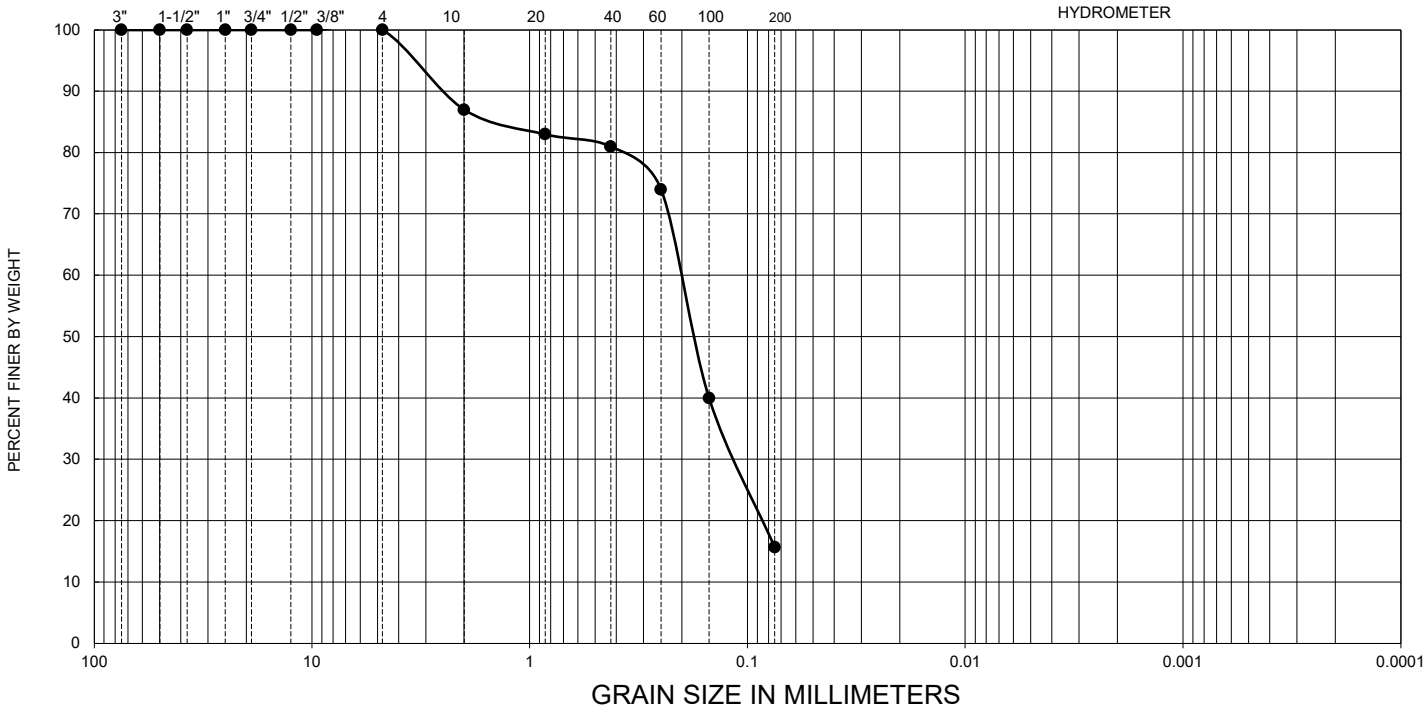
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-15

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S9	21-22.5	15.7	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	87
No. 20	0.85 mm	83
No. 40	0.425 mm	81
No. 60	0.25 mm	74
No 100	0.15 mm	40
No 200	.075 mm	15.7

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

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Checked by:	J.B.	Tech:	MSL
Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

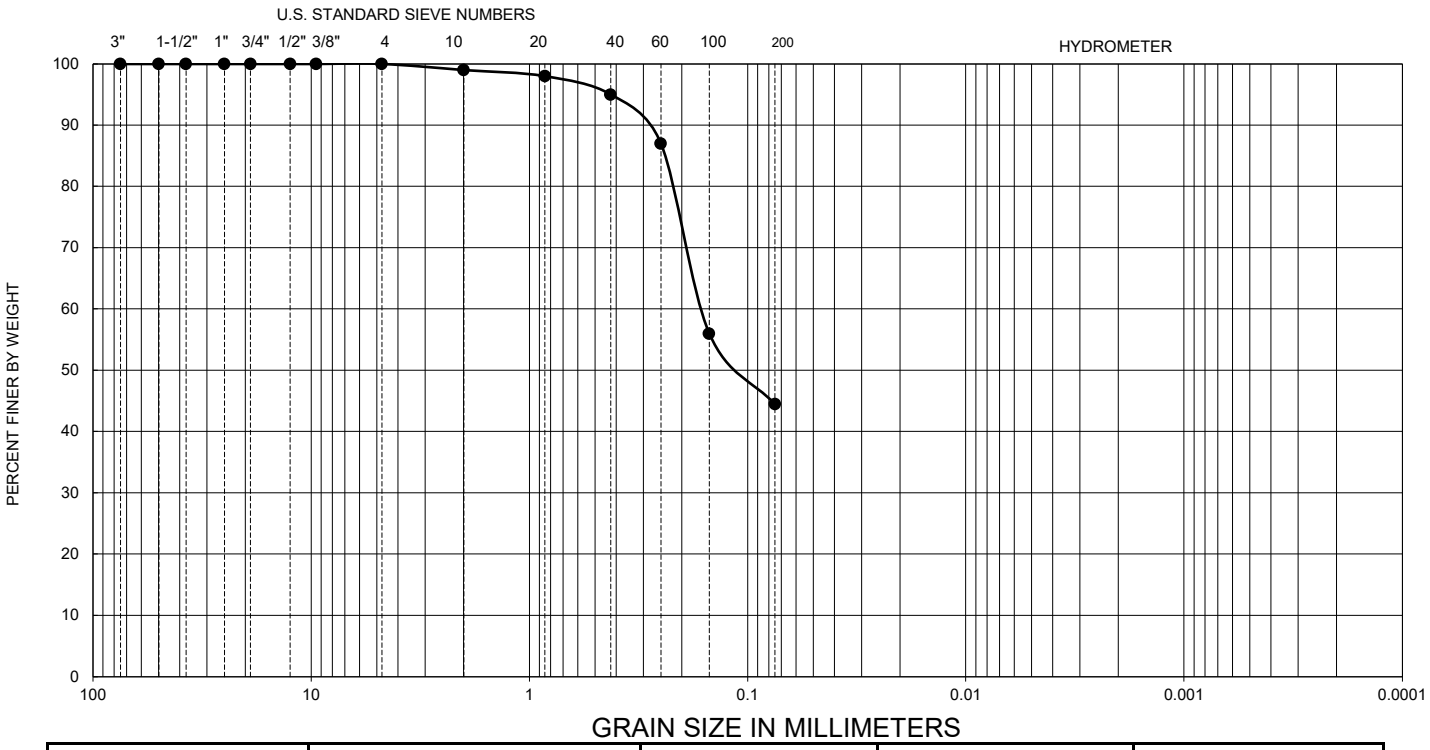
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-16

Date Tested: **3/12/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S13	40-41.5	44.5	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	99
No. 20	0.85 mm	98
No. 40	0.425 mm	95
No. 60	0.25 mm	87
No 100	0.15 mm	56
No 200	.075 mm	44.5

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

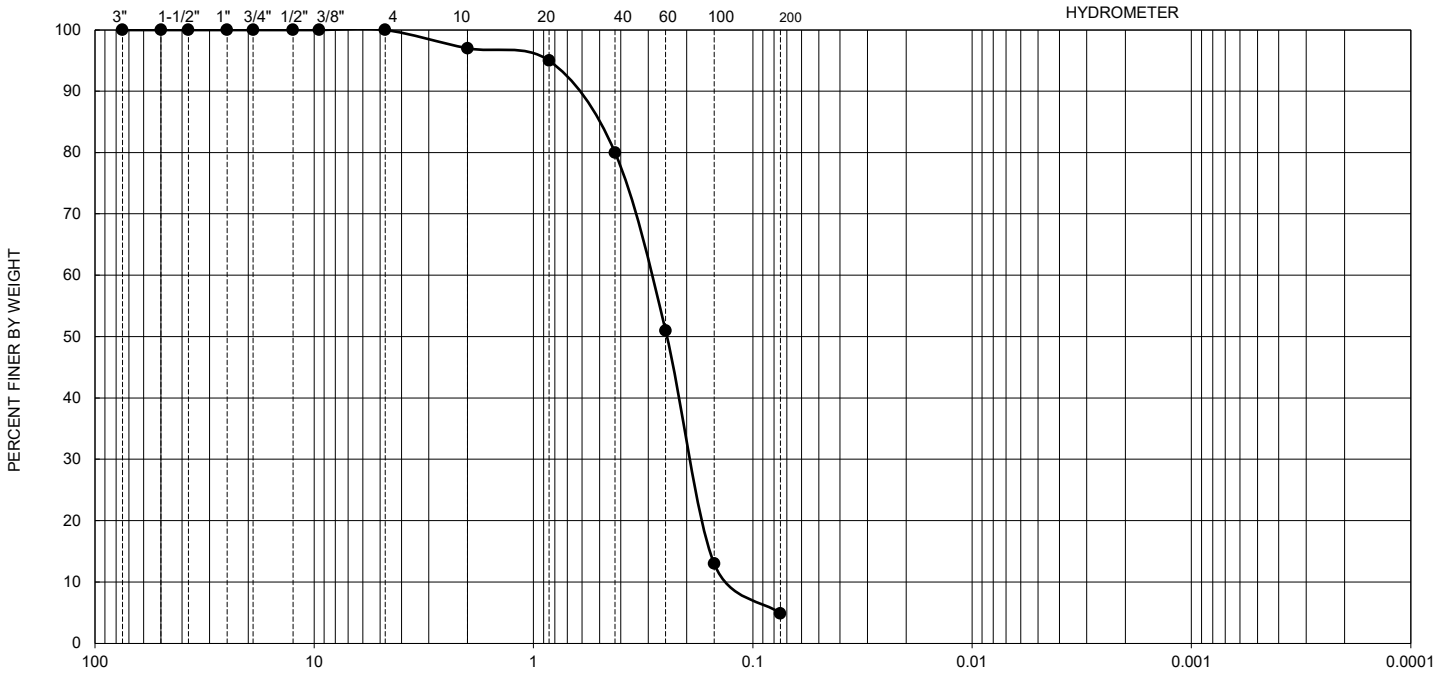
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-17

Date Tested: **3/12/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S15	50-51.5	4.9	SP

Sample Description	Dark gray Poorly graded sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	97
No. 20	0.85 mm	95
No. 40	0.425 mm	80
No. 60	0.25 mm	51
No 100	0.15 mm	13
No 200	.075 mm	4.9

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Project No.	20180876.001A	Date:	2-Apr-20

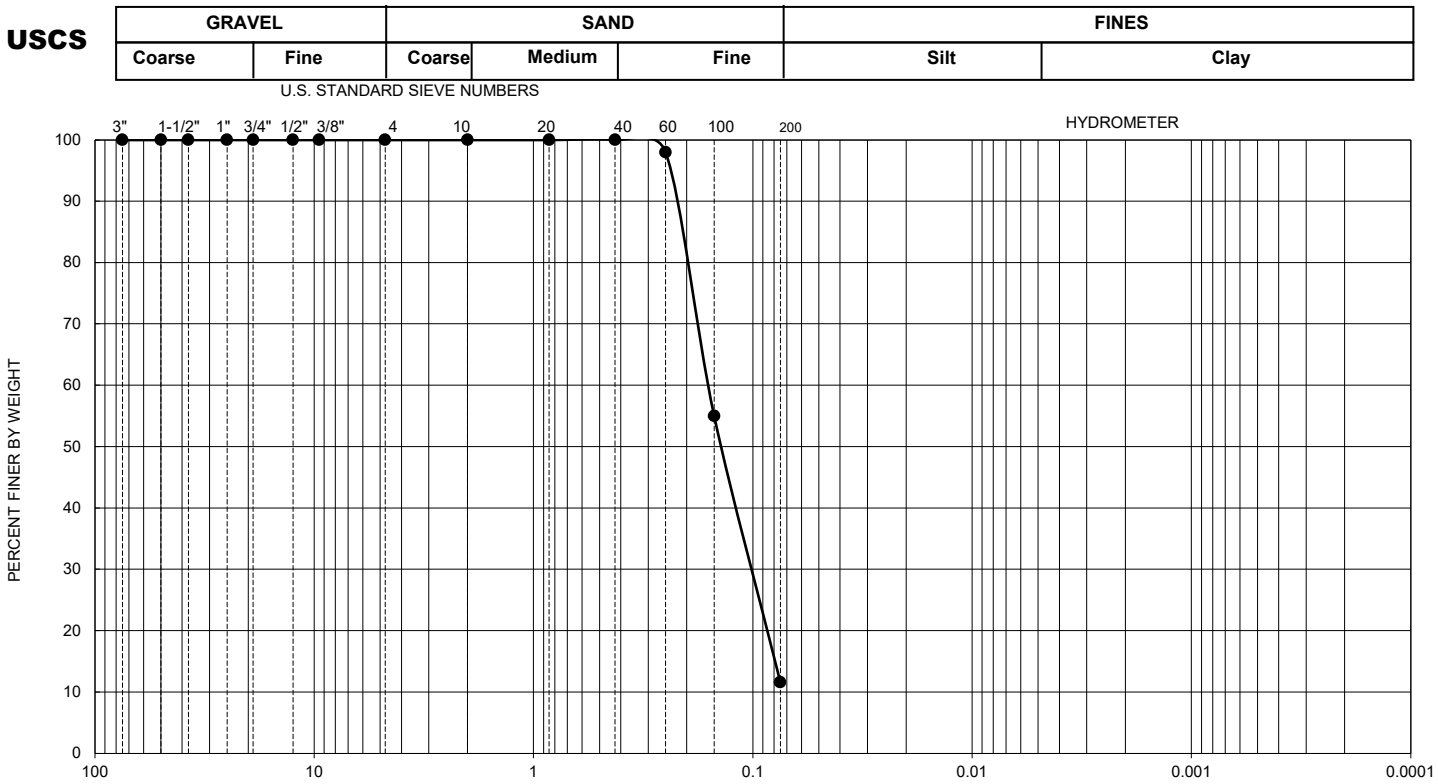
GRADATION TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-18

Date Tested: **3/12/2020**



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S19	70-71.5	11.6	SP-SM

Sample Description	Dark gray Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	100
No. 40	0.425 mm	100
No. 60	0.25 mm	98
No 100	0.15 mm	55
No 200	.075 mm	11.6

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GRADATION TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

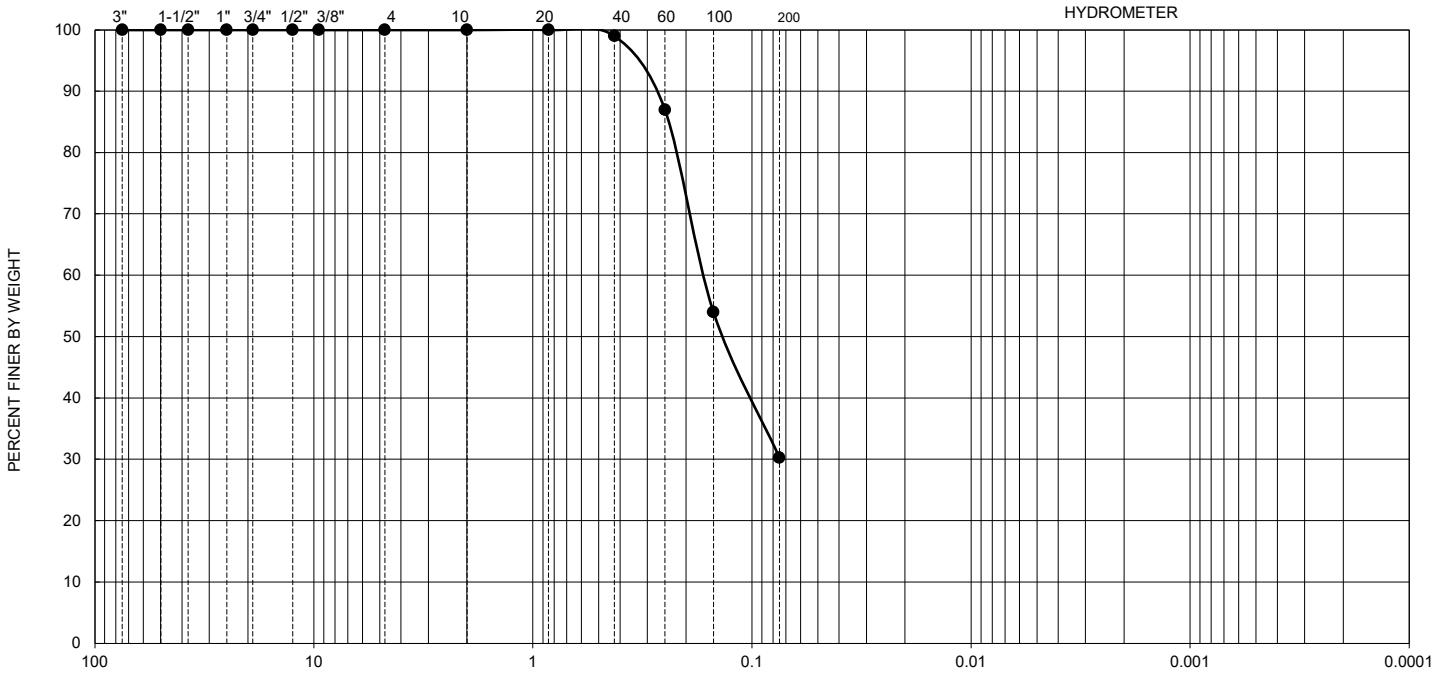
FIGURE

C-19

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

U.S. STANDARD SIEVE NUMBERS



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S25	100-101.5	30.3	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	100
No. 40	0.425 mm	99
No. 60	0.25 mm	87
No 100	0.15 mm	54
No 200	.075 mm	30.3

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

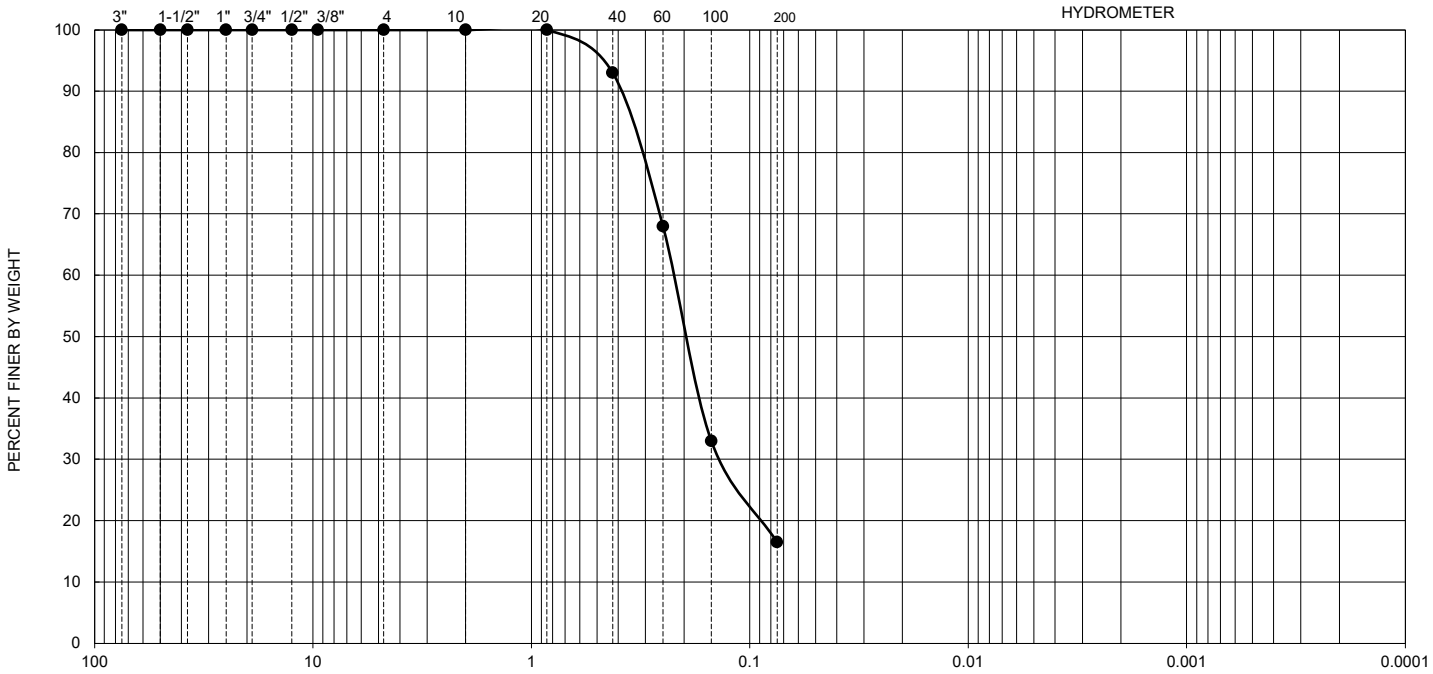
FIGURE

C-20

Date Tested: **3/11/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

U.S. STANDARD SIEVE NUMBERS



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	S27	110-111.5	16.5	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	100
No. 40	0.425 mm	93
No. 60	0.25 mm	68
No 100	0.15 mm	33
No 200	.075 mm	16.5

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

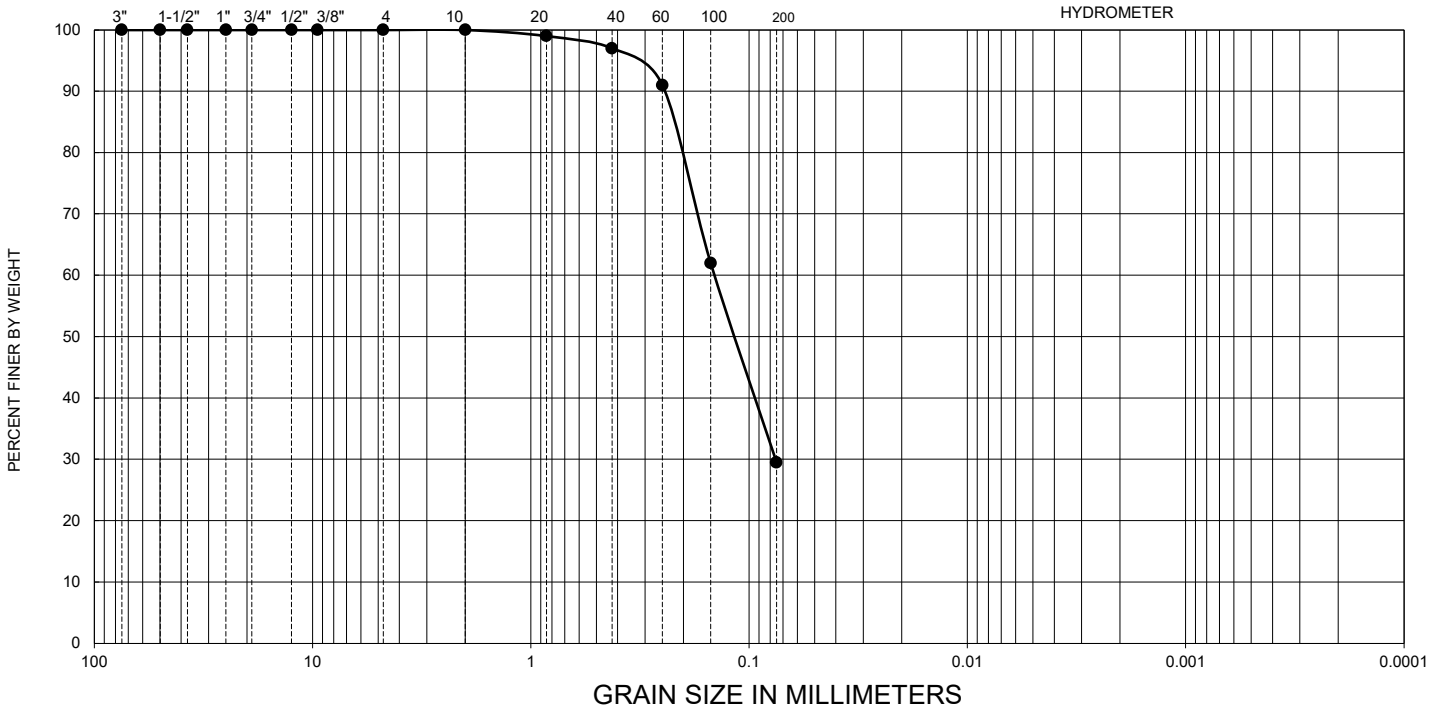
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-21

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	30	125-126.5	29.5	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	99
No. 40	0.425 mm	97
No. 60	0.25 mm	91
No 100	0.15 mm	62
No 200	.075 mm	29.5

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

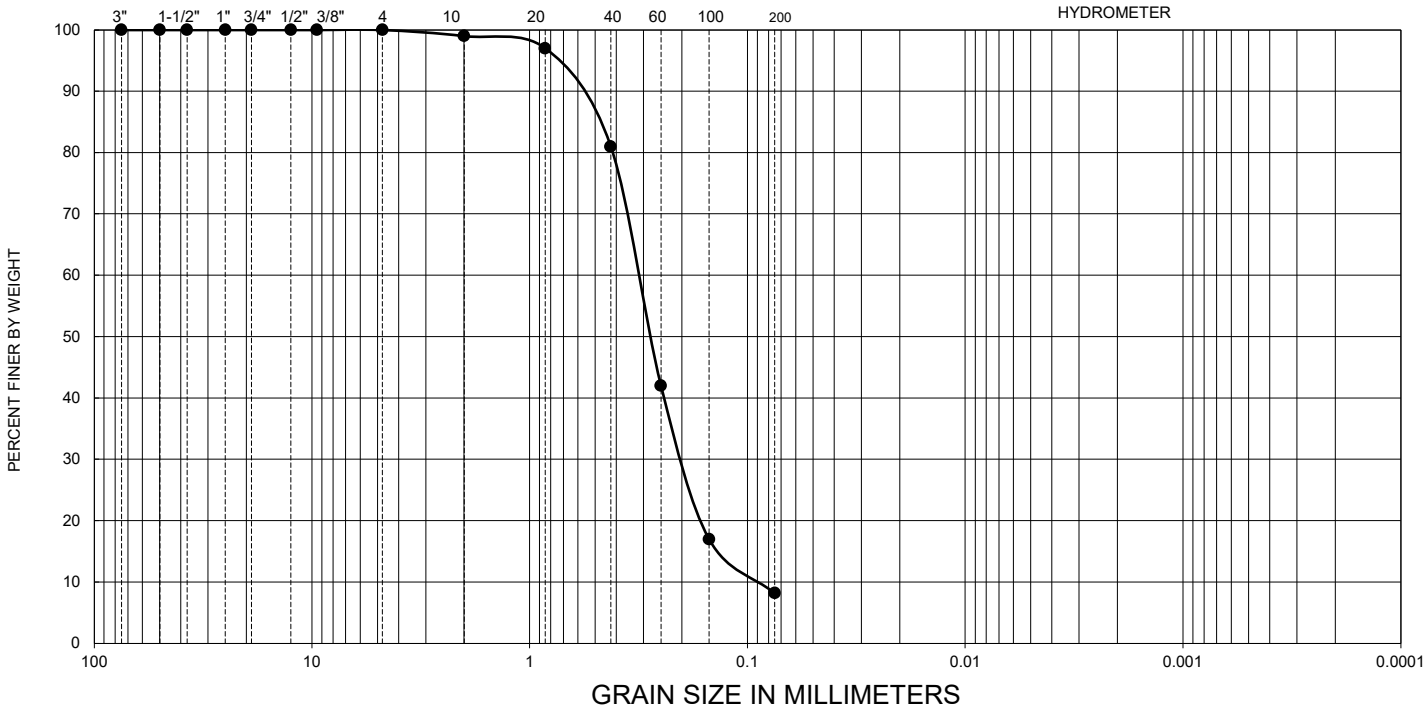
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-22

Date Tested: **3/19/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	35	150-151.5	8.2	SP-SM

Sample Description	Dark gray Poorly graded sand with silt

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	99
No. 20	0.85 mm	97
No. 40	0.425 mm	81
No. 60	0.25 mm	42
No 100	0.15 mm	17
No 200	.075 mm	8.2

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

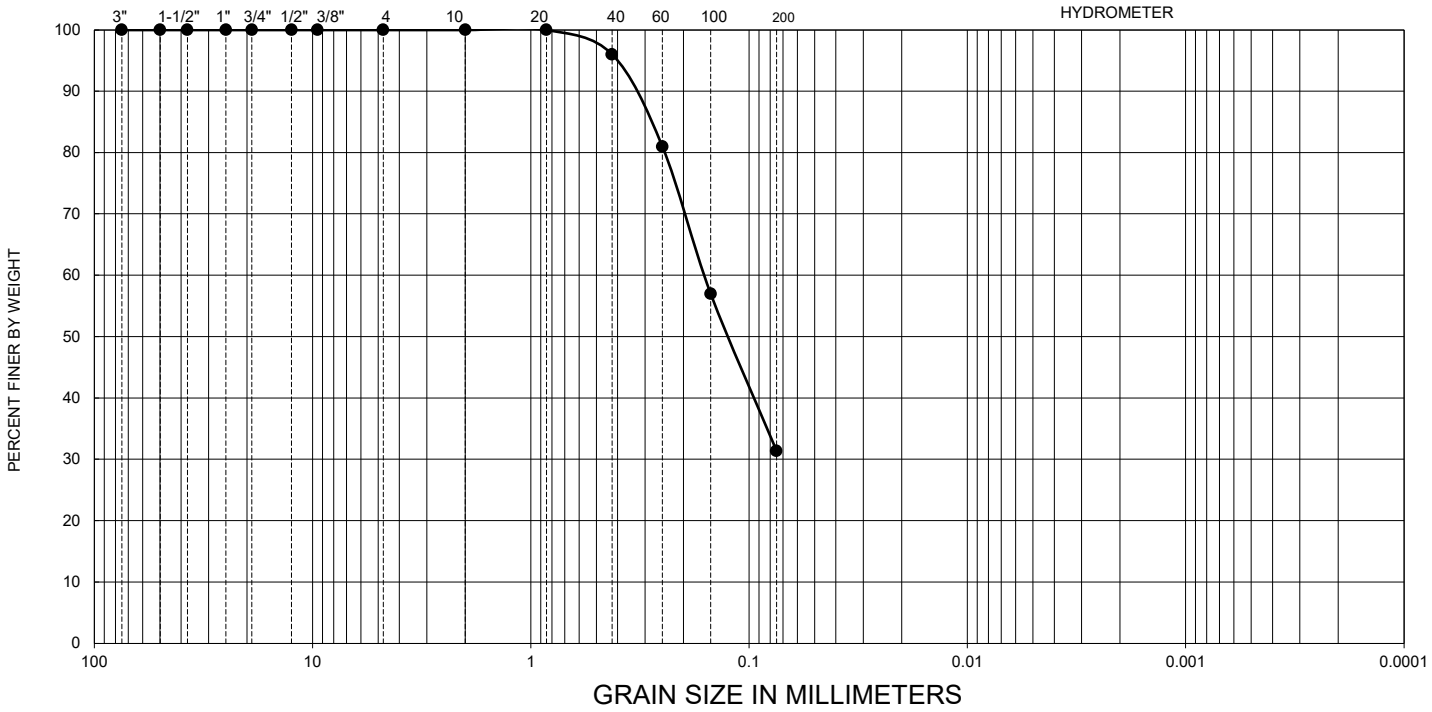
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-23

Date Tested: **3/12/2020**

USCS	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
R-20-002	37	170-171.5	31.4	SM

Sample Description	Dark gray Silty sand

Sieve Analysis

Sieve Size		% Passing
3"	75 mm	100
2"	50 mm	100
1.5"	37.5 mm	100
1"	25 mm	100
3/4"	19 mm	100
1/2"	12.5 mm	100
3/8"	9.5 mm	100
No. 4	4.75 mm	100
No. 10	2.0 mm	100
No. 20	0.85 mm	100
No. 40	0.425 mm	96
No. 60	0.25 mm	81
No 100	0.15 mm	57
No 200	.075 mm	31.4

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Project No.	20180876.001A	Date:	2-Apr-20

GRADATION TEST RESULTS

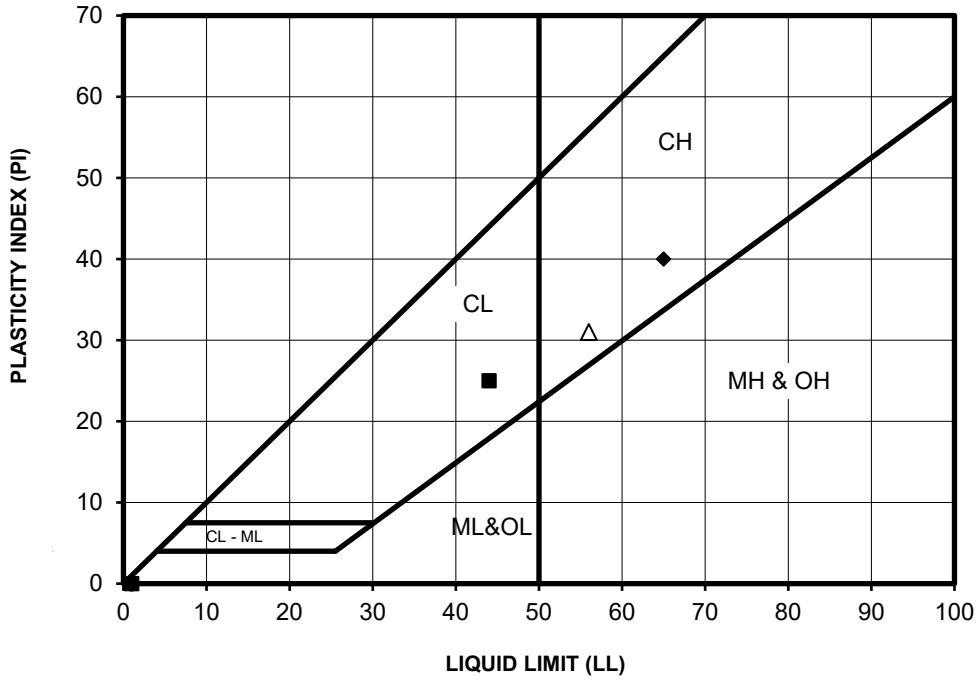
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

C-24

Date Tested: 3/12/2020 to 3/24/2020

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	R-20-001/S5	12-13.5	NP	NP	NP	ML	SP-SM
■	R-20-001/S11	30-31.5	44	19	25	CL	CL
◆	R-20-001/S12	35-36.5	65	25	40	CH	CH
○	R-20-001/S15	60-61.5	NP	NP	NP	ML	SM
□	R-20-001/S18	75-76.5	NP	NP	NP	ML	SP-SM
△	R-20-001/S31	150-151	56	25	31	CH	CH
+	R-20-002/S3	7-8.5	NP	NP	NP	ML	SM
◇	R-20-002/S9	21-22.5	NP	NP	NP	ML	SP-SM



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ATTERBERG LIMITS TEST RESULTS

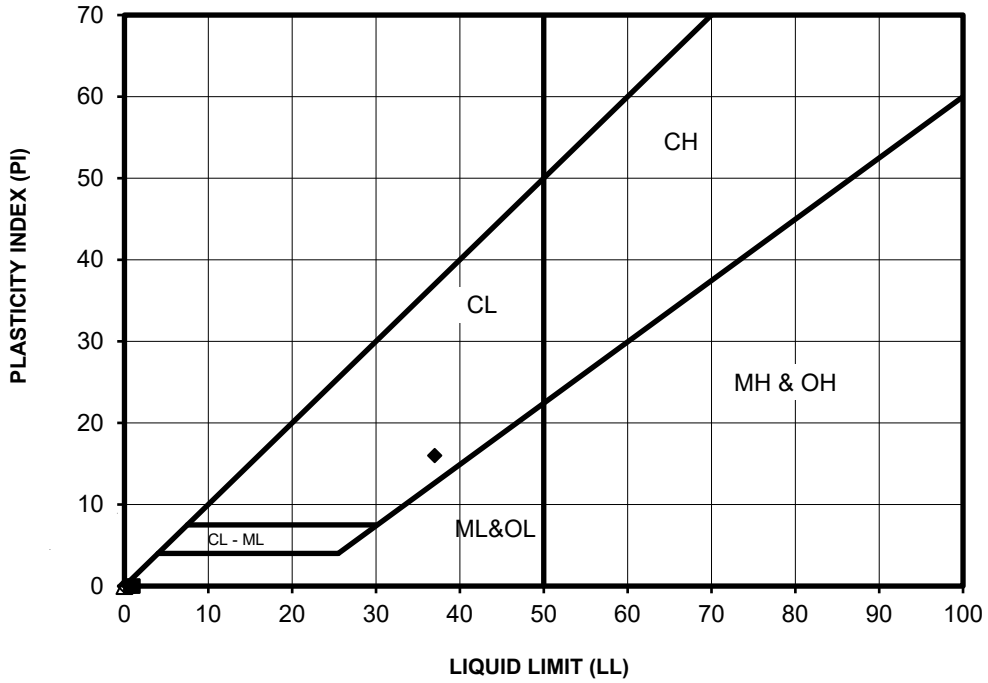
Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE
C-25

Checked by	J.B.	TECH	UP/TC/RH
PROJECT NO:	20180876.001A	2-Apr-20	

Date Tested: 3/16/2020 to 3/18/2020

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	R-20-002/S15	50-51.5	NP	NP	NP	ML	SP
■	R-20-002/S21	80-81.5	NP	NP	NP	ML	SM
◆	R-20-002/S23	90-91.5	37	21	16	CL	CL
○	R-20-002/S27	110-111.5	NP	NP	NP	ML	SM
□	R-20-002/S33	140-141.5	NP	NP	NP	ML	SM



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ATTERBERG LIMITS TEST RESULTS

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

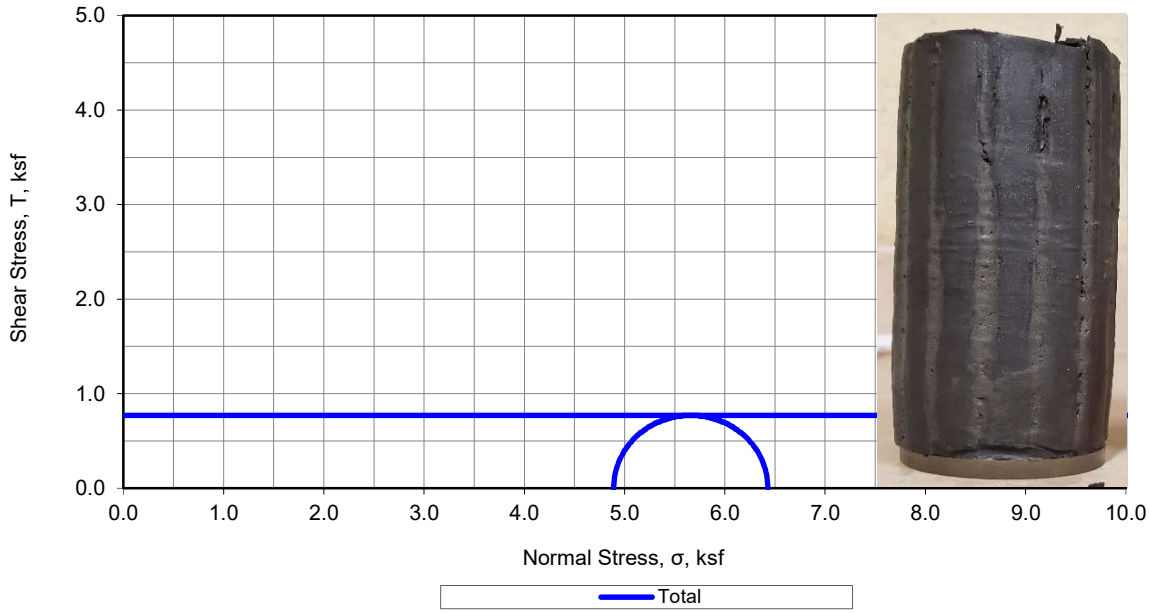
FIGURE

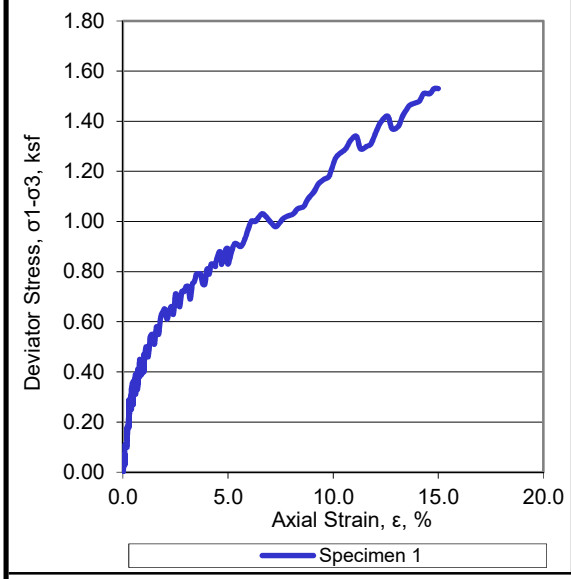
C-26

Checked by	J.B	TECH	UP/TC/RH
PROJECT NO:	20180876.001A	2-Apr-20	

Total	
c = 0.77	ksf

Specimen Shear Picture





Specimen No.			1
Initial	Diameter, in	D_O	2.40
	Height, in	H_O	5.49
	Water Content, %	ω_O	46.5
	Dry Density, lbs/ft^3	$^{\gamma}d_o$	76.6
	Saturation, %	S_O	106
	Void Ratio	e_O	1.159
Minor Principal Stress, ksf		σ_3	4.90
Maximum Deviator Stress, ksf		$(\sigma 1-\sigma 3)_{max}$	1.53
Time to $(\sigma_1-\sigma_3)_{max}$, min		t_f	14.85
Deviator Stress @ 15% Axial Strain, ksf		$(\sigma_1-\sigma_3)_{15\%}$	1.53
Ultimate Deviator Stress, ksf		$(\sigma_1-\sigma_3)_{ult}$	na
Rate of strain, %/min		$'\varepsilon$	1.00
Axial Strain at Failure, %		ε_f	14.85

Description of Specimen: Black Fat Clay (CH)

Amount of Material Finer than the No. 200, %: 88

LL:	PL:	PI:	G_S:	Specimen Type:	Test Method:
56	24	32	2.65 Assumed	Undisturbed	ASTM D2850

Membrane correction applied

Boring:	R-20-001
Sample:	S21
Depth, ft:	91.0
Test Date:	3/16/20

Remarks: nm= not measured, na = not applicable

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Project No.:	20180876.001A
Date:	3/20/20
Entry By:	CP
Checked By:	CP
File Name:	HL12966

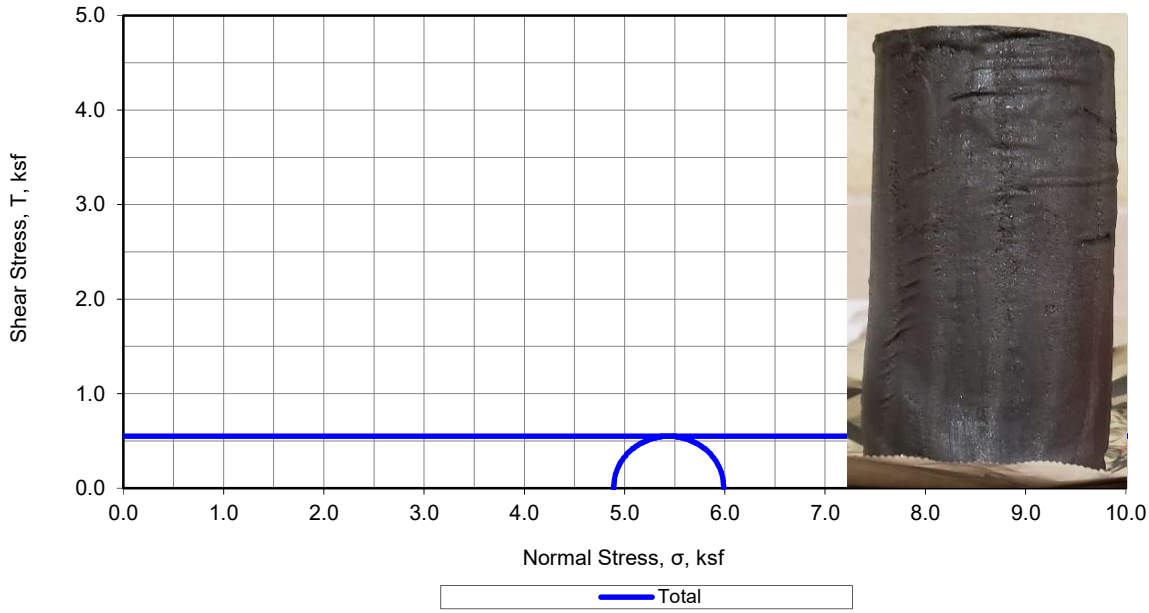
TRIAXIAL COMPRESSION TEST (UU)

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

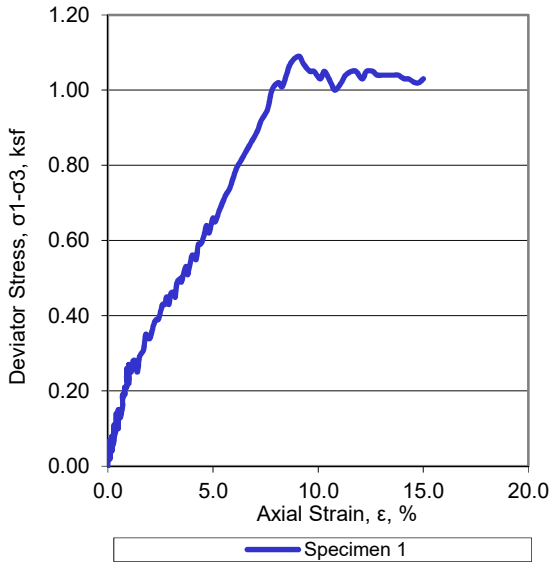
Figure

C-27

Total	
c = 0.55	ksf



Specimen Shear Picture



Specimen No.			1
Initial	Diameter, in	D_O	2.39
	Height, in	H_O	5.38
	Water Content, %	ω_O	48.2
	Dry Density, lbs/ft^3	$^{\gamma}d_o$	73.8
	Saturation, %	S_O	103
	Void Ratio	e_O	1.240
Minor Principal Stress, ksf		σ_3	4.90
Maximum Deviator Stress, ksf		$(\sigma 1-\sigma 3)_{max}$	1.09
Time to $(\sigma_1-\sigma_3)_{max}$, min		t_f	9.08
Deviator Stress @ 15% Axial Strain, ksf		$(\sigma_1-\sigma_3)_{15\%}$	1.03
Ultimate Deviator Stress, ksf		$(\sigma_1-\sigma_3)_{ult}$	na
Rate of strain, %/min		'ε	1.00
Axial Strain at Failure, %		ε_f	9.08

Description of Specimen: Black Silt (ML)

Amount of Material Finer than the No. 200, %: nm

LL:	PL:	PI:	G_S:	Specimen Type:	Test Method:
nm	nm	nm	2.65 Assumed	Undisturbed	ASTM D2850

Membrane correction applied

Boring:	R-20-002
Sample:	S22
Depth, ft:	85.5
Test Date:	3/16/20

Remarks: nm= not measured, na = not applicable

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Project No.:	20180876.001A
Date:	3/20/20
Entry By:	CP
Checked By:	CP
File Name:	HL12966

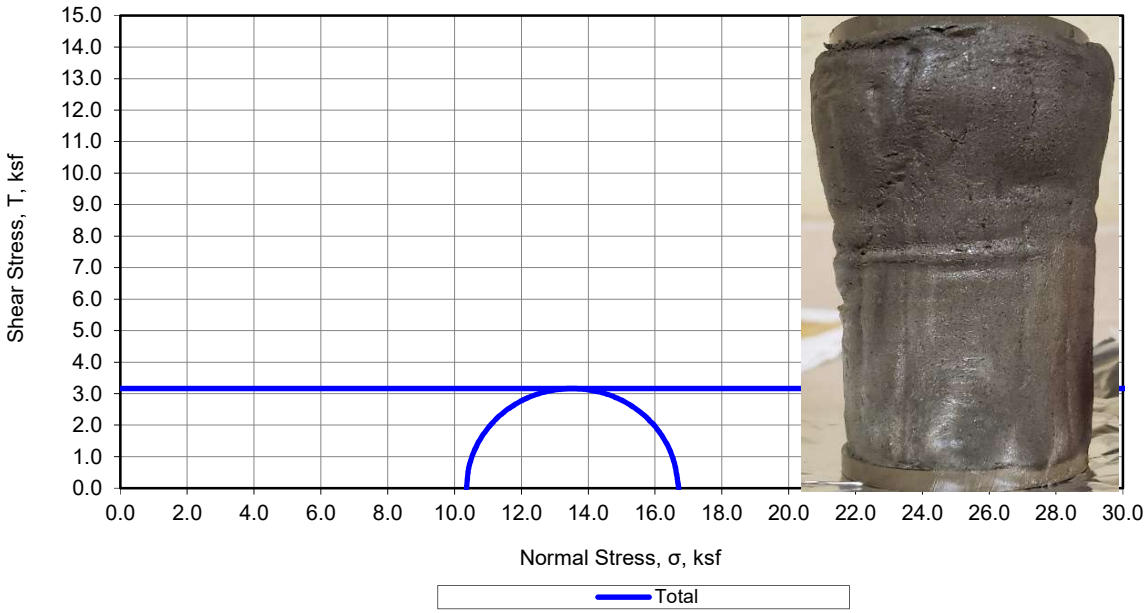
TRIAXIAL COMPRESSION TEST (UU)

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

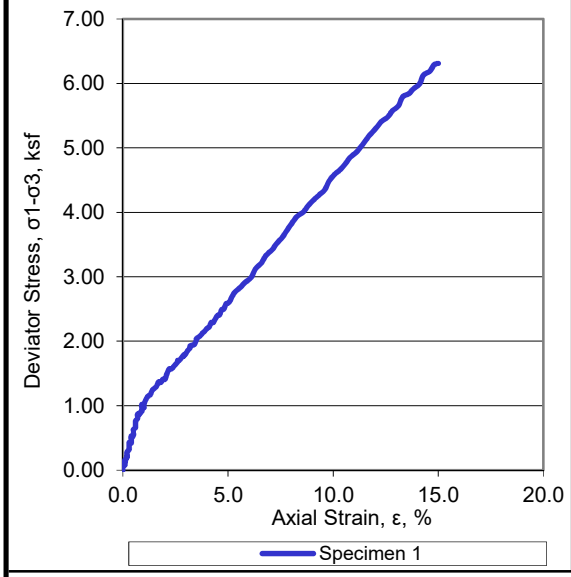
Figure

C-28

Total	
c = 3.16	ksf



Specimen Shear Picture



Specimen No.			1
Initial	Diameter, in	D_O	2.38
	Height, in	H_O	4.79
	Water Content, %	ω_O	24.1
	Dry Density, lbs/ft^3	$^{\gamma}d_o$	104.6
	Saturation, %	S_O	110
	Void Ratio	e_O	0.581
Minor Principal Stress, ksf		σ_3	10.37
Maximum Deviator Stress, ksf		$(\sigma 1-\sigma 3)_{max}$	6.31
Time to $(\sigma_1-\sigma_3)_{max}$, min		t_f	15.02
Deviator Stress @ 15% Axial Strain, ksf		$(\sigma_1-\sigma_3)_{15\%}$	6.31
Ultimate Deviator Stress, ksf		$(\sigma_1-\sigma_3)_{ult}$	na
Rate of strain, %/min		$'\varepsilon$	1.00
Axial Strain at Failure, %		ε_f	15.02

Description of Specimen: Black Slity Clay with Sand (CL-ML)

Amount of Material Finer than the No. 200, %: nm

LL:	PL:	PI:	G_S:	Specimen Type:	Test Method:
26	19	7	2.65 Assumed	Undisturbed	ASTM D2850

Membrane correction applied

Boring:	R-20-002
Sample:	S38
Depth, ft:	180.5
Test Date:	3/16/20

Remarks: nm= not measured, na = not applicable

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Project No.:	20180876.001A
Date:	3/20/20
Entry By:	CP
Checked By:	CP
File Name:	HL12966

TRIAXIAL COMPRESSION TEST (UU)

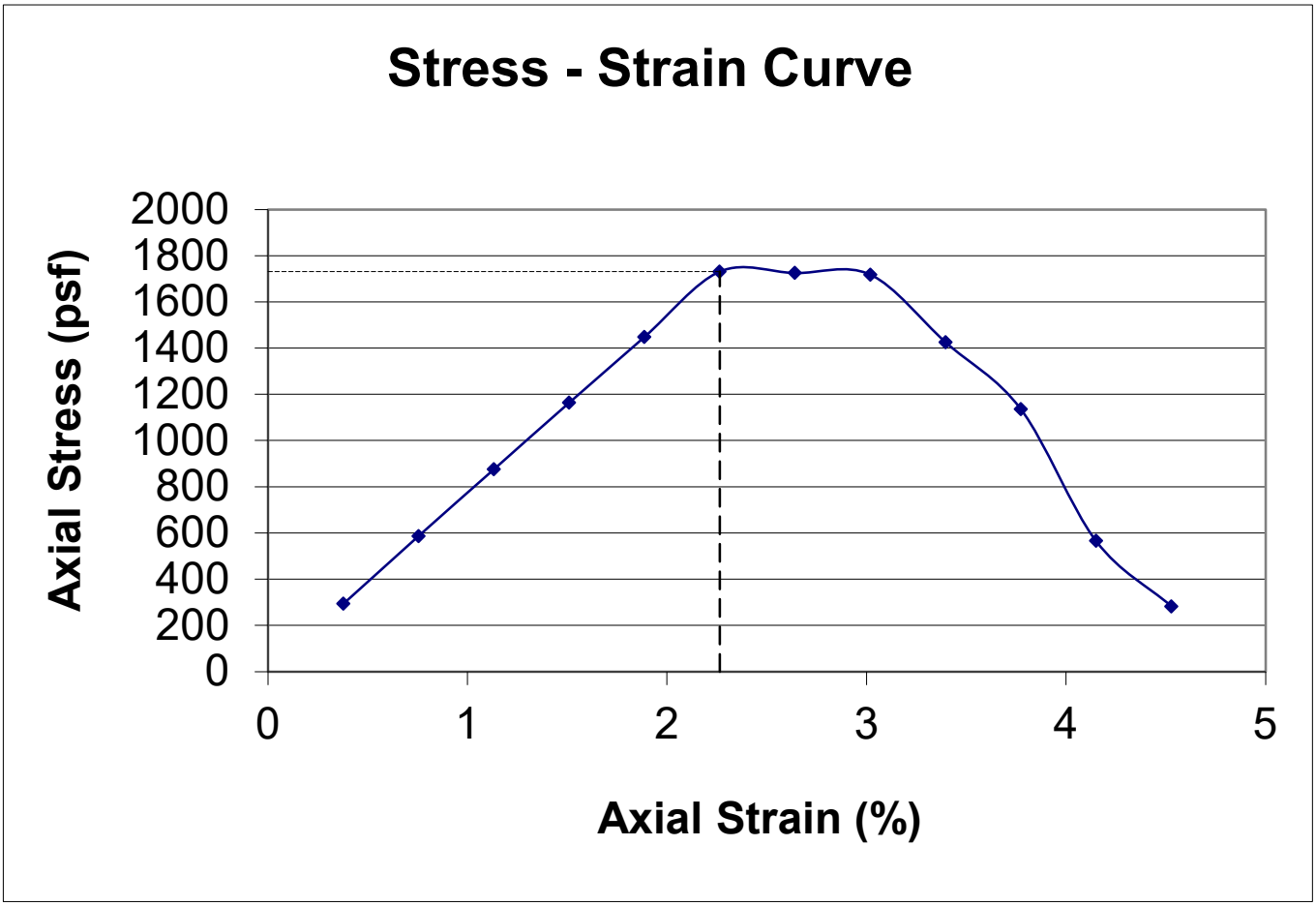
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

Figure

C-29

Sample Information			
Boring No.	R-20-002	Sample No.	24
Depth	95-96 ft		
Description	Dark gray silty sand		

Unit Weight	Diameter	2.42	in
	Length	5.3	in
	Wet Wt.	774.6	g
Moisture Content	Wet Wt.	410.9	
	Dry Wt.	320.8	
	Moisture	28.1%	
Wet Unit Weight	(pcf)	121.0	
Dry Unit Weight	(pcf)	94.5	



Unconfined Compressive Strength (psf) = **1731**

Unconfined Shear Strength (psf) = **865**

Loading Rate : 1%/min

Date Tested 3/25/2020

Performed in General Accordance with ASTM D2166

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Bright People. Right Solutions.

CHECKED BY :	J.B.	TECH:	Uly P.
PROJECT NO:	20180876.001A	DATE:	2-Apr-20

UNCONFINED COMPRESSION TEST

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

FIGURE

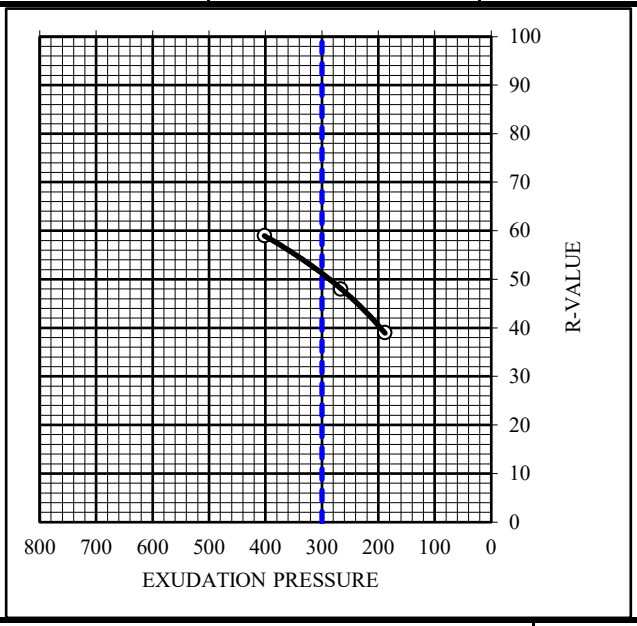
C-30

Boring No.	Sample No.	Depth	Description	Date Tested
R-20-001	S-1	0.5'-5'	Brown sand with silt	3/19/2020

TEST SPECIMEN				
MOLD NO.	6	2	9	
FOOT PRESSURE, psi	**280**	**210**	**150**	
INITIAL MOISTURE, %	4.0	4.0	4.0	
"AS-IS" WEIGHT, g	1200	1200	1200	
DRY WEIGHT, g	1154.4	1154.4	1154.4	
WATER ADDED, ml	**120**	**130**	**140**	
COMPACTION MOISTURE, %	14.3	15.2	16.1	
HEIGHT OF BRIQUETTE, in.	**2.5**	**2.49**	**2.48**	
WEIGHT BRIQUETTE/MOLD,	**3088**	**3089.3**	**3088.8**	
WEIGHT OF MOLD, g	**2101.2**	**2107.9**	**2114.6**	
WEIGHT OF BRIQUETTE, g	986.8	981.4	974.2	
DRY DENSITY, pcf	104.7	103.8	102.6	
STABILOMETER, 1000 lbs	**19**	**25**	**38**	
2000lbs	**40**	**55**	**68**	
DISPLACEMENT, in	**5.22**	**5.26**	**5.35**	
EXUDATION LOAD, lbs	**5048**	**3346**	**2368**	
EXUDATION PRESSURE, psi	401.9	266.4	188.5	
R-VALUE	59	48	39	
CORRECTED R-VALUE	59	48	39	
DIAL READING, END	0.0426	0.0275	0.0275	
DIAL READING, START	0.0433	0.0280	0.0286	
DIFFERENCE	-0.0007	-0.0005	-0.0011	
EXPANSION PRESSURE, PS	0.0	0.0	0.0	

INITIAL MOISTURE	
WET WEIGHT, g	323.4
DRY WEIGHT, g	311.1
WEIGHT OF WATER	
WEIGHT OF SAMPLE	
MOISTURE CONTENT %	4.0

R-VALUE:	**51**
Location:	



Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

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R-Value (ASTM D2844)

FIGURE

C-31

Checked By: J.B.	TECH: Uly P.
Job Number: 20180876.001A	DATE: 2-Apr-20

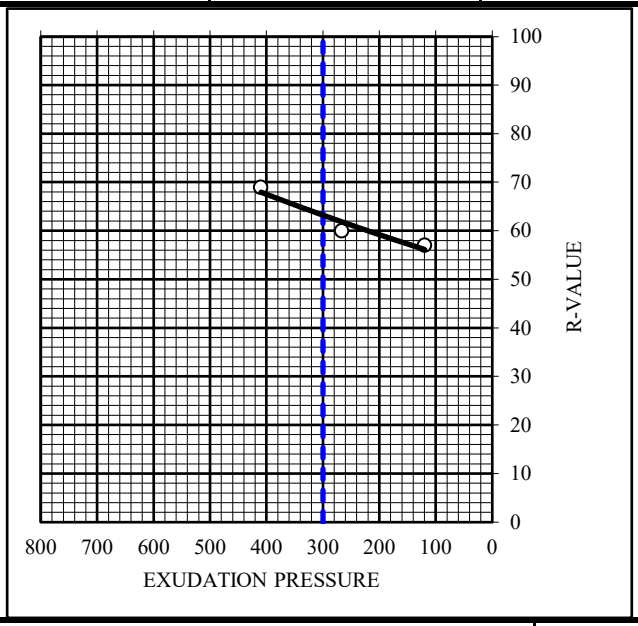
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

Boring No.	Sample No.	Depth	Description	Date Tested
R-20-002	S-1	0.5'-4'	Brown sand with silt	3/19/2020

TEST SPECIMEN				
MOLD NO.	10	5	8	
FOOT PRESSURE, psi	**250**	**210**	**150**	
INITIAL MOISTURE, %	4.3	4.3	4.3	
"AS-IS" WEIGHT, g	1200	1200	1200	
DRY WEIGHT, g	1150.3	1150.3	1150.3	
WATER ADDED, ml	**100**	**130**	**140**	
COMPACTION MOISTURE, %	13.0	15.6	16.5	
HEIGHT OF BRIQUETTE, in.	**2.55**	**2.56**	**2.56**	
WEIGHT BRIQUETTE/MOLD,	**3106.1**	**3112.7**	**3106.4**	
WEIGHT OF MOLD, g	**2109.2**	**2107.9**	**2112.7**	
WEIGHT OF BRIQUETTE, g	996.9	1004.8	993.7	
DRY DENSITY, pcf	104.9	103.0	101.1	
STABILOMETER, 1000 lbs	**14**	**19**	**19**	
2000lbs	**29**	**38**	**43**	
DISPLACEMENT, in	**5.03**	**5.44**	**5.07**	
EXUDATION LOAD, lbs	**5151**	**3346**	**1507**	
EXUDATION PRESSURE, psi	410.1	266.4	120.0	
R-VALUE	69	60	57	
CORRECTED R-VALUE	69	60	57	
DIAL READING, END	0.0295	0.0122	0.0300	
DIAL READING, START	0.0314	0.0126	0.0309	
DIFFERENCE	-0.0019	-0.0004	-0.0009	
EXPANSION PRESSURE, PS	0.0	0.0	0.0	

INITIAL MOISTURE	
WET WEIGHT, g	564.9
DRY WEIGHT, g	541.5
WEIGHT OF WATER	
WEIGHT OF SAMPLE	
MOISTURE CONTENT %	4.3

R-VALUE:	**63**
Location:	



Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

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Checked By: J.B.	TECH: Uly P.
Job Number: 20180876.001A	DATE: 2-Apr-20

R-Value (ASTM D2844)

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-32

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: March 17, 2020
Purchase Order Number: 20180876.001A
Sales Order Number: 47383
Account Number: KLE
To:
--
Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO7724-1 Customers Phone: 619-831-4600
Fax: 619-831-4619
Sample Designation:
--
One soil sample received on 03/11/20 at 10:45am, marked as
Project: Camino Del Mar Bridge Replacement
Project #: 20180876.001A
Boring #: R-20-001
Sample #: S1
Depth 0.5'-5.5'
Sampled by S. Tena
Date Sampled 02/20/2020

Analysis By California Test 643, 1999, Department of Transportation Division of Construction, Method for Estimating the Service Life of Steel Culverts.

pH 9.0

Water Added (ml)	Resistivity (ohm-cm)
10	42000
5	32000
5	24000
5	18000
5	16000
5	14000
5	12000
5	14000
5	17000

85 years to perforation for a 16 gauge metal culvert.
110 years to perforation for a 14 gauge metal culvert.
152 years to perforation for a 12 gauge metal culvert.
195 years to perforation for a 10 gauge metal culvert.
237 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.004% (42 ppm)

Water Soluble Chloride Calif. Test 422 0.002% (21 ppm)

Laura Torres
LT/dbb

KLEINFELDER
Bright People. Right Solutions.

Corrosion Testing

FIGURE

C-33

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

CHECKED BY: J.B. TECH: Clarkson Lab
JOB NUMBER: 20180876.001A DATE: 2-Apr-20

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: March 17, 2020
Purchase Order Number: 20180876.001A
Sales Order Number: 47383
Account Number: KLE
To:
--
Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO7724-2 Customers Phone: 619-831-4600
Fax: 619-831-4619
Sample Designation:
--
One soil sample received on 03/11/20 at 10:45am,
marked as
Project: Camino Del Mar Bridge Replacement
Project #: 20180876.001A
Boring #: R-20-002
Sample #: S1
Depth 0.5'-4'
Sampled by S. Tena
Date Sampled 02/20/2020

Analysis By California Test 643, 1999, Department of Transportation
Division of Construction, Method for Estimating the Service Life of
Steel Culverts.

pH 8.7

Water Added (ml)	Resistivity (ohm-cm)
10	31000
5	23000
5	18000
5	13000
5	19000
5	23000

87 years to perforation for a 16 gauge metal culvert.
114 years to perforation for a 14 gauge metal culvert.
157 years to perforation for a 12 gauge metal culvert.
201 years to perforation for a 10 gauge metal culvert.
245 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.005% (45 ppm)

Water Soluble Chloride Calif. Test 422 0.002% (21 ppm)

Laura Torres

Laura Torres
LT/dbb

KLEINFELDER
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Corrosion Testing

FIGURE

C-34

CHECKED BY: J.B. TECH: Clarkson Lab
JOB NUMBER: 20180876.001A DATE: 2-Apr-20

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: March 25, 2020
Purchase Order Number: 20180876.001A
Sales Order Number: 47494
Account Number: KLE

To:
--
Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO7733-1 Customers Phone: 619-831-4600
Fax: 619-831-4619

Sample Designation:
--
One soil sample received on 03/20/20 at 9:20am,
marked as:
Project: Camino Del Mar Bridge Replacement
Project #: 20180876.001A
Boring #: R-20-001
Sample #: S13
Depth: 51'-51.5'
Sampled by S. Tena
Date Sampled 02/20/20

Analysis By California Test 643, 1999, Department of Transportation Division of Construction, Method for Estimating the Service Life of Steel Culverts.

pH 9.0

Water Added (ml)	Resistivity (ohm-cm)
15	590
5	400
5	290
5	220
5	200
5	190
5	190
5	200
5	210

15 years to perforation for a 16 gauge metal culvert.
20 years to perforation for a 14 gauge metal culvert.
28 years to perforation for a 12 gauge metal culvert.
36 years to perforation for a 10 gauge metal culvert.
43 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.060% (600ppm)

Water Soluble Chloride Calif. Test 422 0.246% (2460ppm)

Rosa Bernal
RMB/ilv

KLEINFELDER
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Corrosion Testing

FIGURE

C-35

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

CHECKED BY: J.B. TECH: Clarkson Lab
JOB NUMBER: 20180876.001A DATE: 13-May-20

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: March 25, 2020
Purchase Order Number: 20180876.001A
Sales Order Number: 47494
Account Number: KLE

To:
--
Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO7733-2 Customers Phone: 619-831-4600
Fax: 619-831-4619
Sample Designation:
--
One soil sample received on 03/20/20 at 9:20am,
marked as:
Project: Camino Del Mar Bridge Replacement
Project #: 20180876.001A
Boring #: R-20-002
Sample #: S30
Depth: 126'-126.5'
Sampled by S. Tena
Date Sampled 02/20/20

Analysis By California Test 643, 1999, Department of Transportation
Division of Construction, Method for Estimating the Service Life of
Steel Culverts.

pH 8.0

Water Added (ml)	Resistivity (ohm-cm)
20	220
5	200
5	150
5	110
5	100
5	93
5	85
5	120
5	140

11 years to perforation for a 16 gauge metal culvert.
14 years to perforation for a 14 gauge metal culvert.
20 years to perforation for a 12 gauge metal culvert.
26 years to perforation for a 10 gauge metal culvert.
31 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.087% (870ppm)

Water Soluble Chloride Calif. Test 422 0.748% (7480ppm)

Rosa Bernal
RMB/ilv

KLEINFELDER
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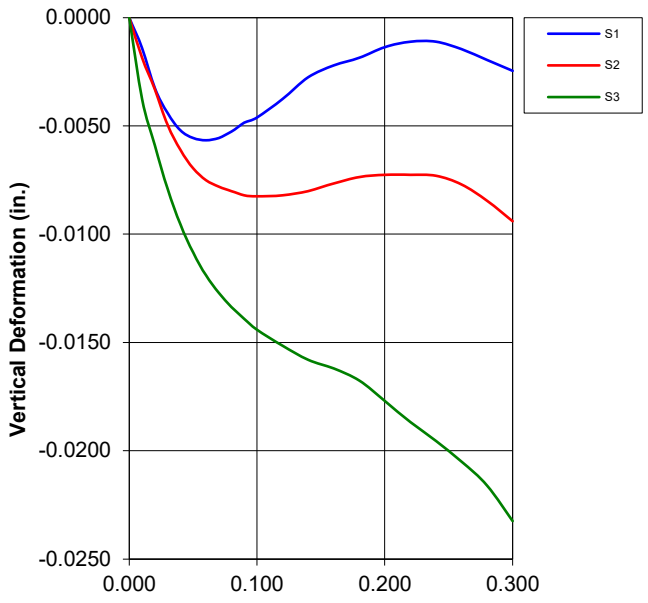
Corrosion Testing

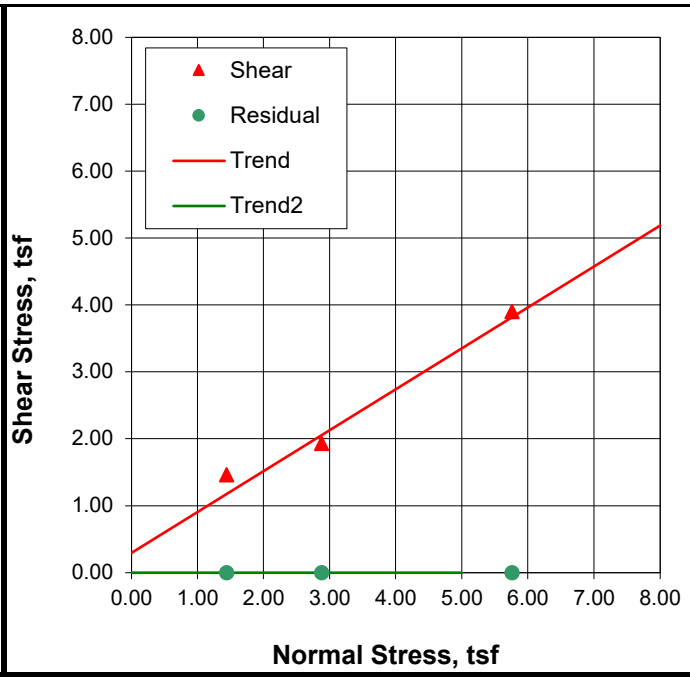
FIGURE

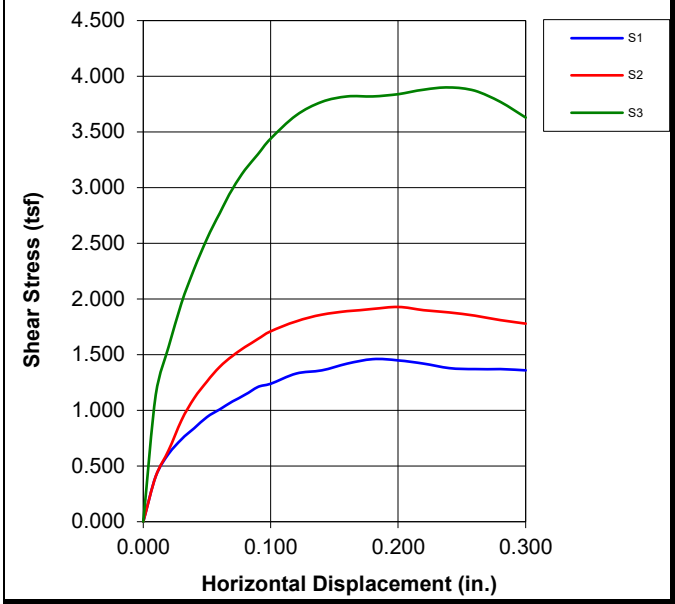
C-36

Camino Del Mar Bridge Replacement
Over San Dieguito River - Phase 0
Del Mar, California

CHECKED BY: J.B. TECH: Clarkson Lab
JOB NUMBER: 20180876.001A DATE: 13-May-20







Specimen Number		1	2	3	
Initial	Water Content, %	35.0	34.1	33.5	
	Dry Density, pcf	86.0	87.0	86.8	
	Void Ratio	0.960	0.936	0.941	
	Saturation, %	98.4	98.4	96.2	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
At Test	Water Content, %	41.6	41.2	41.1	
	Dry Density, pcf	91.2	92.3	97.3	
	Void Ratio	0.851	0.840	0.771	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.91	0.91	0.88	
Maximum Shear Stress, tsf		1.46	1.93	3.90	
Residual Shear Stress, tsf		na	na	na	
Hoizontal Displacment, in.		0.180	0.200	0.240	
Normal Stress, tsf		1.44	2.88	5.76	
Strain Rate, in./min.		0.001	0.001	0.001	

LL:	nm	PL:	nm	PI:	nm	G_S:	2.70	Assumed

	c, tsf	ϕ, deg.	Tan ϕ
Failure	0.3	31.4	0.61
Residual	na	na	na

Test Conditions: Undisturbed / Inundated

Specimen 1: Greenish Black Silt

Specimen 2: Greenish Black Silt

Specimen 3: Greenish Black Silt

Boring:	R-20-001
Sample:	S23
Depth, ft:	101.0-101.5
Test Date:	3/18/2020

Remarks: nm = not measured, na = not applicable

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. The user of this report retains the sole responsibility to evaluate and approve any interpreted values from the testing.

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9969 Horn Rd., Sacramento, CA 95827

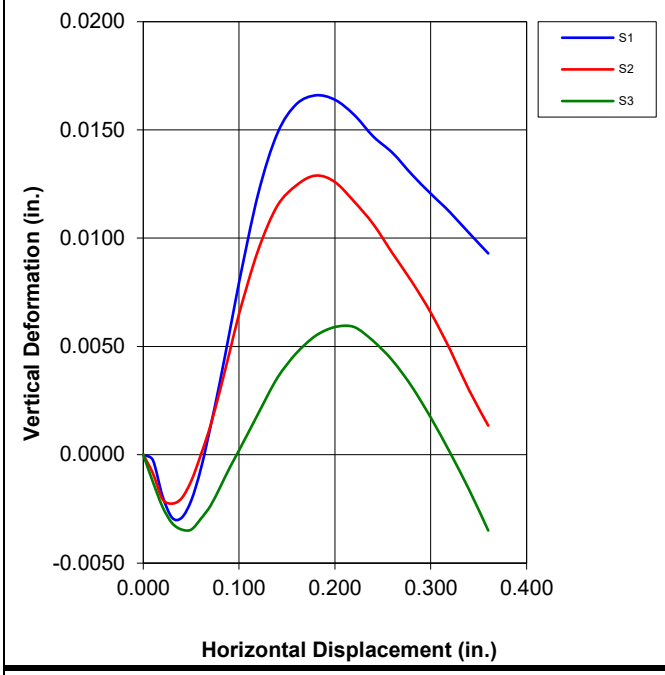
PROJECT NO.:	20180876
ENTRY BY:	A. Wohletz
CHECKED BY:	S. Rader
DATE:	3/23/2020

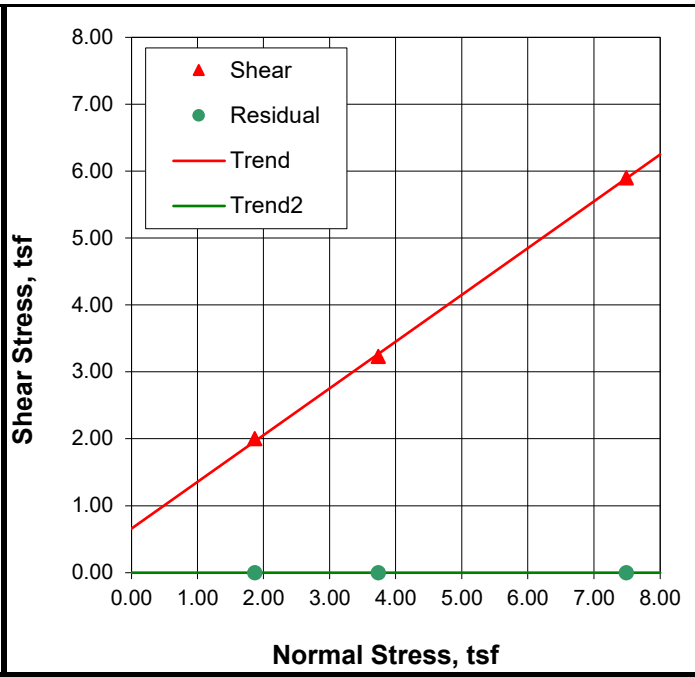
DIRECT SHEAR TEST ASTM D3080

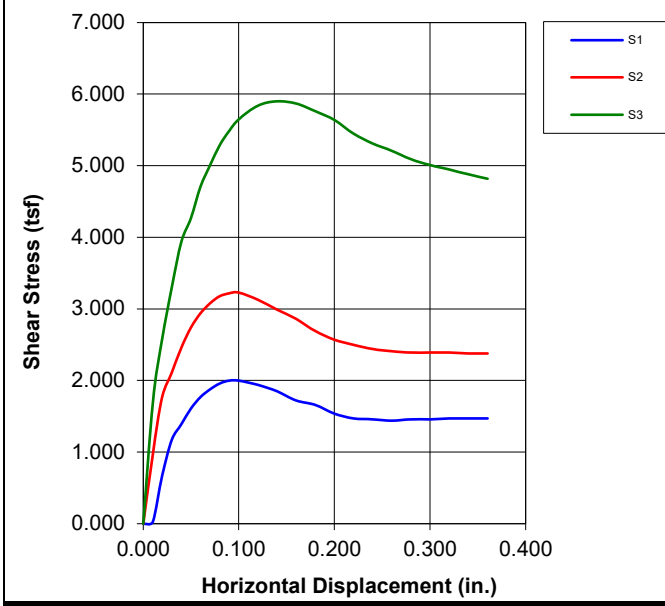
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-37







Specimen Number		1	2	3	
Initial	Water Content, %	20.6	21.5	21.0	
	Dry Density, pcf	103.5	102.7	103.4	
	Void Ratio	0.628	0.640	0.629	
	Saturation, %	88.7	90.9	90.0	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
At Test	Water Content, %	22.7	23.9	23.1	
	Dry Density, pcf	105.4	105.3	107.4	
	Void Ratio	0.588	0.588	0.563	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.94	0.93	0.92	
Maximum Shear Stress, tsf		2.00	3.23	5.90	
Residual Shear Stress, tsf		na	na	na	
Hoizontal Displacment, in.		0.090	0.100	0.140	
Normal Stress, tsf		1.87	3.74	7.49	
Strain Rate, in./min.		0.005	0.005	0.005	

LL:	nm	PL:	nm	PI:	nm	G_S:	2.70	Assumed

	c, tsf	ϕ, deg.	Tan ϕ
Failure	0.7	34.9	0.70
Residual	na	na	na

Test Conditions: Undisturbed / Inundated

Specimen 1: Bluish Gray Poorly Graded Sand

Specimen 2: Bluish Gray Poorly Graded Sand

Specimen 3: Bluish Gray Poorly Graded Sand

Boring:	R-20-001
Sample:	S29
Depth, ft:	131.0-131.5
Test Date:	3/20/2020

Remarks: nm = not measured, na = not applicable

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. The user of this report retains the sole responsibility to evaluate and approve any interpreted values from the testing.

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9969 Horn Rd., Sacramento, CA 95827

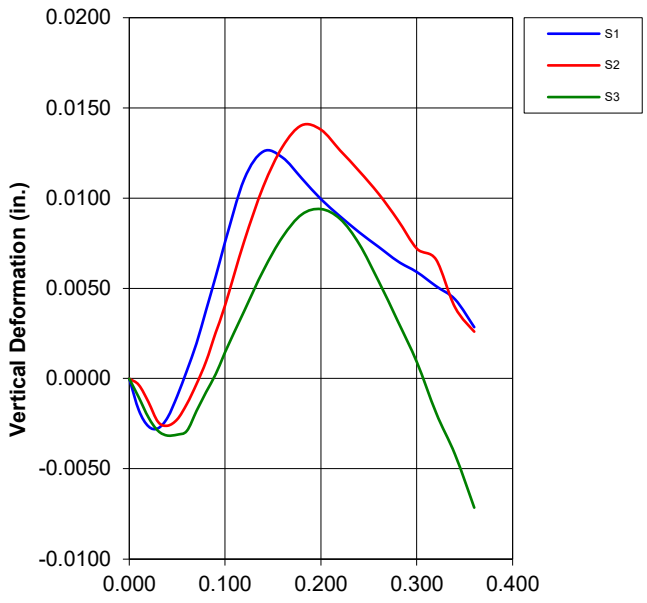
PROJECT NO.:	20180876
ENTRY BY:	A. Wohletz
CHECKED BY:	S. Rader
DATE:	3/23/2020

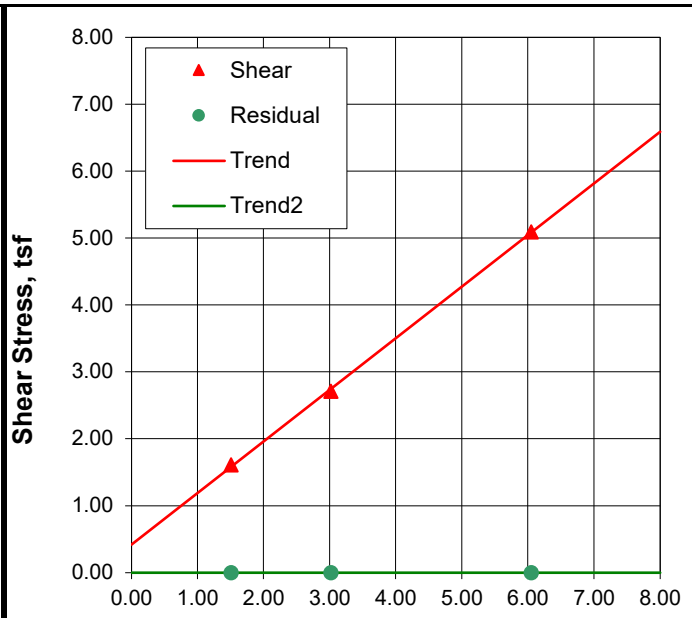
DIRECT SHEAR TEST ASTM D3080

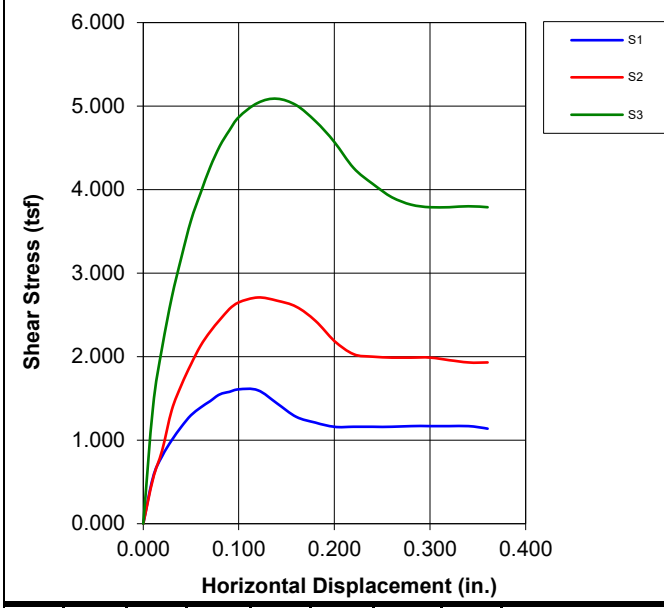
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-38







Specimen Number		1	2	3	
Initial	Water Content, %	25.6	26.2	25.3	
	Dry Density, pcf	99.6	100.3	101.1	
	Void Ratio	0.660	0.649	0.636	
	Saturation, %	102.8	107.1	105.4	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
At Test	Water Content, %	27.9	25.8	27.3	
	Dry Density, pcf	101.4	103.2	106.4	
	Void Ratio	0.617	0.589	0.544	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.94	0.93	0.91	
Maximum Shear Stress, tsf		1.61	2.71	5.09	
Residual Shear Stress, tsf		na	na	na	
Hoizontal Displacment, in.		0.100	0.120	0.140	
Normal Stress, tsf		1.51	3.02	6.05	
Strain Rate, in./min.		0.005	0.005	0.005	

LL:	NM	PL:	NM	PI:	NM	G_S:	2.65	Assumed

	c, tsf	ϕ, deg.	Tan ϕ
Failure	0.4	37.6	0.77
Residual	na	na	na

Test Conditions: Undisturbed / Inundated

Specimen 1: Gray Poorly Graded Sand

Specimen 2: Gray Poorly Graded Sand

Specimen 3: Gray Poorly Graded Sand

Boring:	R-20-002
Sample:	S26
Depth, ft:	106.0-106.5
Test Date:	3/24/2020

Remarks: nm = not measured, na = not applicable

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. The user of this report retains the sole responsibility to evaluate and approve any interpreted values from the testing.

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9969 Horn Rd., Sacramento, CA 95827

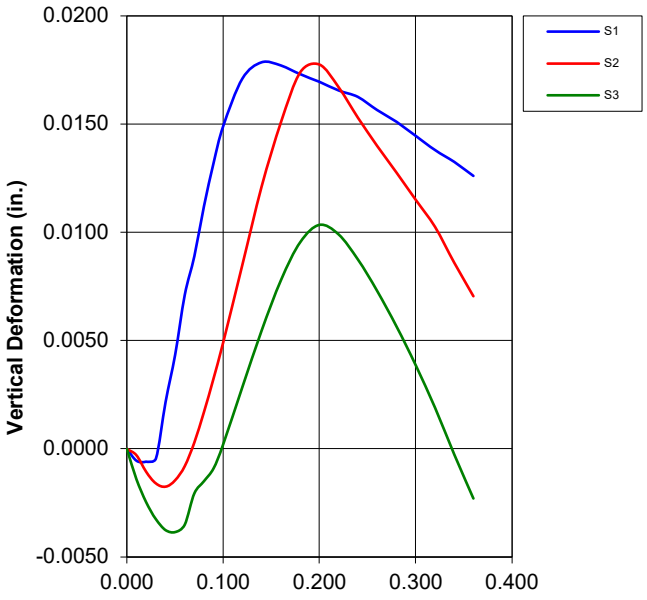
PROJECT NO.:	20180876
ENTRY BY:	A. Wohletz
CHECKED BY:	S. Rader
DATE:	3/25/2020

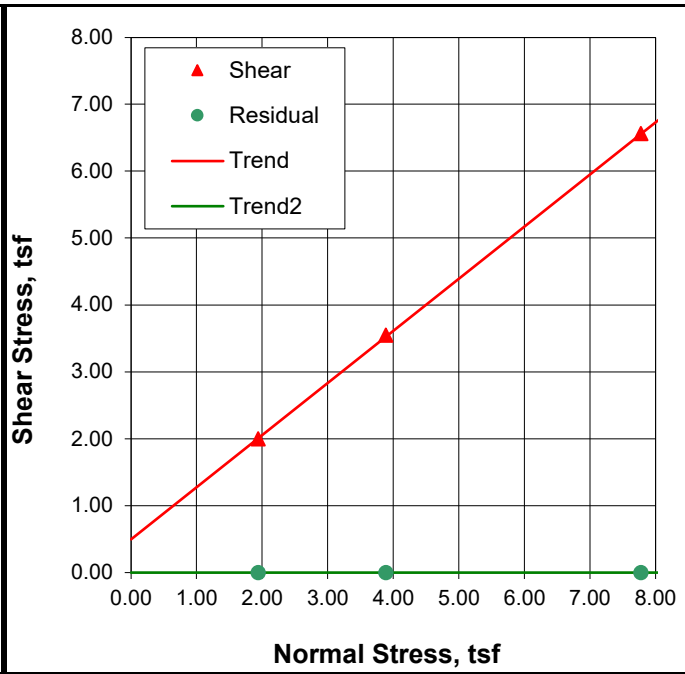
DIRECT SHEAR TEST ASTM D3080

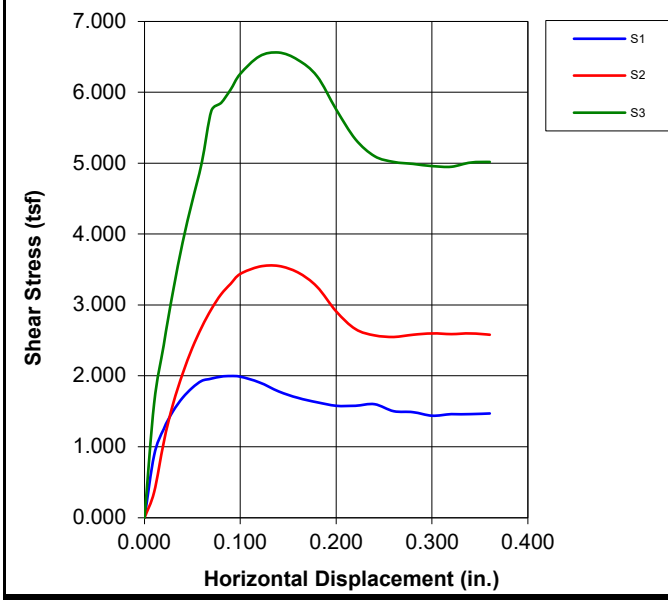
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-39







	Specimen Number	1	2	3	
Initial	Water Content, %	17.5	17.8	17.3	
	Dry Density, pcf	111.2	112.4	113.7	
	Void Ratio	0.487	0.471	0.454	
	Saturation, %	95.2	99.9	100.7	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
At Test	Water Content, %	20.5	20.9	19.2	
	Dry Density, pcf	109.7	111.0	113.1	
	Void Ratio	0.487	0.471	0.454	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
	Maximum Shear Stress, tsf	2.00	3.55	6.56	
	Residual Shear Stress, tsf	na	na	na	
	Hoizontal Displacment, in.	0.090	0.140	0.140	
	Normal Stress, tsf	1.94	3.89	7.78	
	Strain Rate, in./min.	0.005	0.005	0.005	

LL:	nm	PL:	nm	PI:	nm	G_S:	2.65	Assumed

	c, tsf	ϕ, deg.	Tan ϕ
Failure	0.5	37.9	0.78
Residual	na	na	na

Test Conditions: Undisturbed / Inundated

Specimen 1: Gray Poorly Graded Sand

Specimen 2: Gray Poorly Graded Sand

Specimen 3: Gray Poorly Graded Sand

Boring:	R-20-002
Sample:	S32
Depth, ft:	136-136.5
Test Date:	4/3/2020

Remarks: nm = not measured, na = not applicable

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. The user of this report retains the sole responsibility to evaluate and approve any interpreted values from the testing.

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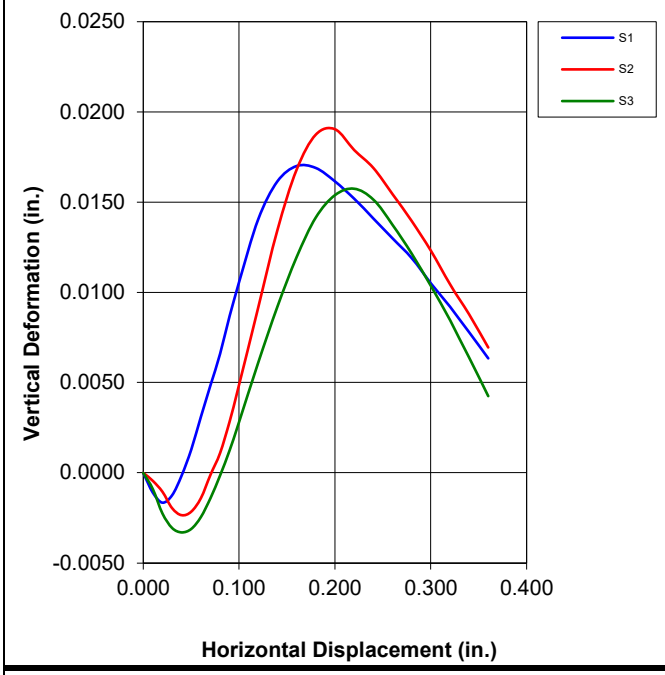
PROJECT NO.:	20180876
ENTRY BY:	A. Wohletz
CHECKED BY:	S. Rader
DATE:	4/6/2020

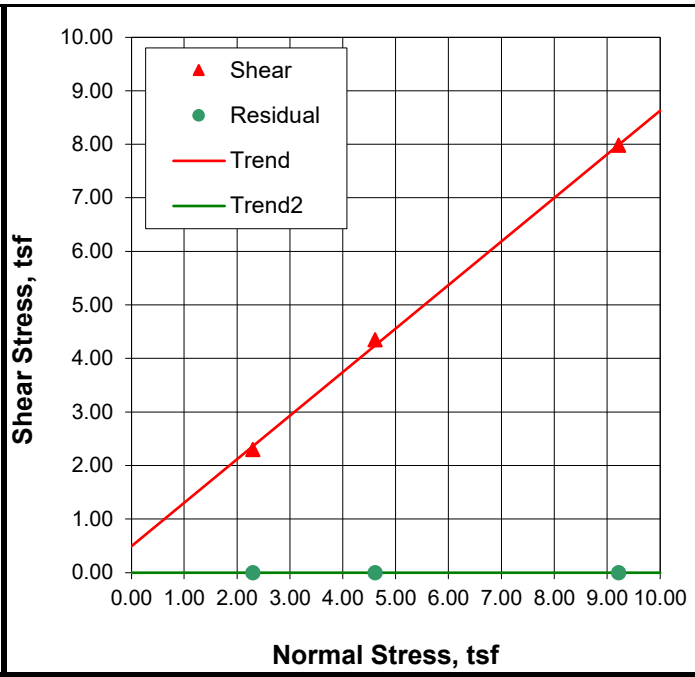
DIRECT SHEAR TEST ASTM D3080

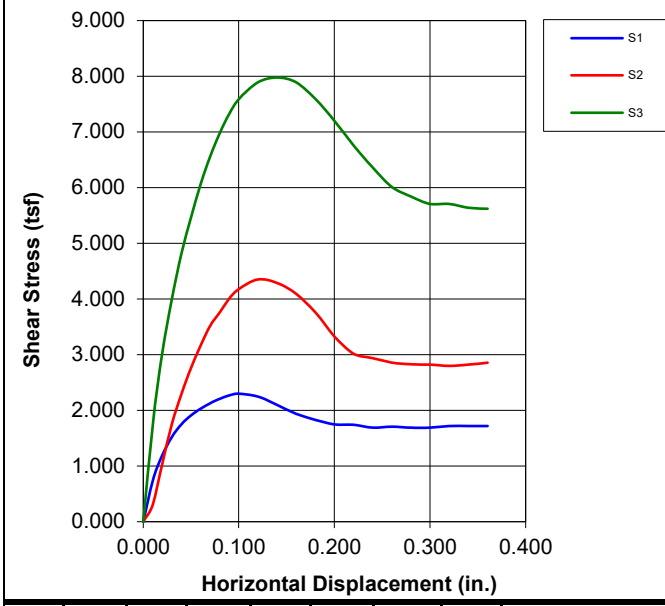
Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

FIGURE

C-40







Specimen Number		1	2	3	
Initial	Water Content, %	15.9	16.2	17.3	
	Dry Density, pcf	109.1	112.3	111.6	
	Void Ratio	0.516	0.473	0.482	
	Saturation, %	81.6	90.7	95.3	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.96	0.96	0.96	
At Test	Water Content, %	20.4	20.4	19.9	
	Dry Density, pcf	110.8	116.9	116.0	
	Void Ratio	0.476	0.401	0.411	
	Diameter, in	2.42	2.42	2.42	
	Height, in	0.93	0.91	0.91	
Maximum Shear Stress, tsf		2.30	4.35	7.98	
Residual Shear Stress, tsf		na	na	na	
Hoizontal Displacment, in.		0.100	0.120	0.140	
Normal Stress, tsf		2.30	4.61	9.22	
Strain Rate, in./min.		0.005	0.005	0.005	

LL:	NM	PL:	NM	PI:	NM	G_S:	2.65	Assumed

	c, tsf	ϕ, deg.	Tan ϕ
Failure	0.5	39.1	0.81
Residual	na	na	na

Test Conditions: Undisturbed / Inundated

Specimen 1: Gray Poorly Graded Sand

Specimen 2: Gray Poorly Graded Sand

Specimen 3: Gray Poorly Graded Sand

Boring:	R-20-002
Sample:	S36
Depth, ft:	161
Test Date:	03/26/2020

Remarks: nm = not measured, na = not applicable

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9969 Horn Rd., Sacramento, CA 95827

PROJECT NO.:	20180876
ENTRY BY:	A. Wohletz
CHECKED BY:	S. Rader
DATE:	03/27/2020

DIRECT SHEAR TEST ASTM D3080

Camino Del Mar Bridge Replacement Over San Dieguito River - Phase 0 Del Mar, California

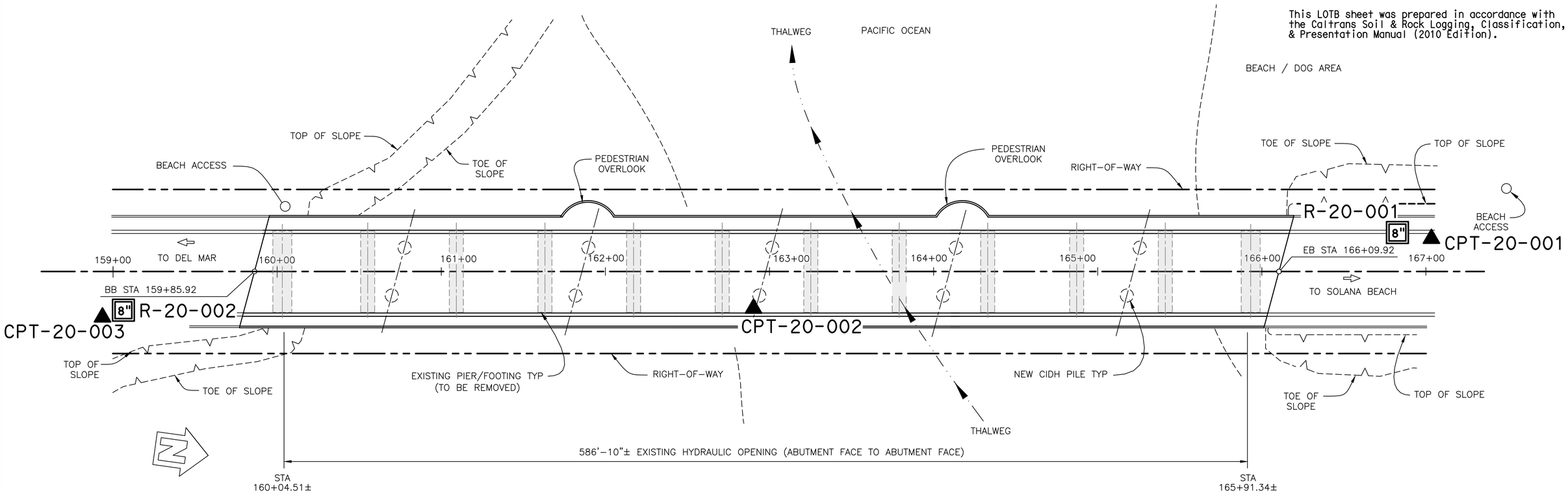
FIGURE

C-41

APPENDIX D
LOG OF TEST BORINGS (LOTBs)

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This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).



PLAN

SCALE: 1"=30'

HOLE ID	STATION AND OFFSET
CPT-20-003	158+93 / 27.79 Rt
R-20-002	159+06 / 23.60 Rt
CPT-20-002	162+90 / 22.51 Rt
R-20-001	166+83 / 23.70 Lt
CPT-20-001	167+03 / 20.16 Lt

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: D. Fahrney | DRAWN: D. Fahrney | CHECKED: J. Bonfiglio

ENGINEER OF WORK | R.C.E. NO. | DATE

KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA. 92101 (619) 831-4600

APPROVED

PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR

CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

SHEET 1 OF 8 SHEETS

ORIGINAL SCALE: 0 1" 1 2" 1 3" 1 4 INCHES

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE
"LOG OF TEST BORINGS" SHEET 1 OF 8

Station 166+83
Offset 23.7 Lt

R-20-001

8"

Elev. 16.00

			M PA R CR	ASPHALT CONCRETE; (5") POORLY GRADED SAND with SILT (SP-SM); yellowish red (5YR 5/6); moist; mostly medium to fine SAND; little fines; non-plastic (ARTIFICIAL FILL (af)).
26	1.4			- yellow (10YR 7/6) and dark yellowish brown (10YR 4/4); coarse to fine SAND
				- medium dense; strong brown (7.5YR 4/6); medium to fine SAND
21	1.4		M PA	POORLY GRADED SAND with SILT (SP-SM); medium dense; light brownish gray (2.5Y 6/1); moist; mostly fine SAND; little fines; non-plastic (RECENT ALLUVIAL DEPOSITS (Qa)).
19	1.4			
16	1.4		M PA PI	- gray (2.5Y 5/1); medium to fine SAND; increase in moisture content
25	1.4		M	- wet
17	1.4		M PA	POORLY GRADED SAND (SP); medium dense; gray (2.5Y 5/1); wet; medium to fine SAND; non-plastic; micaceous
12	1.4		M	POORLY GRADED SAND with SILT (SP-SM); medium dense; dark gray (2.5Y 4/1); wet; medium to fine SAND; little fines; non-plastic
6	1.4	4"	PA	- loose; few coarse subrounded GRAVEL, 2 in. max. dia.
13	1.4			SILTY SAND (SM); medium dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines
				LEAN CLAY (CL); very soft; dark gray (2.5Y 4/1); wet; few fine SAND; mostly fines; medium plasticity
7	2.4		M UW PI	-PP=0.0 tsf
				SILTY SAND (SM); loose; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; trace shell fragments
8	1.4		PA PI	FAT CLAY (CH); very soft; dark gray (2.5Y 4/1); wet; few medium SAND; mostly fines; medium to high plasticity; trace roots and shell fragments; PP=0.0 tsf
52	2.4			SILTY SAND with GRAVEL (SM); wet; (inferred from drilling action)
				- subrounded gravel (3") inside sampler
31	1.4			
40	2.4		M UW PA	SILTY SAND (SM); dense; dark gray (2.5Y 4/1); wet; mostly coarse to fine SAND; little fines; non-plastic; trace shell fragments (YOUNG ALLUVIAL DEPOSITS (Qya)).
41	1.4			SILTY SAND (SM); dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic
66	2.4		M UW PA PI	- very dense; micaceous
8	1.4			- loose; PP=0.0 tsf
				SANDY LEAN CLAY (CL); very soft; dark gray (2.5Y 4/1); wet; some fine SAND; mostly fines; low to medium plasticity
51	2.4		M UW PA	POORLY GRADED SAND with SILT (SP-SM); very dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; trace shell fragments
43	1.4		PI	- dense

GWS Elev 2
2-18-20

GWS Elev -1
2-21-20

MATCHLINE
(See "Log of Test Borings 3 of 8")

PROFILE
HOR. 1"=30'
VERT. 1"=5'

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

REVISION | DESCRIPTION | APPROVED | DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: D. Fahrney
DRAWN: D. Fahrney
CHECKED: J. Bonfiglio
ENGINEER OF WORK
R.C.E. NO. DATE

KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA 92101 (619) 831-4600

APPROVED
PUBLIC WORKS DIRECTOR
DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

SHEET 2 OF 8 SHEETS

ORIGINAL SCALE: 0 1 INCHES 2 3 4

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE
"LOG OF TEST BORINGS" SHEET 1 OF 8

-40 -40

-50 -50

MATCHLINE
(See "Log of Test Borings 2 of 8")

-60 -60

71 | 2.4 (M)(UW)(PA) —- very dense

-70 -70

21 | 1.4 SILTY SAND (SM); medium dense; dark gray (2.5Y 4/1); wet; mostly medium to fine SAND; little fines; non-plastic (YOUNG ESTUARINE DEPOSITS (Qyes)).

LEAN CLAY (CL); medium stiff; black (10YR 2/1); wet; few fine SAND; mostly fines; medium plasticity; micaceous, trace shell fragments; PP=0.5 tsf

12 | 2.4 (M)(UW)(PI)(WA)

-80 -80

20 | 1.4 SILTY SAND (SM); medium dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; some fines; non-plastic (OLD ALLUVIAL DEPOSITS (Qoa)).

35 | 2.4 (DS) —- dense

-90 -90

26 | 1.4 POORLY GRADED SAND with SILT (SP-SM); medium dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; little fines; non-plastic; micaceous

24 | 2.4 (M)(UW)(PA) —- SAA

-100 -100

33 | 1.4 SILTY SAND (SM); dense; dark gray (10YR 4/1); mostly medium to fine SAND; little fines; non-plastic

57 | 2.4 (M)(UW)(PA) —- very dense

-110 -110

55 | 1.4 —- SAA

53 | 2.4 (DS) —- SAA

-120 -120

36 | 1.4 —- dense

-130 -130

SILTY SAND (SM); dense; dark gray (10YR 4/1); mostly medium to fine SAND; little fines; non-plastic

CLAYSTONE; dark reddish brown (2.5YR 3/4) with grayish green (GLEY 1-5/5GY); medium plasticity (DEL MAR FORMATION (Td)).
-PP >=4.5 tsf

50/5 | 1.4 (PA)(PI)

02-21-20
Terminated at Elev -135.00
Hammer Energy Ratio (ERi) = 94%

-140 -140

-150 -150

-160 -160

-170 -170

-180 -180

-190 -190

PROFILE
HOR. 1"=30'
VERT. 1"=5'

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REVISION | DESCRIPTION | APPROVED | DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: D. Fahrney
DRAWN: D. Fahrney
CHECKED: J. Bonfiglio
ENGINEER OF WORK
R.C.E. NO. DATE

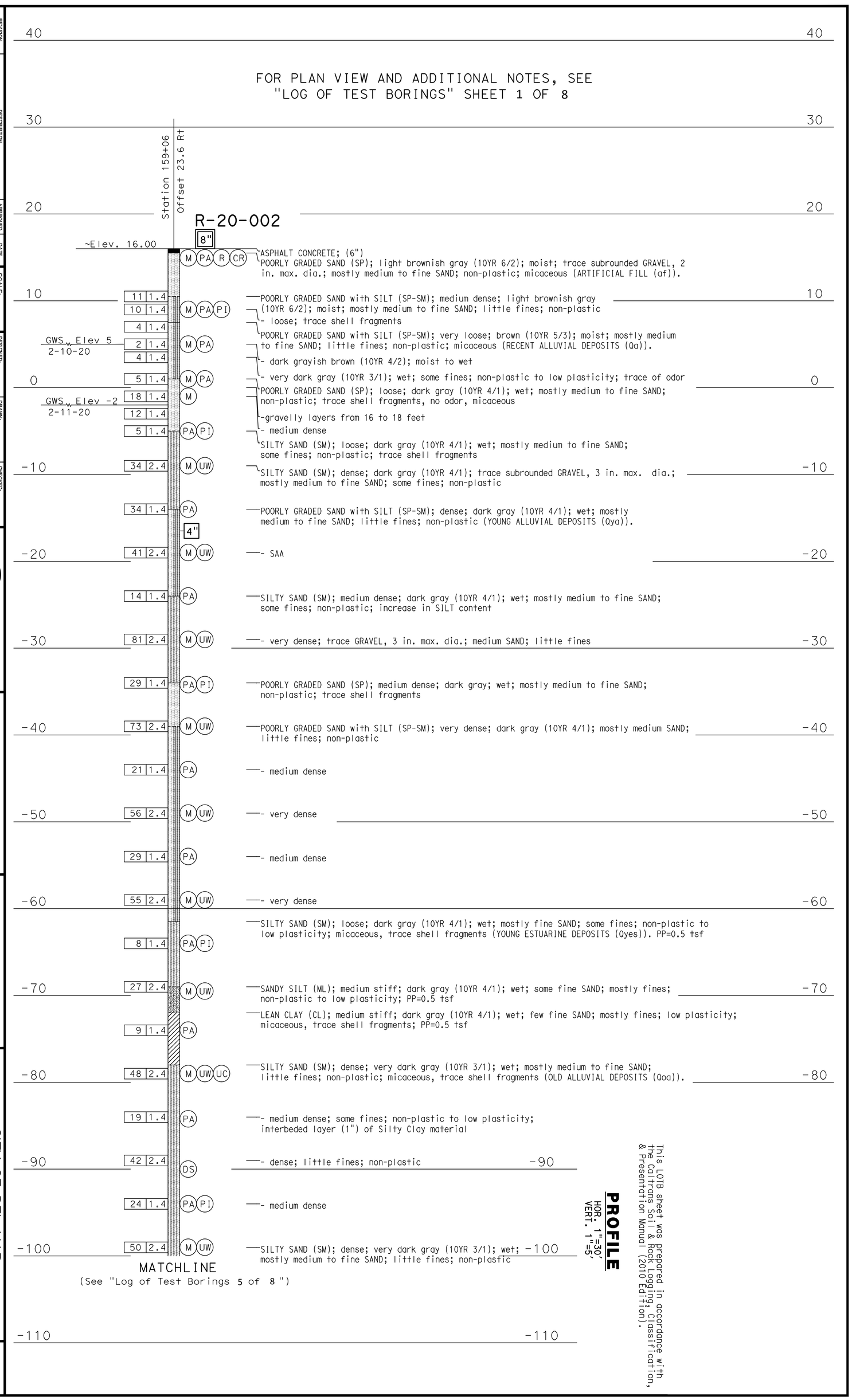
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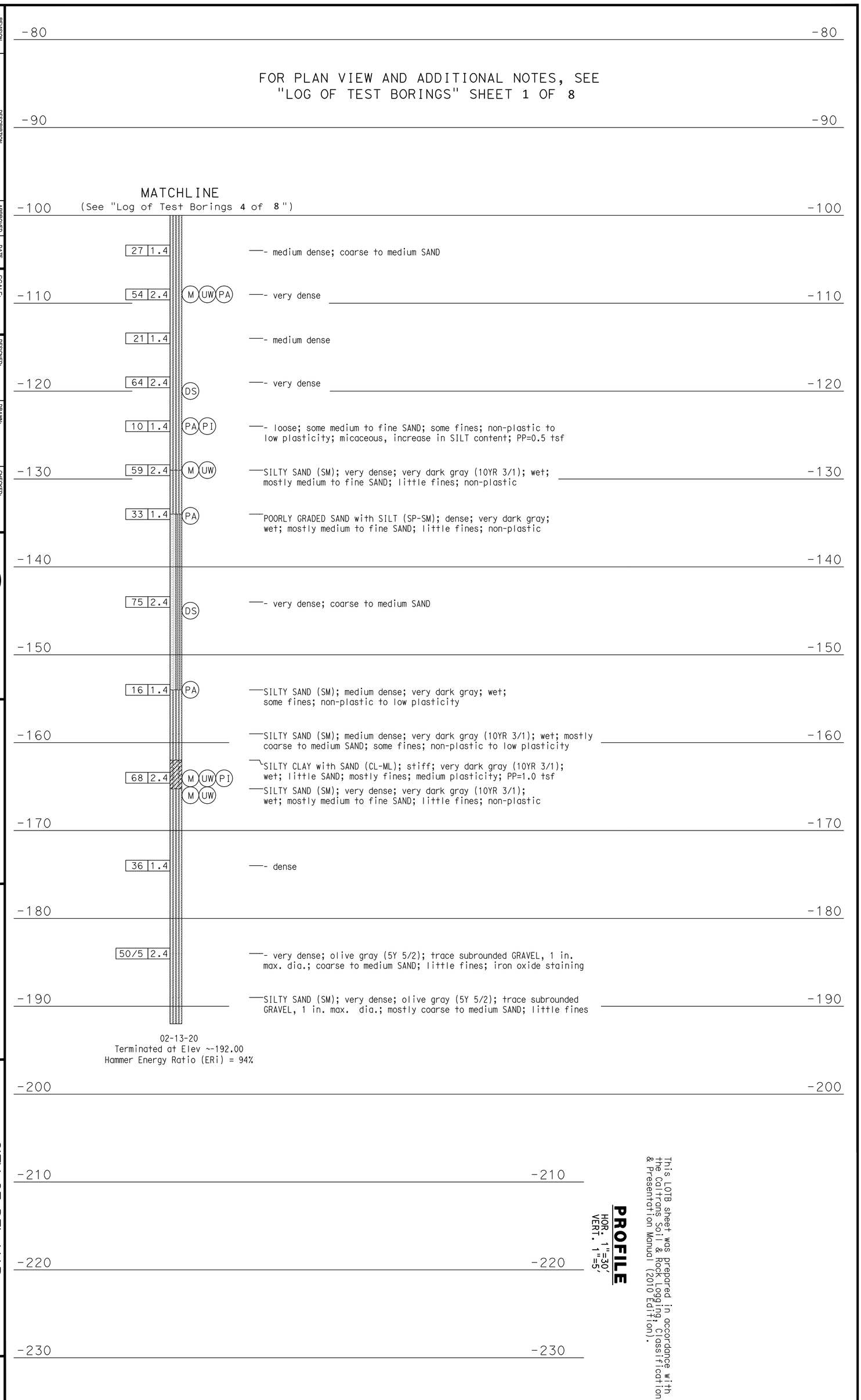
APPROVED
PUBLIC WORKS DIRECTOR
DATE

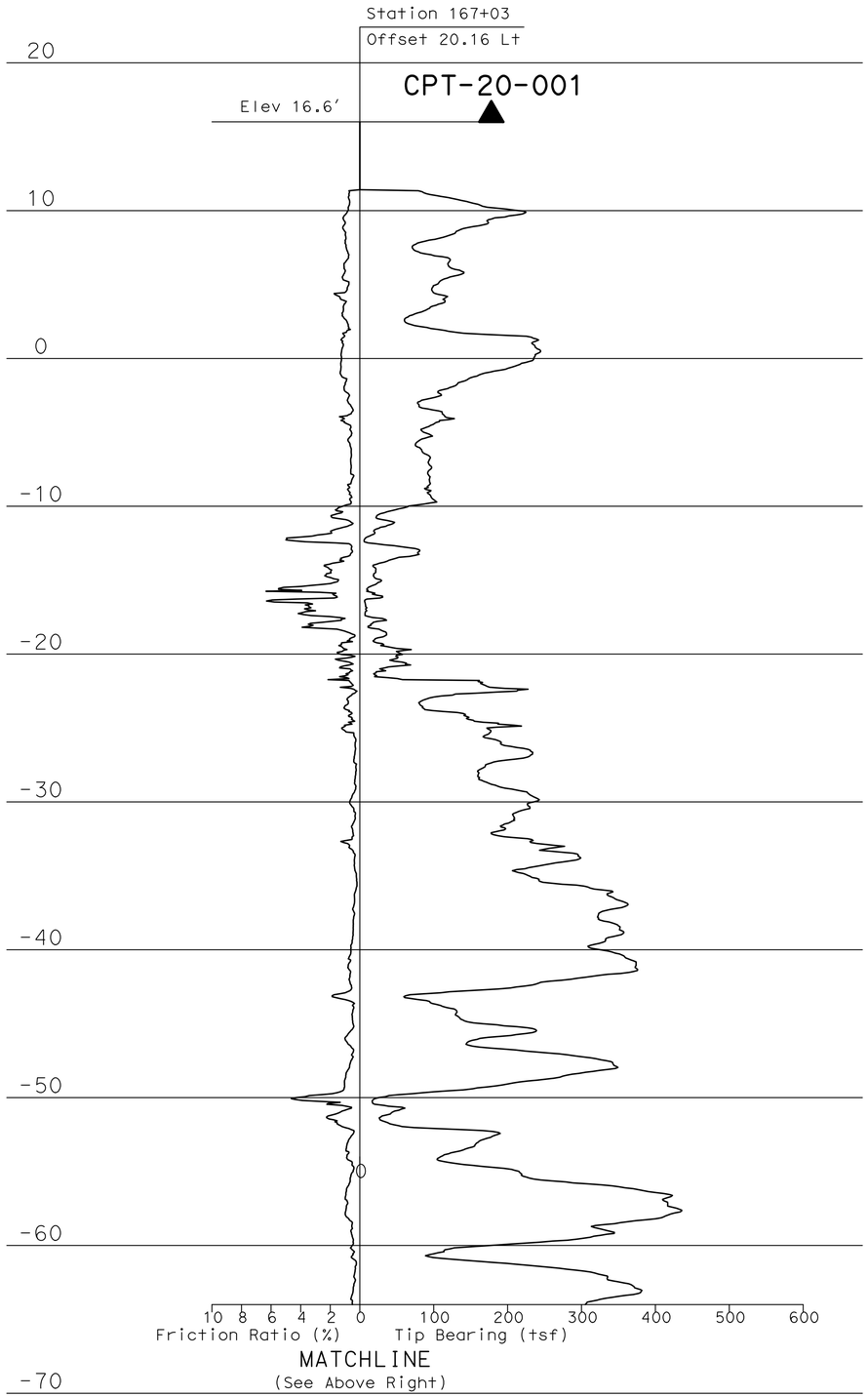
CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

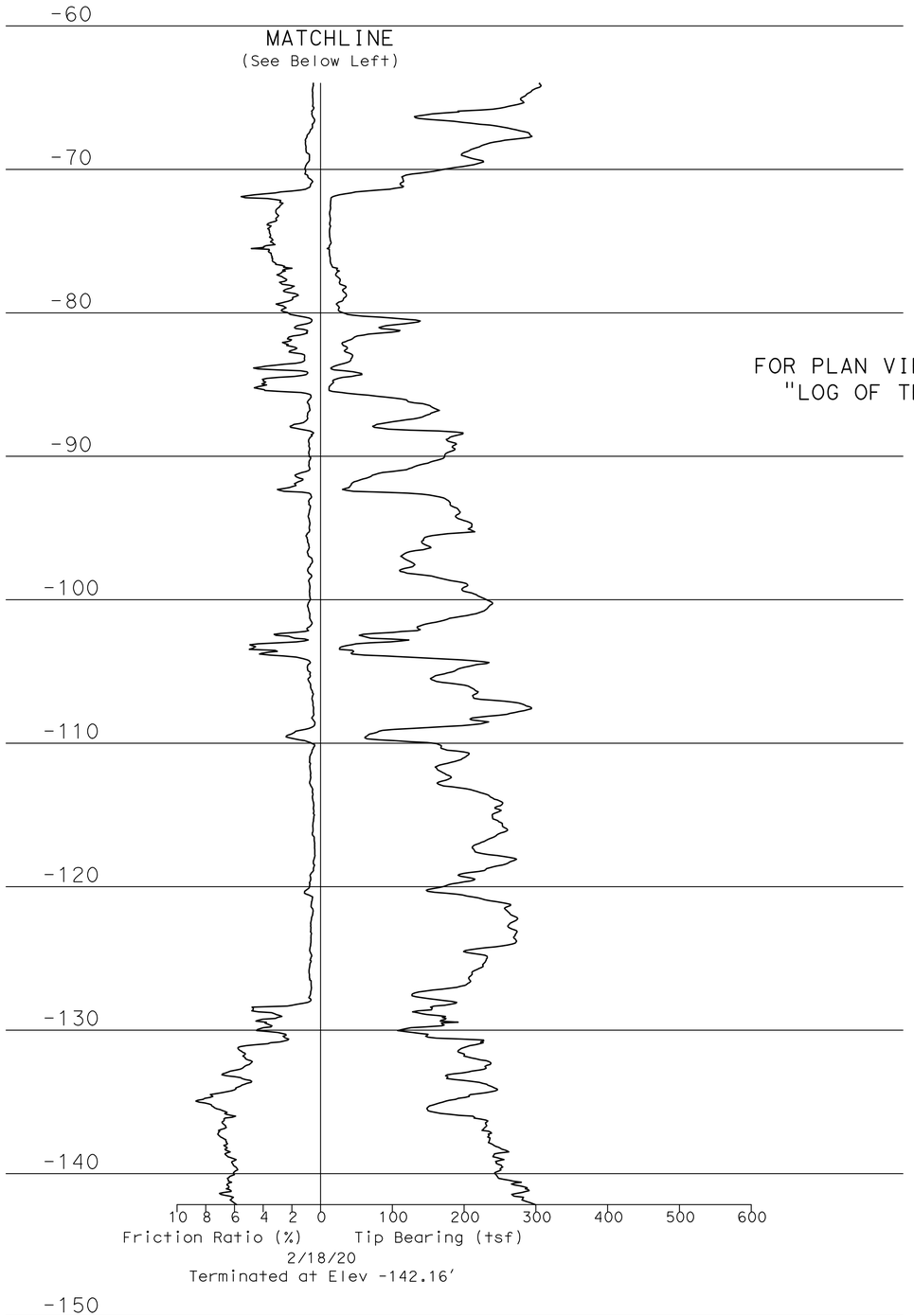
SHEET 3 OF 8 SHEETS

ORIGINAL SCALE: 0 1 INCHES 2 3 4


FOR PLAN VIEW AND ADDITIONAL NOTES, SEE "LOG OF TEST BORINGS" SHEET 1 OF 8
Station 159+06
Offset 23.6 Rt
R-20-002
8"
~Elev. 16.00
ASPHALT CONCRETE; (6")
POORLY GRADED SAND (SP); light brownish gray (10YR 6/2); moist; trace subrounded GRAVEL, 2 in. max. dia.; mostly medium to fine SAND; non-plastic; micaceous (ARTIFICIAL FILL (af)).
POORLY GRADED SAND with SILT (SP-SM); medium dense; light brownish gray (10YR 6/2); moist; mostly medium to fine SAND; little fines; non-plastic
- loose; trace shell fragments
POORLY GRADED SAND with SILT (SP-SM); very loose; brown (10YR 5/3); moist; mostly medium to fine SAND; little fines; non-plastic; micaceous (RECENT ALLUVIAL DEPOSITS (Qa)).
GWS Elev 5 2-10-20
- dark grayish brown (10YR 4/2); moist to wet
- very dark gray (10YR 3/1); wet; some fines; non-plastic to low plasticity; trace of odor
POORLY GRADED SAND (SP); loose; dark gray (10YR 4/1); wet; mostly medium to fine SAND; non-plastic; trace shell fragments, no odor, micaceous
GWS Elev -2 2-11-20
-gravelly layers from 16 to 18 feet
- medium dense
SILTY SAND (SM); loose; dark gray (10YR 4/1); wet; mostly medium to fine SAND; some fines; non-plastic; trace shell fragments
SILTY SAND (SM); dense; dark gray (10YR 4/1); trace subrounded GRAVEL, 3 in. max. dia.; mostly medium to fine SAND; some fines; non-plastic
POORLY GRADED SAND with SILT (SP-SM); dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; little fines; non-plastic (YOUNG ALLUVIAL DEPOSITS (Qya)).
4"
- SAA
SILTY SAND (SM); medium dense; dark gray (10YR 4/1); wet; mostly medium to fine SAND; some fines; non-plastic; increase in SILT content
- very dense; trace GRAVEL, 3 in. max. dia.; medium SAND; little fines
POORLY GRADED SAND (SP); medium dense; dark gray; wet; mostly medium to fine SAND; non-plastic; trace shell fragments
POORLY GRADED SAND with SILT (SP-SM); very dense; dark gray (10YR 4/1); mostly medium SAND; little fines; non-plastic
- medium dense
- very dense
- medium dense
- very dense
SILTY SAND (SM); loose; dark gray (10YR 4/1); wet; mostly fine SAND; some fines; non-plastic to low plasticity; micaceous, trace shell fragments (YOUNG ESTUARINE DEPOSITS (Qyes)). PP=0.5 tsf
SANDY SILT (ML); medium stiff; dark gray (10YR 4/1); wet; some fine SAND; mostly fines; non-plastic to low plasticity; PP=0.5 tsf
LEAN CLAY (CL); medium stiff; dark gray (10YR 4/1); wet; few fine SAND; mostly fines; low plasticity; micaceous, trace shell fragments; PP=0.5 tsf
SILTY SAND (SM); dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic; micaceous, trace shell fragments (OLD ALLUVIAL DEPOSITS (Qoa)).
- medium dense; some fines; non-plastic to low plasticity; interbeded layer (1") of Silty Clay material
- dense; little fines; non-plastic
- medium dense
SILTY SAND (SM); dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic
MATCHLINE
(See "Log of Test Borings 5 of 8")
PROFILE
HOR. 1"=30'
VERT. 1"=5'
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).
REVISION
DESCRIPTION
APPROVED
DATE
SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.
DESIGNED: D. Fahrney
DRAWN: D. Fahrney
CHECKED: J. Bontiglio
ENGINEER OF WORK
R.C.E. NO.
DATE
KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA 92101 (619) 831-4600
APPROVED
PUBLIC WORKS DIRECTOR
DATE
CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 - 6-SPAN OPTION
LOG OF TEST BORINGS
SHEET 4 OF 8 SHEETS
ORIGINAL SCALE:
INCHES


-80
-80
FOR PLAN VIEW AND ADDITIONAL NOTES, SEE
"LOG OF TEST BORINGS" SHEET 1 OF 8
-90
-90
MATCHLINE
(See "Log of Test Borings 4 of 8")
-100
-100
27 1.4
- medium dense; coarse to medium SAND
-110
54 2.4
M UW PA
- very dense
-110
21 1.4
- medium dense
-120
64 2.4
DS
- very dense
-120
10 1.4
PA PI
- loose; some medium to fine SAND; some fines; non-plastic to low plasticity; micaceous, increase in SILT content; PP=0.5 tsf
-130
59 2.4
M UW
SILTY SAND (SM); very dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic
-130
33 1.4
PA
POORLY GRADED SAND with SILT (SP-SM); dense; very dark gray; wet; mostly medium to fine SAND; little fines; non-plastic
-140
-140
75 2.4
DS
- very dense; coarse to medium SAND
-150
-150
16 1.4
PA
SILTY SAND (SM); medium dense; very dark gray; wet; some fines; non-plastic to low plasticity
-160
SILTY SAND (SM); medium dense; very dark gray (10YR 3/1); wet; mostly coarse to medium SAND; some fines; non-plastic to low plasticity
-160
SILTY CLAY with SAND (CL-ML); stiff; very dark gray (10YR 3/1); wet; little SAND; mostly fines; medium plasticity; PP=1.0 tsf
68 2.4
M UW PI
M UW
SILTY SAND (SM); very dense; very dark gray (10YR 3/1); wet; mostly medium to fine SAND; little fines; non-plastic
-170
-170
36 1.4
- dense
-180
-180
50/5 2.4
- very dense; olive gray (5Y 5/2); trace subrounded GRAVEL, 1 in. max. dia.; coarse to medium SAND; little fines; iron oxide staining
-190
SILTY SAND (SM); very dense; olive gray (5Y 5/2); trace subrounded GRAVEL, 1 in. max. dia.; mostly coarse to medium SAND; little fines
-190
02-13-20
Terminated at Elev ~-192.00
Hammer Energy Ratio (ERi) = 94%
-200
-200
-210
-210
-220
-220
-230
-230
PROFILE
HOR. 1"=30'
VERT. 1"=5'
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).
REVISION
DESCRIPTION
APPROVED
DATE
SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.
DESIGNED: D. Fahrney
DRAWN: D. Fahrney
CHECKED: J. Bonfiglio
ENGINEER OF WORK
R.C.E. NO.
DATE
KLEINFELDER
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550 WEST C STREET, SUITE 1200 SAN DIEGO, CA. 92101 (619) 831-4600
APPROVED
PUBLIC WORKS DIRECTOR
DATE
CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 - 6-SPAN OPTION
LOG OF TEST BORINGS
SHEET 5 OF 8 SHEETS
ORIGINAL SCALE:
0 1 INCHES 2 3 4





This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE "LOG OF TEST BORINGS" SHEET 1 OF 8

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: D. Fahrney | DRAWN: D. Fahrney | CHECKED: J. Bonfiglio

ENGINEER OF WORK | R.C.E. NO. | DATE

KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA. 92101 (619) 831-4600

APPROVED

PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR

CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

SHEET 6 OF 8 SHEETS

ORIGINAL SCALE: 6 1 1 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1 3 1 1 1 1 1 1 1 1 4 INCHES

20

10

Station 162+90
Offset 22.51 Rt

CPT-20-002A

0 Elev 0′

-10

-20

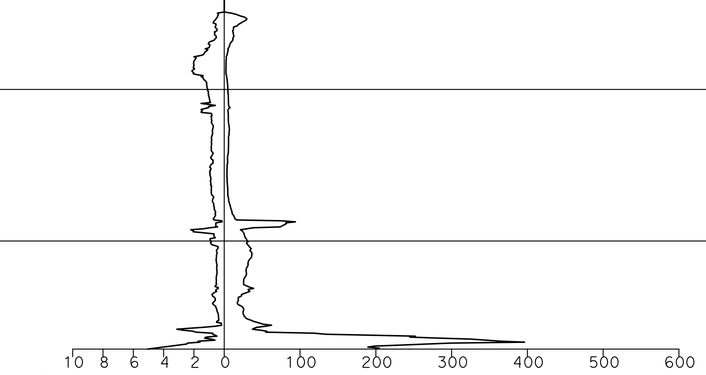
-30

-40

-50

-60

-70



2/21/20
Terminated at Elev -37.13′

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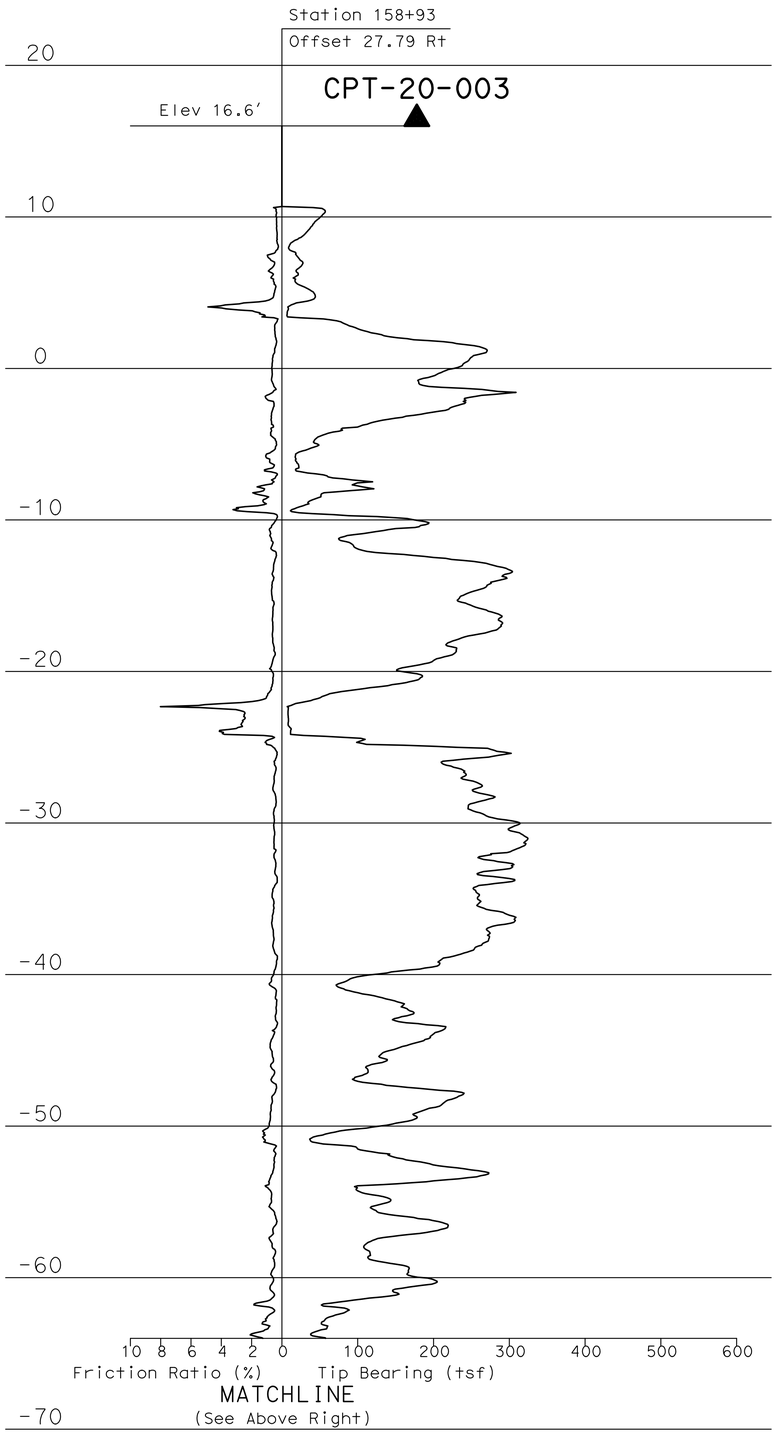
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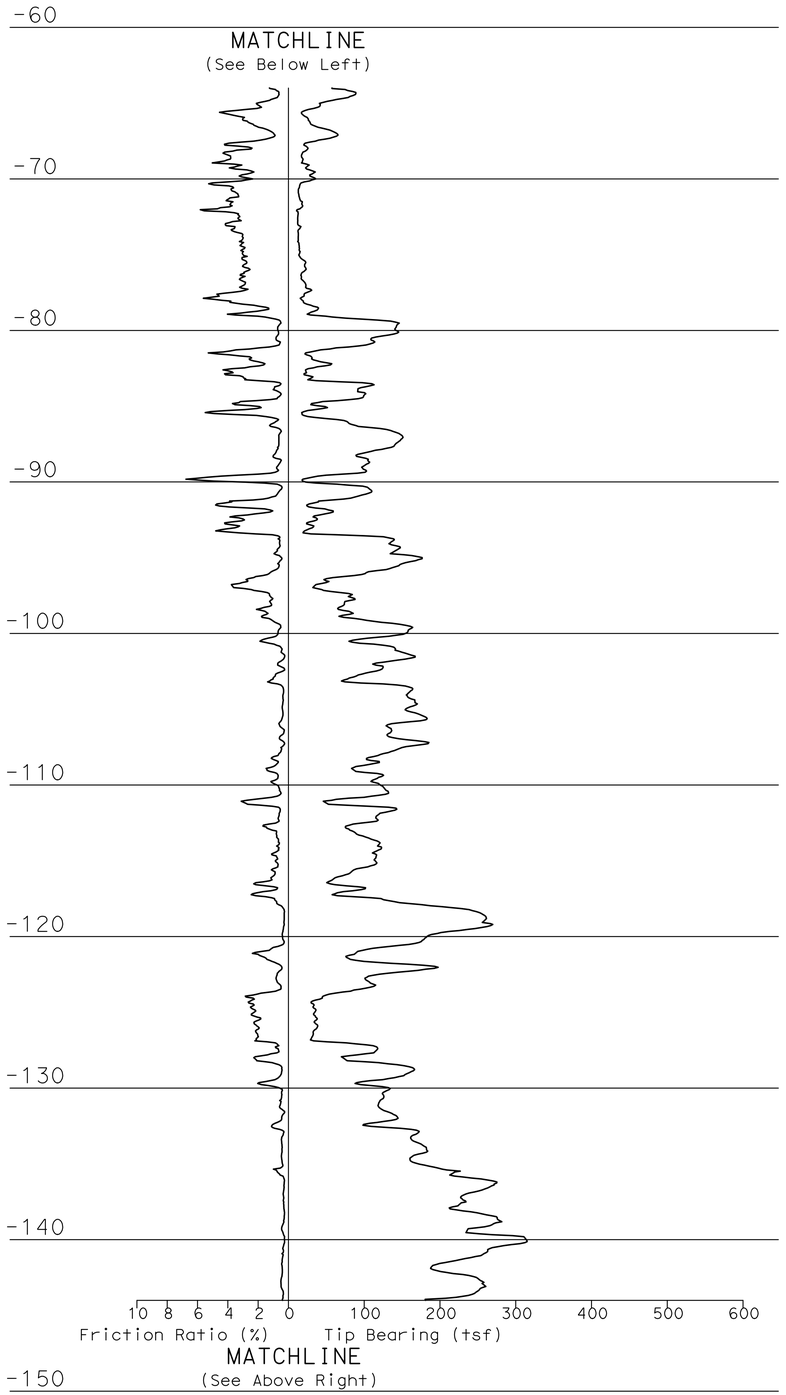
PUBLIC WORKS DIRECTOR DATE

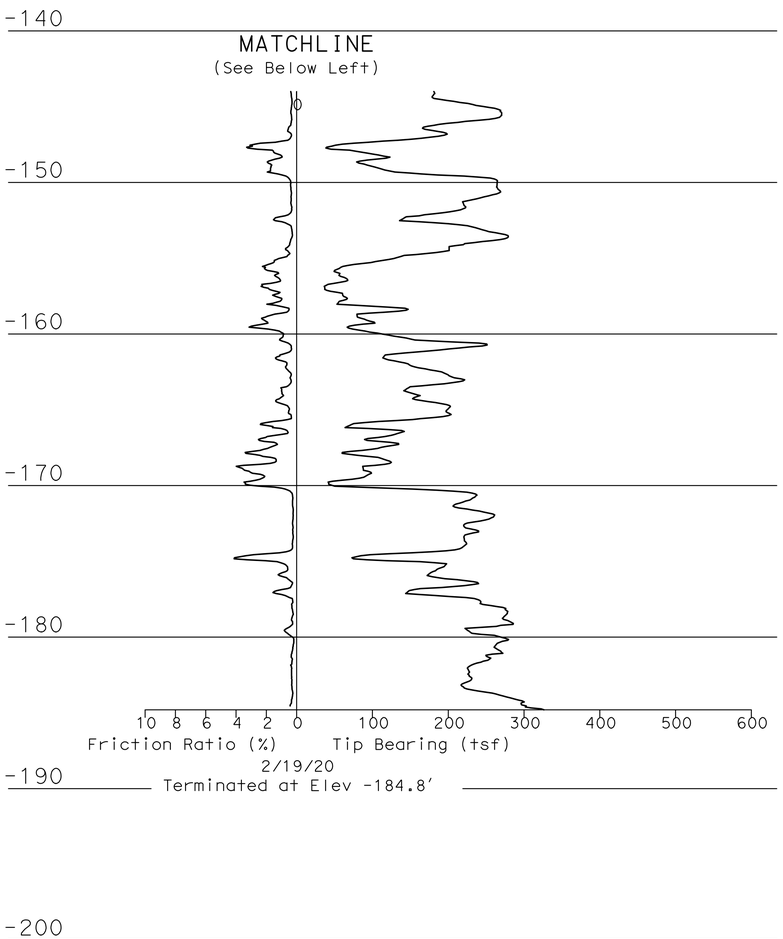
CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

SHEET 7 OF 8 SHEETS

ORIGINAL SCALE: 0 1 1 1 1 1 1 INCHES 2 1 1 1 1 1 3 1 1 1 1 4







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REVISION	DESCRIPTION	APPROVED	DATE

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ACAD FILE NO.
PROJECT NO.

DESIGNED:	DRAWN:	CHECKED:
D. Fahrney	D. Fahrney	J. Bonfiglio

ENGINEER OF WORK R.C.E. NO. DATE

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APPROVED

PUBLIC WORKS DIRECTOR DATE

CITY OF DEL MAR

CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1 – 6-SPAN OPTION
LOG OF TEST BORINGS

SHEET 8 OF 8 SHEETS

ORIGINAL SCALE: 6 1 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1 31 1 1 1 1 1 1 1 1 4 INCHES

APPENDIX E
PREVIOUS RELEVANT GEOTECHNICAL INFORMATION BY OTHERS

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APPENDIX E
PREVIOUS RELEVANT GEOTECHNICAL INFORMATION BY OTHERS

E.1 California Department of Public Works 1960 LOTBs

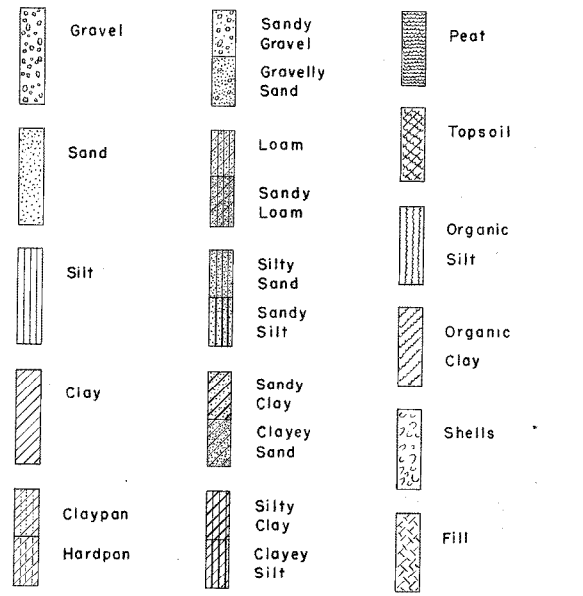
E.2 Ninyo & Moore 2018 Exploration Logs

E.3 Ninyo & Moore 2018 Laboratory Test Results

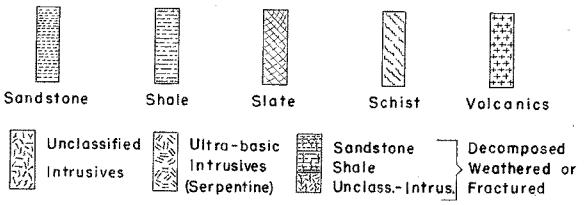
E.1 California Department of Public Works 1960 LOTBs

GEOLOGIC LEGEND

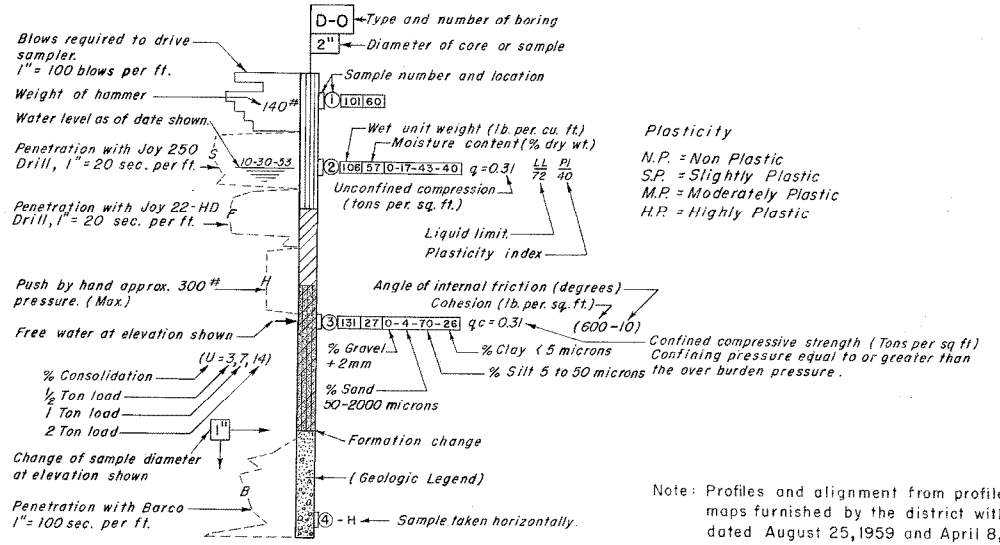
SOIL TYPES



ROCK TYPES



BORING LEGEND
CROSS-SECTION & PROFILE SHEETS



Plasticity

N.P. = Non Plastic
S.P. = Slightly Plastic
M.P. = Moderately Plastic
H.P. = Highly Plastic

Note: Profiles and alignment from profile and contour maps furnished by the district with letters dated August 25, 1959 and April 8, 1960.

NOTE - All borings are numbered consecutively regardless of type of boring

BORING LEGEND - PLAN SHEETS

●A-0	Auger (Continuous helix)	●R-0	Rotary Boring
●B-0	Bucket Boring	●J-0	Jetted Boring
●C-0	Core Boring	×V-0	Vane borer test
●C-0(E)	Electric log of Boring	■SP-0	Settlement Platform
●D-0	Drive Boring made by Hdqtrs. Lab.	▲Z-0	Piezometer
●D-0(P)	Probe Boring	⊗	2" Boring placed by Dist.
●-0	1" Boring placed by Dist.		

STATE OF CALIFORNIA DIVISION OF HIGHWAYS
MATERIALS & RESEARCH DEPARTMENT

FOUNDATION INVESTIGATION

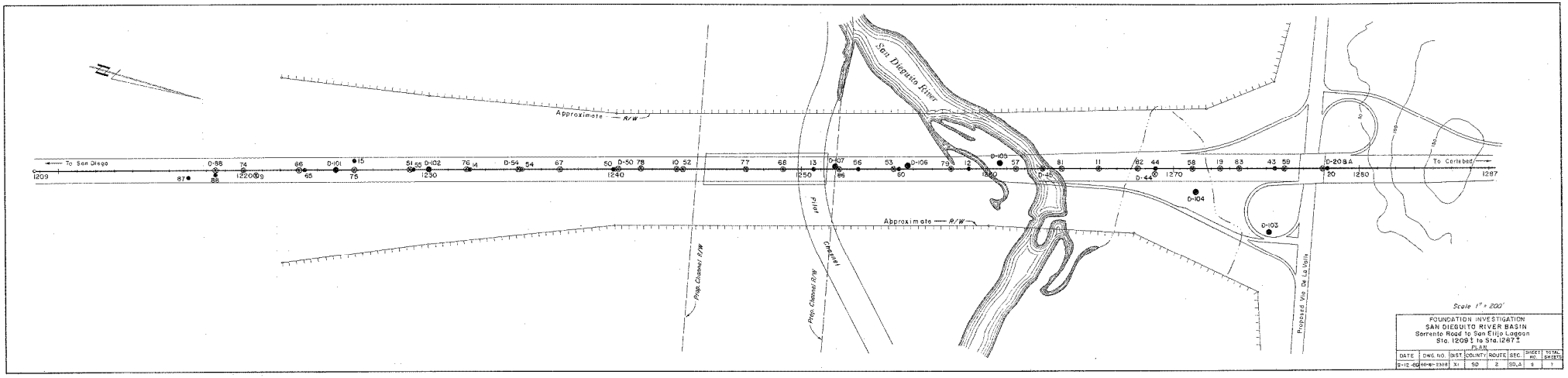
Road XI-SD-2-SD,A

Sorrento Road to San Elijo Lagoon

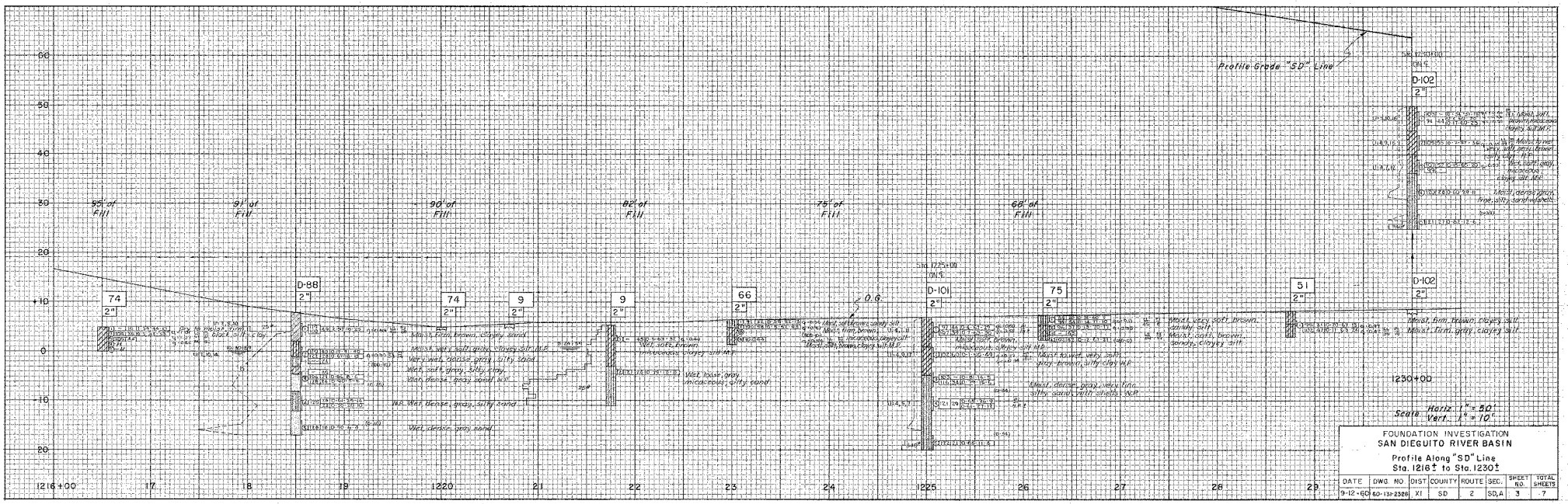
San Dieguito River Basin

LEGEND SHEET

DWG. NO. 60-130-2328	SUBMITTED BY: A. W. Root SUPV. MATERIALS & RESEARCH ENG'R.	DATE 9-12-60
DRAWN BY R.P.	APPROVED BY: F. N. Hveem MATERIALS & RESEARCH ENG'R.	SHEET NO. 1 OF 7 SHEETS
CHECKED BY W.F.K.		



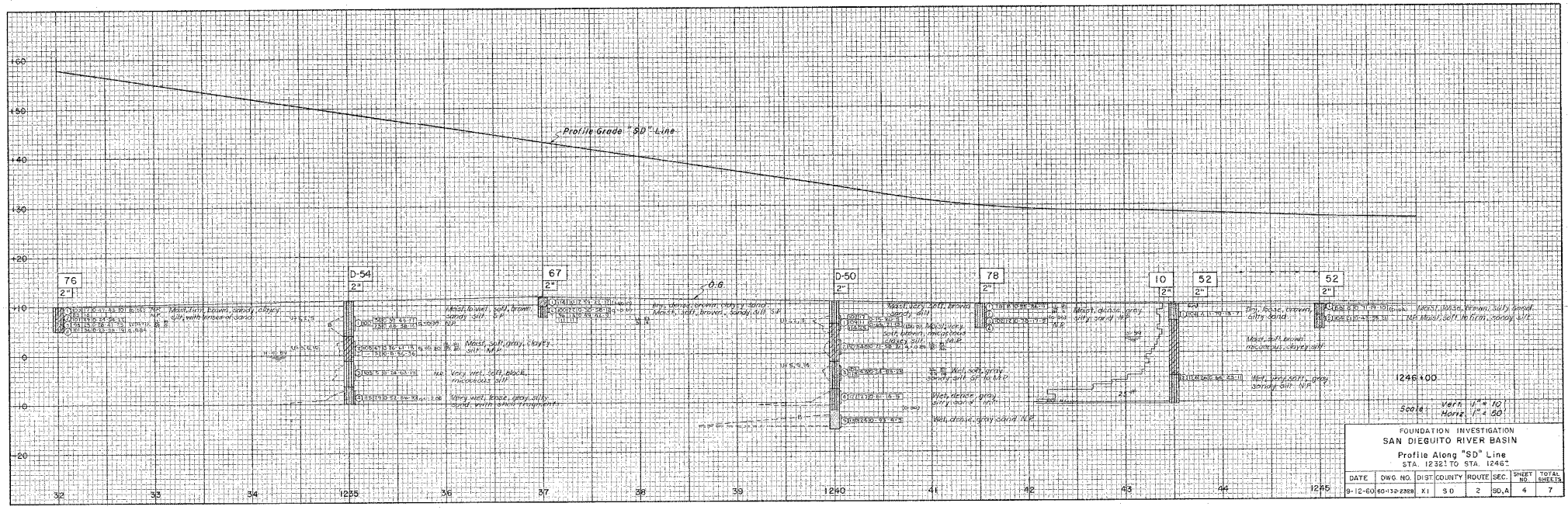
DATE	DWG. NO.	DIST	COUNTY	ROUTE	SEC	SHEET NO.	TOTAL SHEETS
9-12-62	60-GI-2308	XI	SD	2	SD.A	9	1

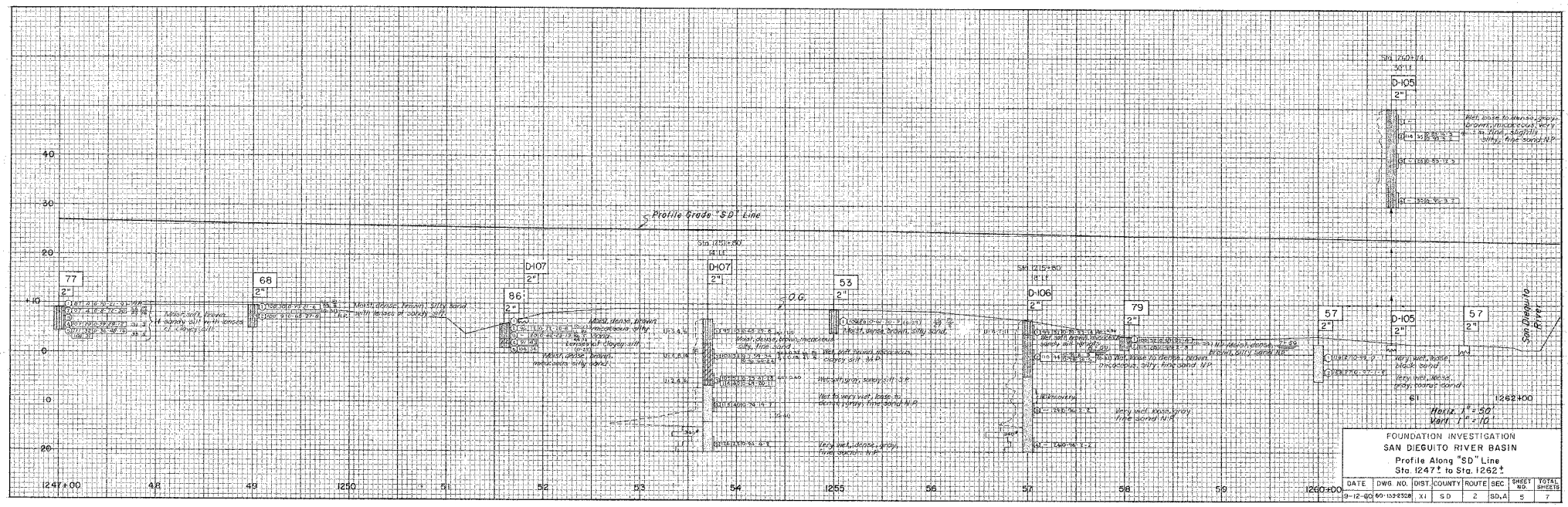


FOUNDATION INVESTIGATION
SAN DIEGUITO RIVER BASIN

Profile Along "SD" Line
Sta. 1216± to Sta. 1230±

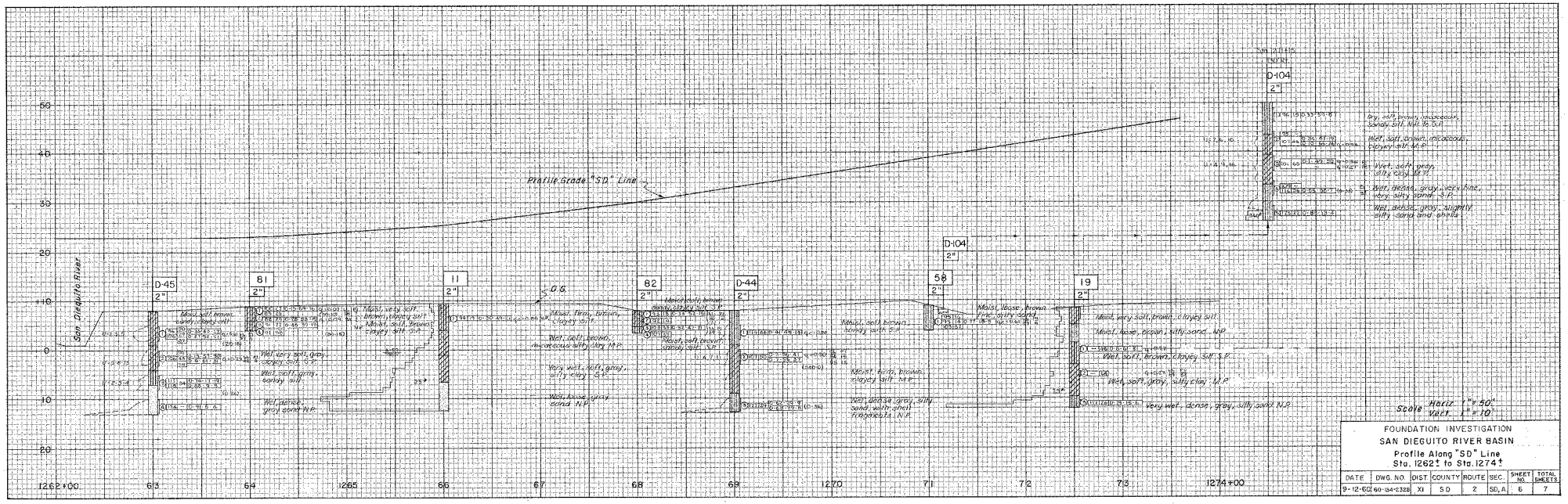
DATE	DWG. NO.	DIST	COUNTY	ROUTE	SEC.	SHEET NO.	TOTAL SHEETS
9-12-60	60-131-2326	XI	SD	2	SD,A	3	7


Profile Grade "SD" Line
76
D-54
67
D-50
78
10
52
52
1246+00
Scale
Vert 1" = 10'
Horz 1" = 50'
FOUNDATION INVESTIGATION
SAN DIEGUITO RIVER BASIN
Profile Along "SD" Line
STA. 1232+ TO STA. 1246+
DATE
DWG. NO.
DIST.
COUNTY
ROUTE
SEC.
SHEET NO.
TOTAL SHEETS
9-12-60
60-132-2388
XI
SD
2
SD,A
4
7



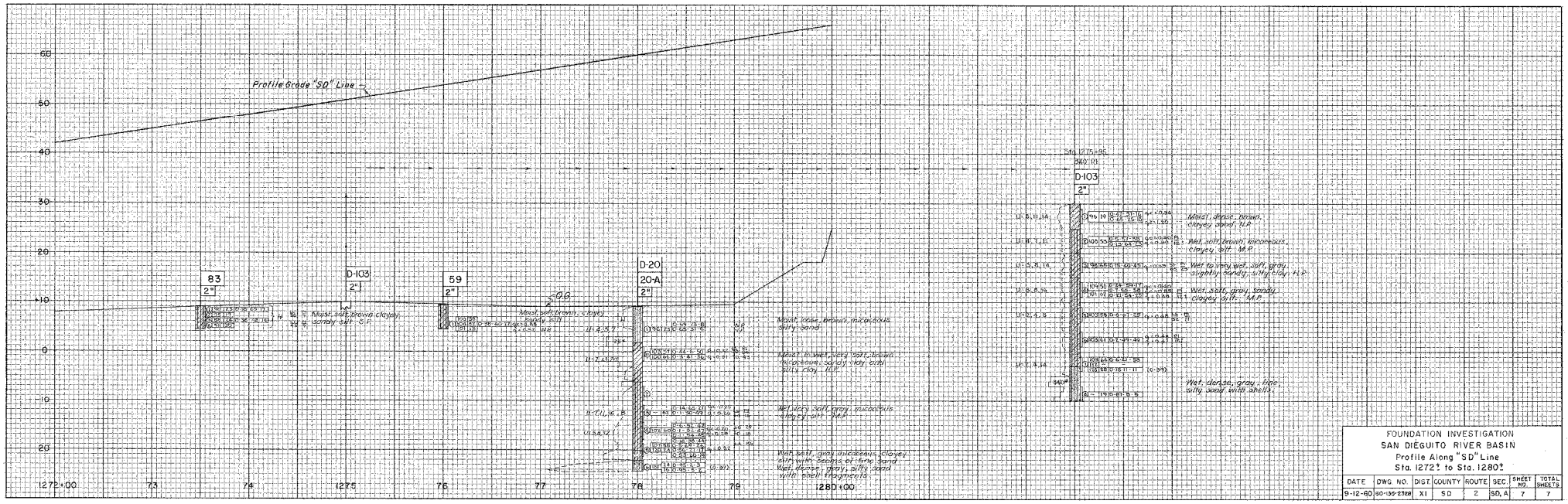
FOUNDATION INVESTIGATION
SAN DIEGUITO RIVER BASIN
Profile Along "SD" Line
Sta. 1247± to Sta. 1262±

DATE	DWG. NO.	DIST.	COUNTY	ROUTE	SEC	SHEET NO.	TOTAL SHEETS
9-12-80	60-133-2328	XI	SD	2	SD,A	5	7



FOUNDATION INVESTIGATION
SAN DIEGUITO RIVER BASIN
Profile Along "SD" Line
Sta. 1262+ to Sta. 1274+

DATE	DWG. NO.	DIST	COUNTY	ROUTE	SEC.	SHEET NO.	TOTAL SHEETS
9-12-60	60-134-2328	XI	SD	2	SD, A	6	7



FOUNDATION INVESTIGATION
SAN DIEGUITO RIVER BASIN
Profile Along "SD" Line
Sta. 1272± to Sta. 1280±

DATE	DWG. NO.	DIST.	COUNTY	ROUTE	SEC.	SHEET NO.	TOTAL SHEETS
9-12-60	60-136-2328	XI	SD	2	SD, A	7	7

STRATIOGRAPHIC SECTION
SITE PROPOSED BRIDGE OVER
SAN DIEGUITO RIVER
VII - S D - Z - A

FEB. 1931 SCALES Hor. 1"=50ft. Vert 1"=10ft

LEGEND

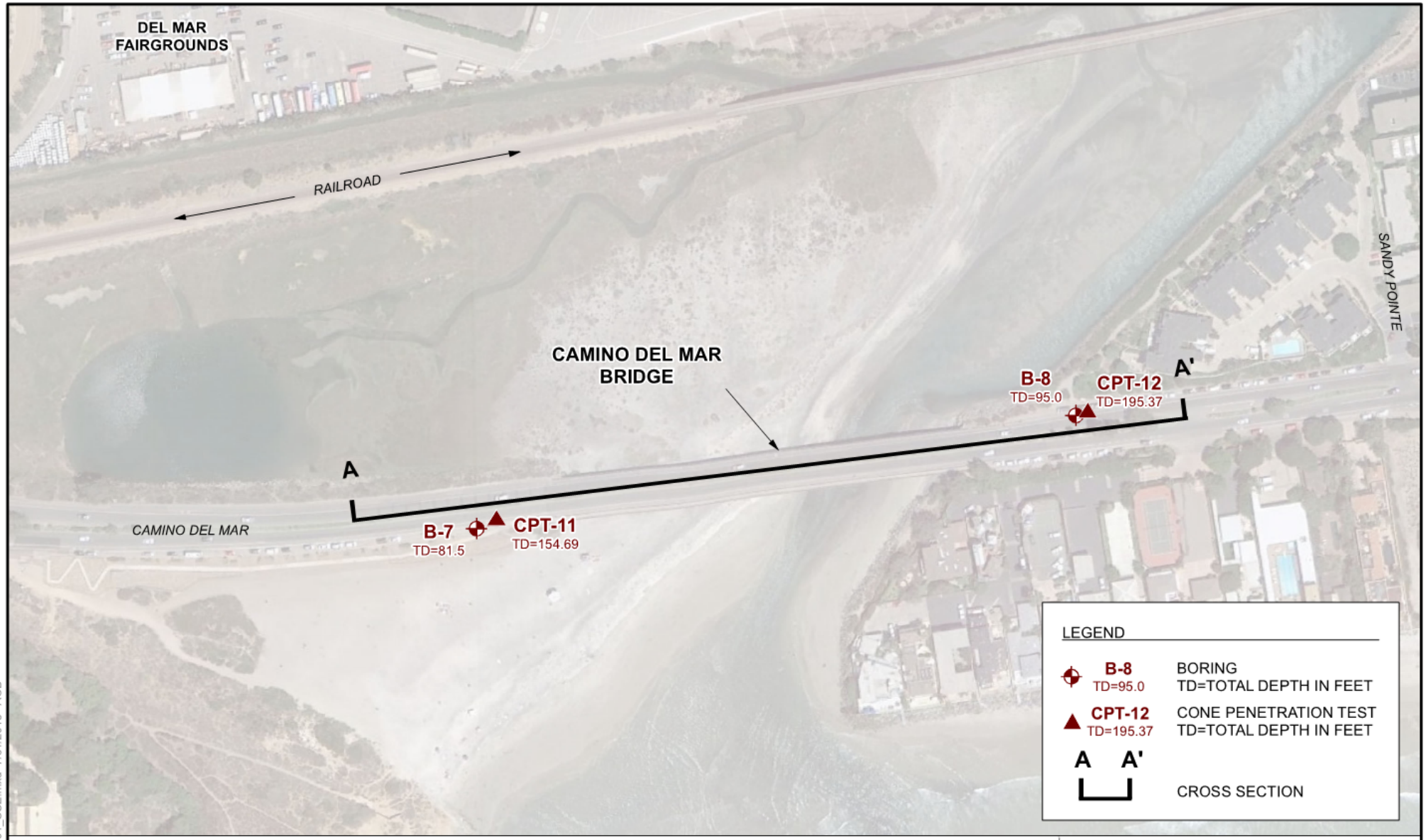
CLAY

SAND

GRAVEL

SHELLS

E.2 Ninyo & Moore 2018 Exploration Logs



SOURCE: GOOGLE EARTH, 2013.

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

N

FEET

0 200 400

2_108449001_SSE.mxd 7/31/2018 AOB

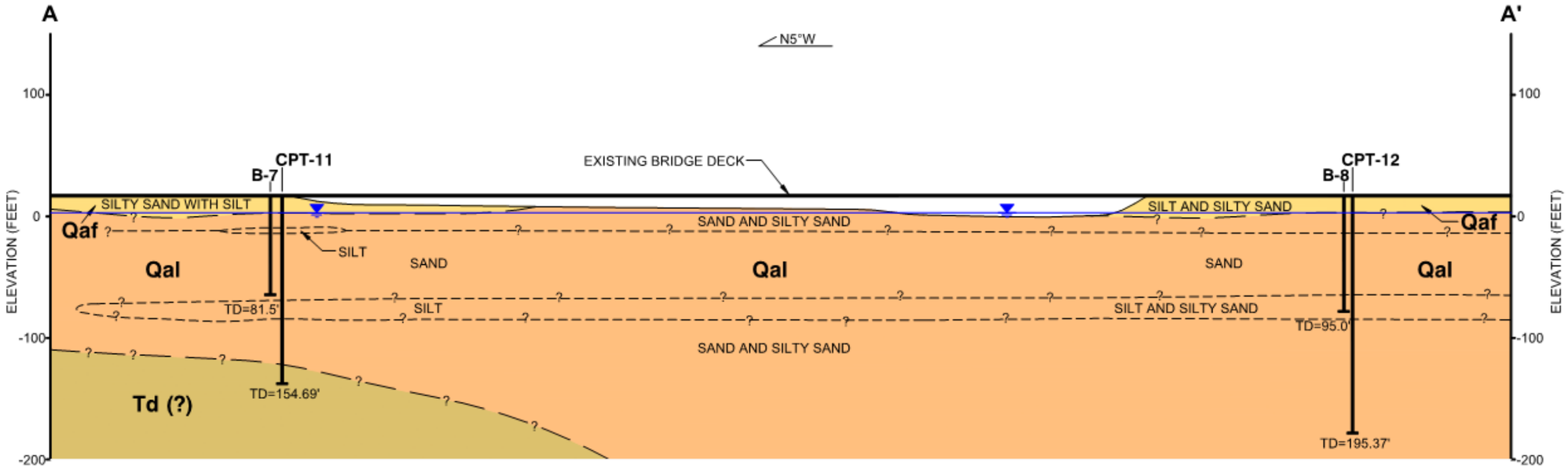
FIGURE 2

SUBSURFACE EXPLORATIONS

CAMINO DEL MAR BRIDGE REPLACEMENT
DEL MAR, CALIFORNIA

108449001 | 7/18

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants



LEGEND

B-8 (TD=95.0')	BORING TD=TOTAL DEPTH IN FEET
CPT-12 (TD=195.37')	CPT BORING TD=TOTAL DEPTH IN FEET
Qaf	FILL
Qal	ALLUVIUM
Td	DELMAR FORMATION
— ? —	GEOLOGIC CONTACT, QUERIED WHERE UNCERTAIN
▼	GROUNDWATER ELEVATION

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

N

FEET
0 100 200

4 108449001 CS A-A' DWG

FIGURE 4

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

GEOLOGIC CROSS SECTION A-A'

CAMINO DEL MAR BRIDGE REPLACEMENT
DEL MAR, CALIFORNIA

108449001 I 7/18

BENCH MARK

VERTICAL BENCHMARK: 2" CO SD BRASS DISK IN MON WELL, PC JIMMY DURANTE BOULEVARD 600 FEET NORTHEAST OF JIMMY DURANTE WAY (SOUTH) PER RECORD OF SURVEY 14492.

DATUM: NAVD88 ELEVATION: 13.32'

BASIS OF BEARINGS: THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM NAD 83, ZONE 6, EPOCH 1991.35 BETWEEN POINT NUMBERS 195 AND 459 AS SHOWN ON ROS 14492.

REFERENCE

KLEINFELDER, DATED 05/22/17.



PLAN
1"=40'

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	–	--	4	5

Soumitra Guha -/--/--
REGISTERED CIVIL ENGINEER DATE

REGISTERED PROFESSIONAL ENGINEER * SOUMITRA GUHA No. GE 2632 EXP. 06/30/19 GEOTECHNICAL * STATE OF CALIFORNIA

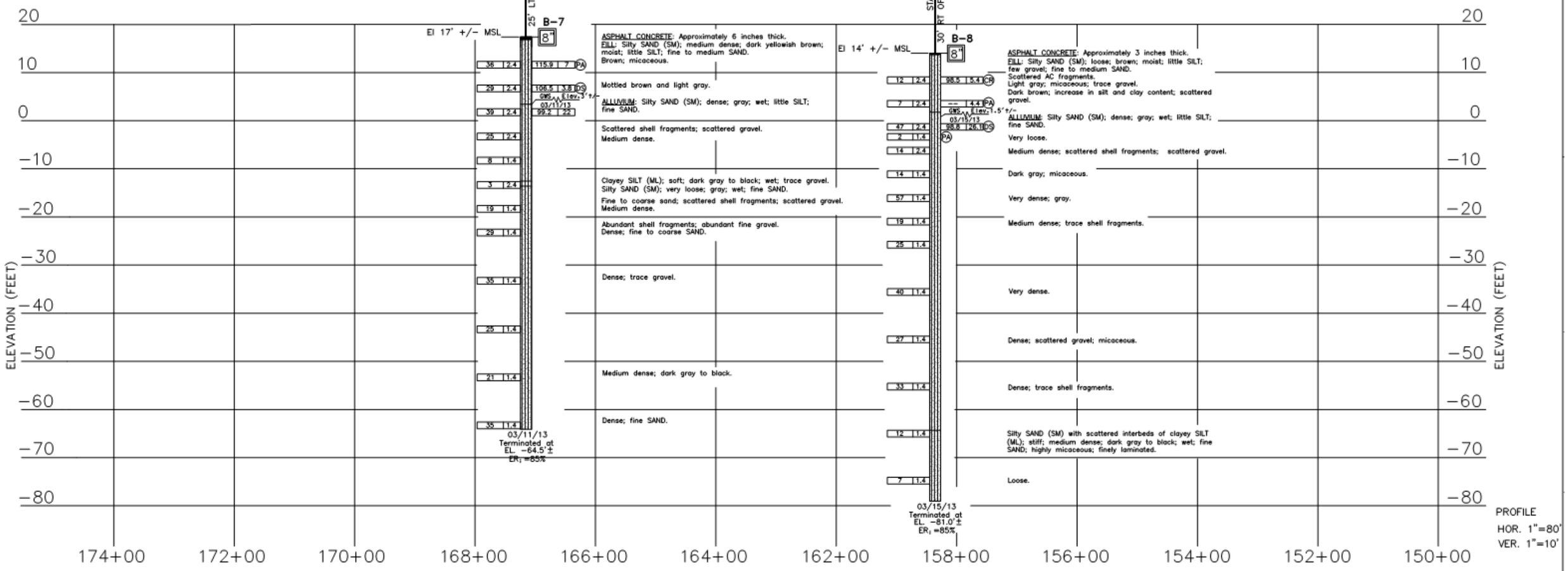
PLANS APPROVAL DATE

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--

NINYO & MOORE
5710 Ruffin Road
San Diego, CA 92123
Phone (858) 576-1000

NOTES:
1. THIS LOG OF TEST BORINGS WAS PREPARED IN ACCORDANCE WITH THE CALTRANS SOIL & ROCK LOGGING CLASSIFICATION, AND PRESENTATION MANUAL (2010).
2. 2.4" SAMPLES WERE TAKEN WITH A CALIFORNIA MODIFIED SAMPLER AND 1.4" SAMPLES WERE TAKEN WITH A STANDARD PENETRATION TEST (SPT) SAMPLER.
3. AN AUTOMATIC TRIP HAMMER SYSTEM CONSISTING OF A HAMMER WEIGHT OF 140 LBS. FALLING FROM A HEIGHT OF 30" WAS USED TO ADVANCE THE DRIVE SAMPLES.



-- DESIGN OVERSIGHT	DRAWN BY	ALEXIS BALANE	NINYO & MOORE FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	-- PROJECT ENGINEER	BRIDGE NO. 57C-0209	CAMINO DEL MAR BRIDGE REPLACEMENT
SIGN OFF DATE	CHECKED BY	SOUMITRA GUHA	DATE: 03/11/13, 03/13/13, AND 03/15/13			POST MILES --	LOG OF TEST BORINGS

GS CIVIL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU: --
EA: --

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES				SHEET	OF
1				4	5

BENCH MARK

VERTICAL BENCHMARK: 2" CO SD BRASS DISK IN MON WELL, PC JIMMY DURANTE BOULEVARD 600 FEET NORTHEAST OF JIMMY DURANTE WAY (SOUTH) PER RECORD OF SURVEY 14492.

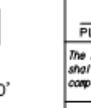
DATUM: NAVD88 ELEVATION: 13.32'

BASIS OF BEARINGS: THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM NAD 83, ZONE 6, EPOCH 1991.35 BETWEEN POINT NUMBERS 195 AND 459 AS SHOWN ON ROS 14492.

REFERENCE

KLEINFELDER, DATED 05/22/17.





DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
11	SD	–	--	5	5

Soumitra Guha --/--/--
REGISTERED CIVIL ENGINEER DATE

REGISTERED PROFESSIONAL ENGINEER
SOUMITRA GUHA
No. GE 2632
Exp. 06/30/19
GEOTECHNICAL
STATE OF CALIFORNIA

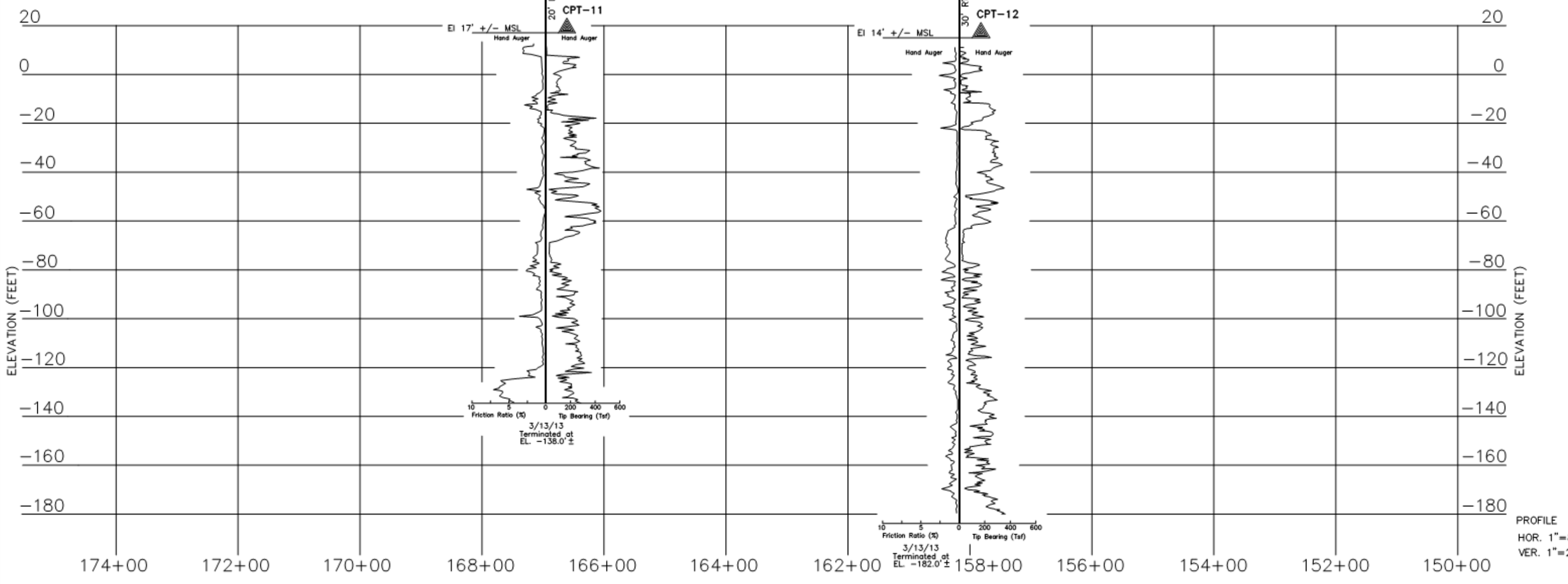
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-- DESIGN OVERSIGHT	DRAWN BY	ALEXIS BALANE	NINYO & MOORE	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	-- PROJECT ENGINEER	BRIDGE NO. 57C-0209	CAMINO DEL MAR BRIDGE REPLACEMENT
SIGN OFF DATE	CHECKED BY	SOUMITRA GUHA	FIELD INVESTIGATION BY: DATE: 03/11/13, 03/13/13, AND 03/15/13			POST MILES --	LOG OF TEST BORINGS

GS CIVIL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU: -- EA: --

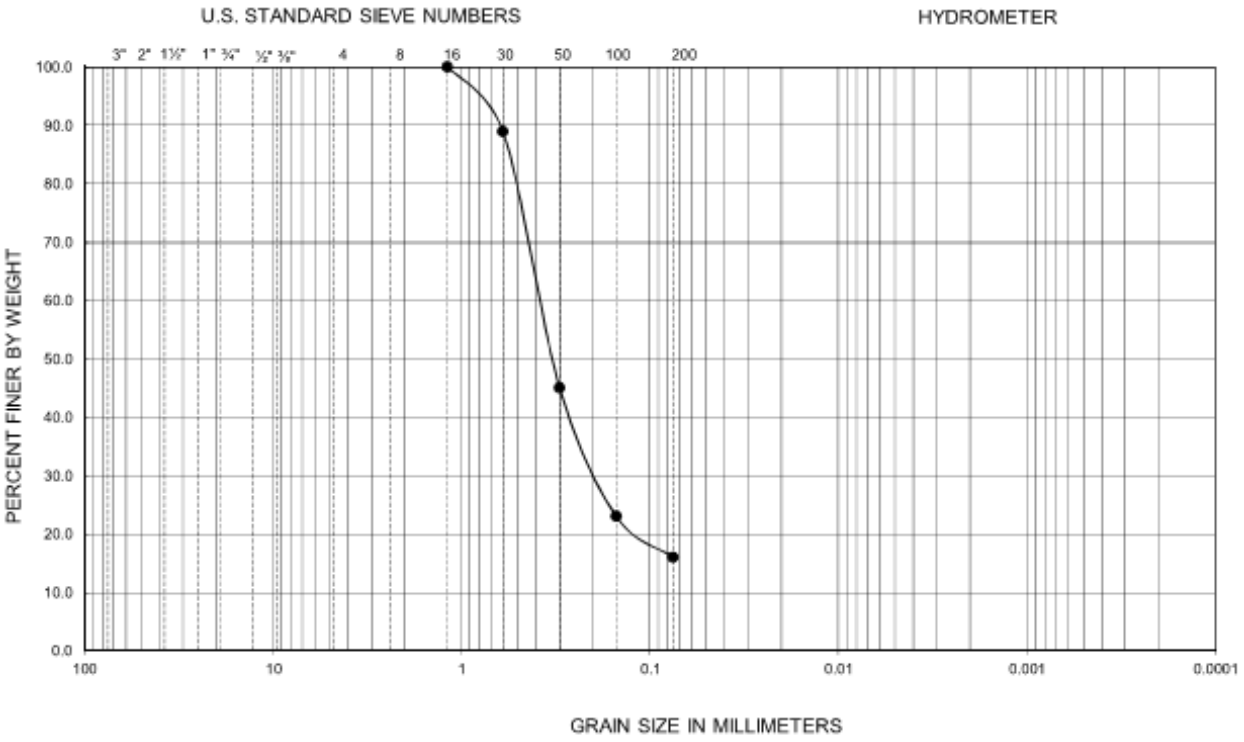
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES

SHEET 5 OF 5

E.3 Ninyo & Moore
2018 Laboratory
Test Results

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



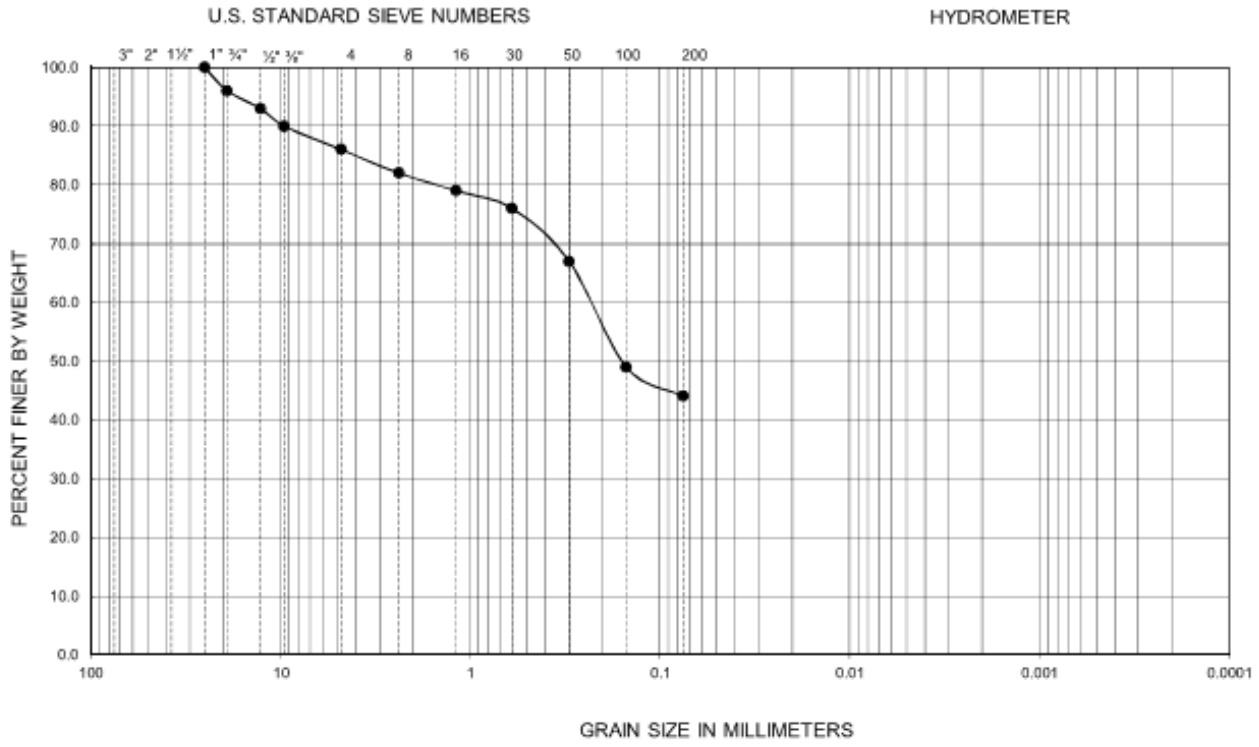
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	USCS
●	B-7	5.0-6.5	--	--	--	--	--	--	--	--	16	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-1
108449001 / 7/18		

108449001_SIEVE B-7 @ 5.0-6.5.xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY

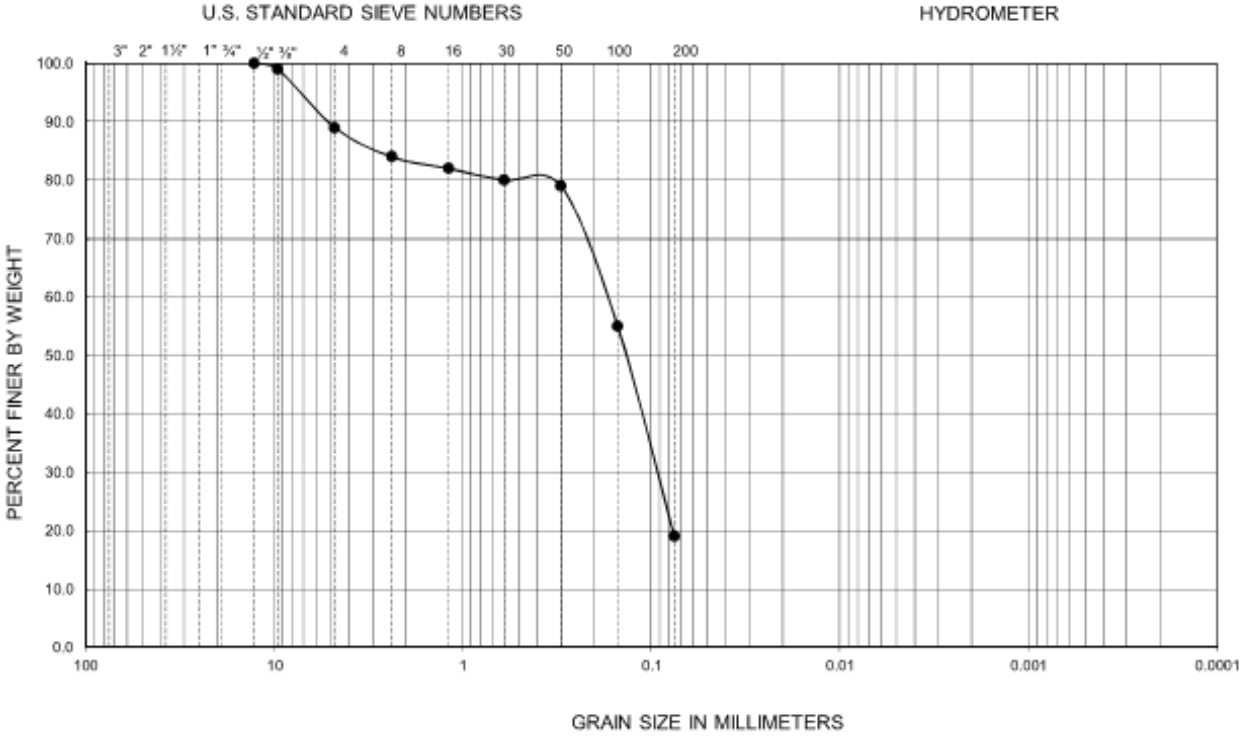


Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	USCS
●	B-8	10.0-11.5	--	--	--	--	--	--	--	--	44	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. 108449001 / DATE 7/18	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-2

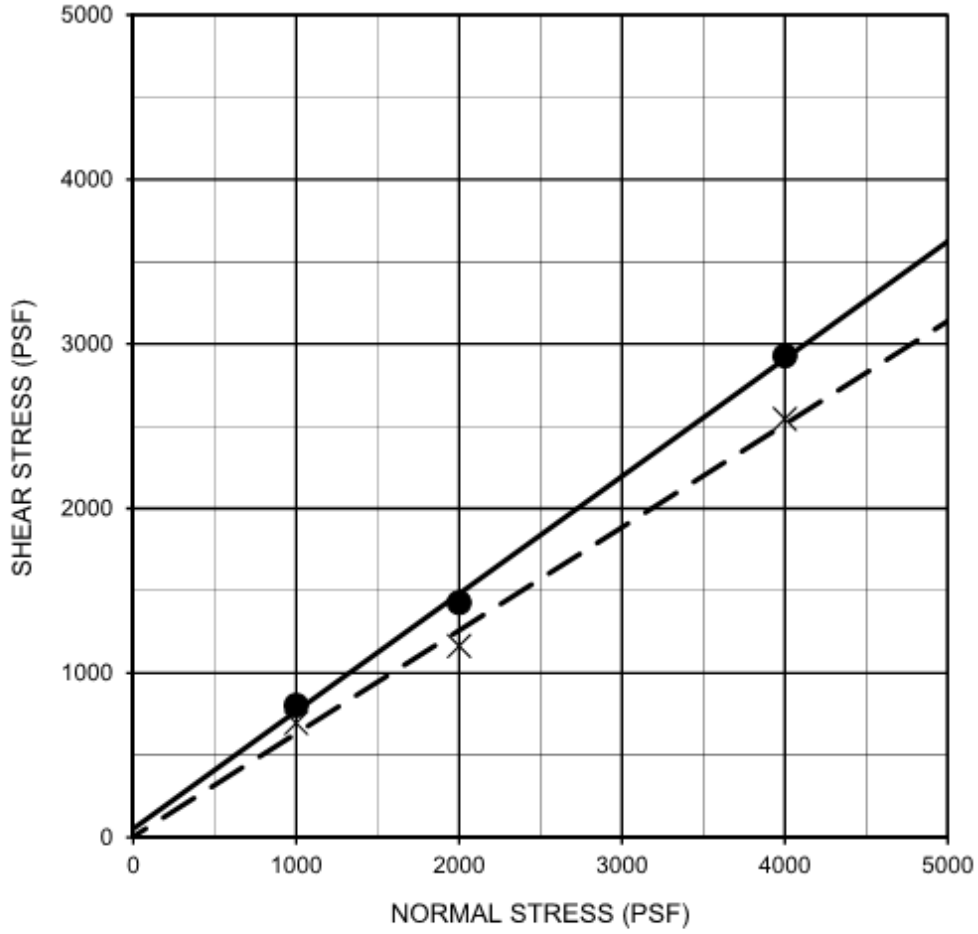
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	USCS
●	B-8	17.0-18.5	--	--	--	--	--	--	--	--	19	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

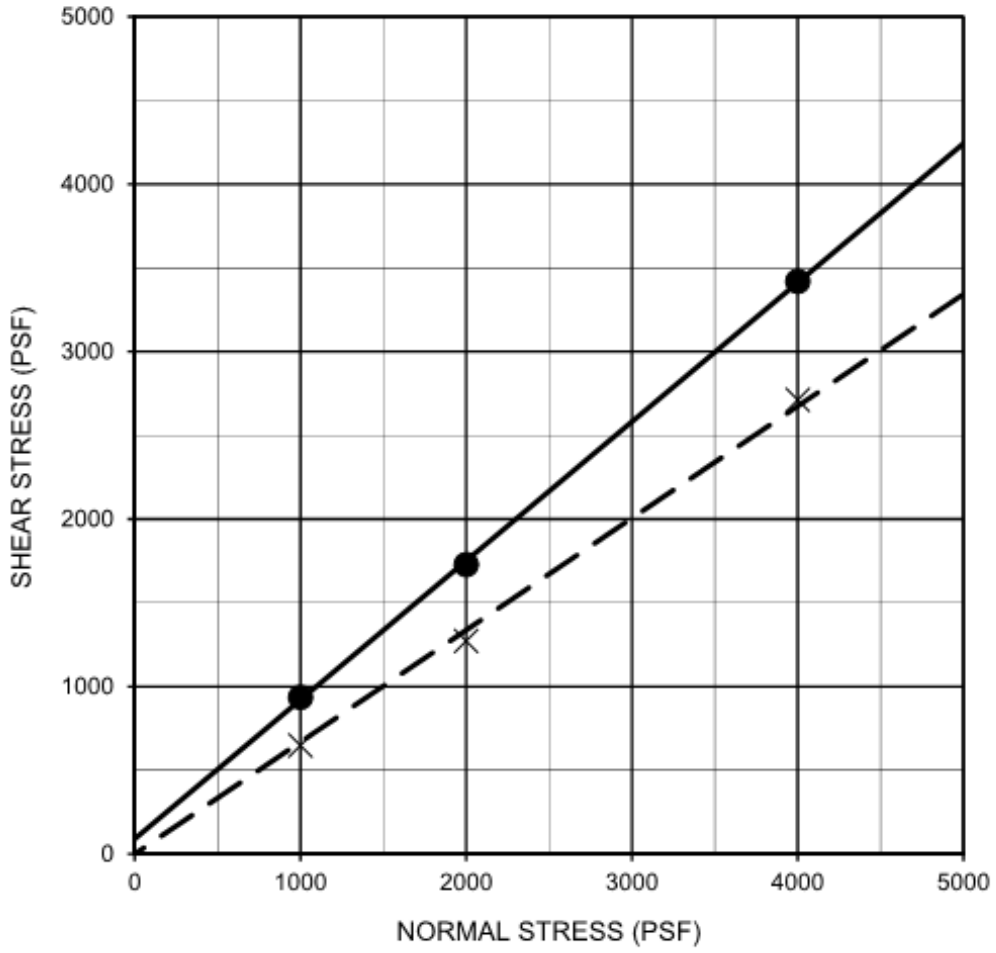
Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. 108449001 / DATE 7/18	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-3



Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
Silty SAND	—●—	B-7	10.0-11.5	Peak	50	36	SM
Silty SAND	- - x - -	B-7	10.0-11.5	Ultimate	10	32	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

Ninyo & Moore	DIRECT SHEAR TEST RESULTS	FIGURE
PROJECT NO. / DATE	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-4
108449001 / 7/18		



Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
Silty SAND	—●—	B-8	15.0-16.5	Peak	90	40	SM
Silty SAND	– – X – –	B-8	15.0-16.5	Ultimate	0	35	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

Ninyo & Moore	DIRECT SHEAR TEST RESULTS	FIGURE
PROJECT NO. 108449001 / DATE 7/18	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-5

SAMPLE LOCATION	SAMPLE DEPTH (FT)	pH [1]	RESISTIVITY [1] (Ohm-cm)	SULFATE CONTENT [2]		CHLORIDE CONTENT [3] (ppm)
				(ppm)	(%)	
B-8	5.0-6.5	8.4	10,000	40	0.004	50

[1] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643
[2] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417
[3] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

Ninyo & Moore	CORROSIVITY TEST RESULTS	FIGURE
PROJECT NO. 108449001 / DATE 7/18	CAMINO DEL MAR BRIDGE REPLACEMENT DEL MAR, CALIFORNIA	C-6

APPENDIX F
SITE RESPONSE ANALYSIS

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APPENDIX F
SITE RESPONSE ANALYSIS

INTRODUCTION

This appendix presents the results of Kleinfelder's site response analysis for the Camino Del Mar Bridge Replacement project over the San Dieguito River in Del Mar, California. Based on the results of our current subsurface investigation, previous subsurface investigations by others, and preliminary engineering analyses, there is a significant liquefaction hazard at the site. Accordingly, the project site is classified as Soil Profile Type F per the 2019 Caltrans Seismic Design Criteria (SDC) V2.0 (Caltrans, 2019). Therefore, Caltrans SDC requires that a site response analysis be performed.

The purpose of this analysis is to develop a site-specific design acceleration response spectrum in accordance with the requirements of the 2019 Caltrans SDC V2.0 and the American Association of State Highway Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications, 8th Edition, with California Amendments (Caltrans, 2019). The site-specific design acceleration response spectrum developed from this analysis will be used for the seismic design of the proposed replacement bridge and other ancillary structures at the site.

The site response analysis relies upon data from the field and laboratory investigations completed for the project as presented in Sections 2 and 3 and in Appendices A through E of this report.

Project Understanding

As discussed in Section 1.4 of this report, the proposed project is still in the bridge type selection phase and five bridge options are still currently being considered for replacement of the existing Camino Del Mar Bridge which spans the San Dieguito River channel. These alternatives consist of three 5-span and 6-span cast-in-place box girder bridge options as well as two 6-span precast concrete girder bridge options. Large diameter Cast-In-Drilled-Hole (CIDH) type piles with permanent steel casing are recommended for support of the piers and abutments of the proposed replacement bridge. Ancillary structures proposed for the project include Caltrans Standard cantilever-type retaining walls along each side of the northern and southern bridge approaches. These retaining walls will support new approach fill in order to raise grades for to accommodate the design storm water level.

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Based on discussions with the project structural engineer, we understand that the longitudinal and transverse fundamental periods of the proposed bridge alternatives range from approximately 0.5 to 1.4 seconds and 0.7 to 1.3 seconds, respectively, for the various alternatives.

At this time, it is our understanding that ground motion time histories will not be needed for structural design.

Project Location

We have used the approximate coordinates near the center of the bridge as the control point for the seismic hazard analysis. The coordinates of the approximate center of the bridge structure are:

Latitude: 32.9750° N Longitude: 117.2690° W

Material properties and other parameters used were selected to be representative of the response of the site as a whole to ground motions based on the preliminary field explorations performed at the project site.

Approach

This site response analysis was performed in general accordance with the requirements of the 2019 Caltrans SDC V2.0 and the AASHTO LRFD Bridge Design Specifications (BDS), 8th Edition, with California Amendments. The scope of this analysis includes the following:

- Review of subsurface conditions impacting the seismic hazards at the site including geology and subsurface stratigraphy and seismic hazards at the site;
- Development of a horizontal response spectrum at the base of the soil column which serves as the target spectrum in selection of ground motions to be used for the site response analysis. The target spectrum was developed for the 975-year return period ground motion level using an appropriate V_{S30} value in accordance with Caltrans SDC;
- Deaggregation analyses of the hazard to estimate the controlling seismic source(s) associated with the period ranges of interest for the target spectrum;
- Selection and modification of seven acceleration time histories per AASHTO LRFD BDS based on the target spectral shape, earthquake magnitude, distance, and frequency content from historical earthquake records;
- Spectral matching of the selected time histories to the developed target spectrum;

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- Development of soil properties to be used in the site response analysis;
- Site response analysis using appropriate equivalent linear and nonlinear models in accordance with Caltrans guidelines and the AASHTO LRFD BDS; and
- Development of the site-specific design acceleration response spectrum in accordance with the requirements of Caltrans guidelines and the AASHTO LRFD BDS.

The scope of this analysis is subject to the limitations provided in Section 6 of the main report.

SUBSURFACE CHARACTERIZATION

Subsurface characterization was developed to support the site response analysis and is based on the results of the current and previous subsurface investigations as discussed in Section 3 of the main report.

Subsurface Geology and Stratigraphy

The project site is generally underlain by an upper layer of Recent Alluvial Deposits (Qa) overlying successive strata of Young Alluvial Deposits (Qya), Young Estuarine Deposits (Qyes), Old Alluvial Deposits (Qoa), and the Del Mar Formation (Td). Further details regarding the characteristics and conditions of each of these geologic units are provided in Section 3 of the main report.

Based on the results of the geotechnical investigations performed at the site, a generalized best estimate profile of material properties was developed for use in the site response analysis and is presented below in Table F-1. These material properties were developed based on in-situ testing which included performing a Seismic Cone Penetrometer Test (SCPT), Cone Penetrometer Testing (CPTs), exploratory borings, and laboratory testing as well as our experience with similar materials in the project vicinity.

Table F-1

Material Properties for Site Response Analysis

Layer No.	Geologic Unit	Dominant Soil Type	Layer Thickness (ft)	Unit Weight (pcf)	Friction Angle (deg)	At-Rest Earth Pressure, Ko	Plasticity Index, PI
1	Qa	Sand (Loose)[1]	12	120	28	0.53	0
2		Clay (Soft)	7	110	18	0.69	40
3		Sand (Loose)[1]	16	120	28	0.53	0

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Table F-1 (Continued)

Material Properties for Site Response Analysis

Layer No.	Geologic Unit	Dominant Soil Type	Layer Thickness (ft)	Unit Weight (pcf)	Friction Angle (deg)	At-Rest Earth Pressure, Ko	Plasticity Index, PI
4	Qya	Sand (Med. Dense)[1]	30	125	32	0.47	1
5	Qyes	Clay (Stiff)	16	115	22	0.63	30
6	Qoa	Sand (Med. Dense to Dense)	55	125	34	0.44	1
7	Qoa/Td	Gravelly Sand (Very Dense) and Claystone / Sandstone (Very Dense / Very Stiff)	Half Space	135	-	-	-

Notes:
[1]Potentially liquefiable layers based on results of field investigation and liquefaction triggering analyses as presented in Section 4.1.2 of the main report.
[2]Material parameters and layering selected to represent best estimate for seismic site response and may not be appropriate for other geotechnical evaluations.

Site Class

Due to the potential of extensive liquefaction in the recent and young alluvial deposits at the site as discussed in Section 4.1.2 of this report, the site is classified as a Soil Profile Type F site and site response analysis is required per the SDC.

However, for the purpose of comparing the design spectrum with general response spectrum per AASHTO, site class was evaluated in accordance with the requirements of the Caltrans SDC V2.0 and the AASHTO LRFD BDS, 8th Edition, with California Amendments (Caltrans, 2019). The average shear wave velocity in the upper 100 feet (e.g. V_{S30}) was evaluated using data from the SCPT performed at the CPT-20-003 location. The results of the SCPT are provided on Figure F-1 and further details are provided in Appendix B of this report.

Using the SCPT data, the average shear wave velocity in the upper 100 feet was estimated to be of 711 ft/s (216 m/s), which is consistent with a Soil Profile Type D site classification per Caltrans SDC.

DEVELOPMENT OF BASE GROUND MOTIONS

Development of base ground motions include developing target response spectrum at the base of the soil column and then selecting and developing spectrally matched time histories to be used

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for performing site response analysis. Details of the target spectrum and time history development are discussed in the subsequent sections.

Target Spectrum Development

The target acceleration response spectrum at the base of the soil column was obtained from the Caltrans ARS Online V3.0.1 tool. The Caltrans ARS Online tool provides the probabilistic design response spectrum based on the United States Geological Survey (USGS) 2014 National Seismic Hazard Maps for a 975-year return period (Petersen et al., 2014). Inputs for the ARS Online tool include the site's coordinates, in which we used the site's coordinates for the approximate center of the bridge, as well as the V_{S30} value. For the target spectrum, a V_{S30} value consistent with soil conditions at the base of the soil column was used. In general, where bedrock is shallow, base of the soil column is located at the bedrock. However, for this site, bedrock is relatively deep, therefore, we have selected our base at a certain depth beyond which the shear wave velocity is quite consistent and reflective of competent materials. Based on this, for our site response analysis, the base of the soil column is located at a depth of approximately 136 feet from the ground surface within the river channel, or at an approximate elevation of -134 ft NAVD88. Based on shear wave velocity values obtained at that elevation in the SCPT performed at the site, a V_{S30} value of 1,000 ft/s (315 m/s) was used for development of the target spectrum.

The target response spectrum for a 975-year return period, using a V_{S30} value of 1,000 ft/s, obtained from the Caltrans ARS Online tool is provided in Table F-2 and Figure F-2. This target spectrum was adjusted for near fault amplification based on the proximity of the site to the controlling Rose Canyon fault in accordance with Caltrans SDC requirements.

Table F-2

Caltrans ARS Online Target Response Spectrum

Period	Near Fault Amplification Factor	Probabilistic Spectral Acceleration (g)
0.01 (PGA)	1	0.43
0.1	1	0.75
0.2	1	1.01
0.3	1	1.06
0.5	1	0.92
0.75	1.1	0.78

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Table F-2 (Continued)

Caltrans ARS Online Target Response Spectrum

Period	Near Fault Amplification Factor	Probabilistic Spectral Acceleration (g)
1.0	1.2	0.66
2.0	1.2	0.32
3.0	1.2	0.2
4.0	1.2	0.14
5.0	1.2	0.1

Time History Selection and Spectral Matching

Using the target response spectrum provided in Figure F-2 and Table F-2, a suite of seven time histories were selected from the PEER Strong Ground Motion Database (PEER, 2014) and spectrally matched for use in the site response analysis in accordance with AASHTO and Caltrans. The time histories were selected based on several criteria including near-fault pulse motions, scaling factor, site-to-source distance, magnitude, V_{S30}, arias intensity, duration, style of faulting, shape of response spectrum, etc. These time histories were selected and modified for use in site response analysis only and may not be appropriate for other applications.

Due to the site's close proximity to the Rose Canyon fault, both pulse and non-pulse motions were considered during selection of time histories as required by AASHTO guidelines. Based on the methodology presented in Hayden et al. (2014), the distance from the site to the Rose Canyon fault, and the epsilon value of the spectral acceleration at a period of 1 second, we estimated that the proportion of pulse motions to be selected for the site response analysis is three to four pulse motions out of seven, with the remainder being non-pulse motions.

Consideration was also given to the controlling earthquake sources over various period ranges considering the results of the USGS deaggregation of the probabilistic seismic hazard. Based on the deaggregation results, the shorter period (higher frequency) range of the target spectrum is controlled primarily by events associated with the near (less than 15 km away) to mid-field range such as the nearby Rose Canyon fault at approximately 2.2 miles (3.6 km) west of the site as well as the Oceanside fault and Coronado Bank fault at approximately 11 miles (17.7 km) and 16.5 miles (26.5 km) west of the site, respectively. Longer period ranges were also controlled by these near to mid-field events but also had contributions from farther events such as those associated with the Elsinore fault at 29.5 miles (47.4 km) east of the site and the San Jacinto fault

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at 54 miles (87 km) east of the site. The style of faulting associated with these controlling sources include strike-slip and reverse/oblique faulting. Based on these results, we evaluated a suite of ground motions considering primarily near to mid-field events for strike-slip and reverse/oblique sources in order to understand the range of responses likely to occur.

Other selection parameters included magnitude and V_{S30}, in which time histories relatively close to the probabilistic mean magnitude of 6.65 and V_{S30} value of 1,000 ft/s for the target spectrum were selected. Considerations for arias intensity and duration of the ground motions used the methodologies of Travasarou et al. (2003) and Bommer et al. (2009) for selection of ground motions in relation to these parameters.

Based on these criteria, a suite of seven time histories was selected from the PEER database that had a spectral shape after scaling (scaling factors less than 3) generally in good agreement with the target response spectrum. These selected ground motion time histories and their associated characteristics are provided in Table F-3.

Table F-3

Selected Time Histories from PEER Database

Record No.	Event Name	Year	M_w	Distance, R_{Rup} (km)	V_{S30} (m/s)	Faulting Mechanism	D_{5-95} (sec)	I_A (m/s)	LUF (Hz)	Pulse Period	Scaling Factor
RSN 725	Superstition Hills-02	1987	6.54	11.16	316.64	SS	13.7	2.1	0.1625	-	1.6
RSN 767	Loma Prieta	1989	6.93	12.82	349.85	RO	11.4	2.1	0.125	2.64	1.4
RSN 1045	Northridge-01	1994	6.69	5.48	285.93	R	8.8	1.5	0.125	2.98	1.2
RSN 1119	Kobe, Japan	1995	6.9	0.27	312	SS	4.6	3.9	0.1625	1.81	0.8
RSN 1605	Duzce, Turkey	1999	7.14	6.58	281.86	SS	11.1	2.9	0.1	5.94*	0.9
RSN 3756	Landers	1992	7.28	40.67	368.2	SS	32.9	1	0.05	-	2.9
RSN 6923	Darfield, NZ	2010	7	30.53	255	SS	20.1	1.6	0.2	-	1.6

Notes: Definitions: M_w – Moment Magnitude; R - Reverse fault; RO – Reverse Oblique fault; SS – Strike-slip fault; D_{5-95} – Significant Duration; I_A – Arias Intensity; LUF – Lowest Usable Frequency
*Pulse motion as defined by Shahi and Baker (2014). This time history is not identified as a pulse motion in the PEER database.

The selected ground motions from the PEER database were then modified by performing spectral matching using the RSPMatch program developed by Atik and Abrahamson (2010) as implemented in the computer program EZ-FRISK™ (Risk Engineering, 2018) which generally implements the spectral matching algorithm proposed by Lilhanand and Tseng (1987, 1988) with an updated wavelet adjustment to preserve the non-stationary characteristics of the ground motions. Spectral matching was completed such that the resulting spectrum was generally in good

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agreement with the target spectrum particularly over the period range of interest. The spectrally matched ground motions were compared with the PEER database original ground motions to ensure that the matching process retained the non-stationary characteristics of the record.

Figures presenting the selected matched time histories used as the “outcrop” ground motions in the site response analysis, along with the original time histories as obtained from the PEER database, are provided on Figures F-3 through F-9. The matched spectra and average of the matched spectra compared to the target spectrum is shown on Figure F-10.

SITE RESPONSE ANALYSIS

Site response analysis was completed for the site in accordance with the 2019 Caltrans SDC V2.0 and the AASHTO LRFD BDS, 8th Edition, with California Amendments. Evaluations were completed using the selected, matched time histories as the outcrop motions in conjunction with one-dimensional total stress nonlinear (without porewater pressure generation) and equivalent linear response history analyses using the computer program DEEPSOIL v7.0 (Hashash et al., 2020). Results of the site response analysis were used to develop the site-specific design acceleration response spectrum for the project. Details of the site response analysis methodology and results are presented in the subsequent sections.

Representative Soil Profile and Analysis Approach

For the site response analysis, the material properties and generalized soil layering discussed previously were adopted with soil parameters assigned as shown in Table F-4. The various soil layers were fit to the appropriate modulus reduction and damping curves as shown in Table F-4. In fitting the modulus reduction and damping curves, the general quadratic / hyperbolic (GQ/H) strength controlled constitutive model of Groholski et al. (2015) was used as this model is able to account for the small strain behavior and shear strength of the soil. The soil layers were subdivided into sub-layers to allow for higher maximum frequencies to pass through the layers. The number and thickness of the sub-layers are also provided in Table F-4. It should be noted that generation of excess pore pressures for the potentially liquefiable soils at the site were not considered in the site response analysis in accordance with guidance provided in communications with Caltrans. In addition, shear strengths in potentially liquefiable materials were not reduced for site response analysis.

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Table F-4

GQ/H Model Soil Parameters for Site Response Analysis

Layer No.	Geologic Unit	Dominant Soil Type	Modulus Reduction / Damping[1]	Layer Thickness (ft)	No. of Sub Layers (Thickness)	Maximum Freq. Passing (Hz)	Vs (fps)
1	Qa	Sand (Loose)[1]	Darendeli (2001)	12	6 (2 ft)	81.3	650
2		Clay (Soft)	Darendeli (2001)	7	2 (3.5 ft)	42.9	600
3		Sand (Loose)[1]	Darendeli (2001)	16	8 (2 ft)	81.3	650
4	Qya	Sand (Med. Dense)[1]	Darendeli (2001)	30	10 (3 ft)	62.5	750
5	Qyes	Clay (Stiff)	Darendeli (2001)	16	4 (4 ft)	43.8	700
6	Qoa	Sand (Med. Dense)	Darendeli (2001)	55	11 (5 ft)	42.5	850
7	Qoa/Td	Gravelly Sand (Very Dense) and Claystone / Sandstone (Very Dense / Very Stiff)	Half Space				1,000

Notes:
[1]Potentially liquefiable layers based on results of field investigation and liquefaction triggering analyses as presented in Section 4.1.2 of the main report.
[2]Modulus Reduction and Damping curves used in fitting of model parameters. Shear strengths for fitting routine taken using cohesion and friction angles shown previously.

The GQ/H model uses shear strength which varies with depth to model large-strain behavior of the soil. The shear strength used in the GQ/H model is the judgement-based shear strength developed at 0.1 percent shear strain for a linear elastic material with 80 percent of the maximum shear modulus derived from the shear wave velocity of the soil layer as defined in Hashash et al. (2020). Viscous small strain damping used a frequency independent formulation implemented in DEEPSOIL as recommended by Hashash et al. (2020). The selected ground motions were modeled as “outcrop” motions at the base of the soil profile.

Evaluation and Results

The profile response with depth and the response spectra at the modeled ground surface were obtained from the site response analysis for each of the selected ground motions as shown on Figures F-11 through F-19 and the averages of the non-linear and equivalent linear responses are provided on Figure F-20. In general, the equivalent linear site response analysis resulted in deamplification of the “outcrop” ground motions at the surface at short periods (generally less than periods of approximately 0.4s to 0.6s) and amplification at the surface at longer periods. The non-linear site response analysis also resulted in deamplification at shorter periods with

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amplification of the “outcrop” ground motions at the ground surface at periods greater than about 0.7s to 0.9s. When comparing the average equivalent linear and non-linear results of the selected ground motions to the target spectrum, deamplification was observed at periods up to approximately 0.4s and 0.9s, respectively, with amplification at periods thereafter (up to 5 seconds for the site response analysis).

The maximum spectral acceleration values of the non-linear and equivalent linear site response results were used to develop an enveloping spectrum in order to evaluate the amplification of the target spectrum expected at the site. As shown on Figure F-21, the average equivalent linear spectrum controls for periods up to approximately 2 seconds and the average non-linear spectrum controls thereafter. This enveloping spectrum was compared to the average of the “outcrop” ground motions to develop amplification factors (i.e. ratio of enveloping spectral accelerations to “outcrop” spectral accelerations). The amplification factors are also provided on Figure F-21.

Using the amplification factors shown in Figure F-21, the recommended design acceleration response spectrum was developed by multiplying the base target spectrum by the amplification factors at each period consistent with the requirements of AASHTO LRFD BDS. This amplified spectrum was then compared with two-thirds of the general procedure spectrum developed in accordance with AASHTO LRFD BDS as the final recommended design response spectrum should not be less than the two-thirds of the general procedure spectrum. The general procedure response spectrum was developed using the values of peak ground acceleration (PGA), the short-period spectral acceleration coefficient (S_s), and the long-period spectral acceleration coefficient (S_1) obtained from the USGS National Seismic Hazard Maps for a 975-year return period as presented in Section 3.10.2.1 of the AASHTO LRFD BDS. These spectral accelerations were site corrected using the Site Class D site factors referenced from Section 3.10.3.2 of the AASHTO LRFD BDS and the site-corrected spectral accelerations were used to develop the general procedure spectrum is accordance with Section 3.10.4.1 of the AASHTO LRFD BDS.

As shown on Figure F-22, the amplified target spectrum controls for all periods in our analysis except for periods between approximately 0.03 and 0.3 seconds in which the two-thirds of the general procedure spectrum controls. Therefore, the final recommended design acceleration response spectrum is an enveloping spectrum of the amplified target spectrum and the two-thirds of the general procedure spectrum. This recommended design acceleration response spectrum and the associated spectral displacement values are provided in Table F-5 and shown on Figure F-23.

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Table F-5
Site-Specific Horizontal 5% Damped
Recommended Design Spectral Acceleration and
Spectral Displacement Values

Period, T (seconds)	Design Acceleration Spectrum, S_a (g)	Design Displacement Spectrum, S_D (in)
0.010	0.379	0.00
0.020	0.394	0.00
0.030	0.409	0.00
0.050	0.482	0.01
0.075	0.574	0.03
0.1	0.665	0.07
0.113	0.714	0.09
0.2	0.714	0.28
0.28	0.714	0.55
0.3	0.766	0.67
0.5	0.964	2.36
0.75	0.888	4.89
1.0	0.957	9.37
2.0	0.502	19.67
3.0	0.282	24.85
4.0	0.172	26.99
5.0	0.118	28.86

LIMITATIONS

The values in this appendix were developed using site response analysis as required by Caltrans SDC V2.0 and supersede any seismic design parameters provided previously. The results are subject to the limitations in Section 6 of this Preliminary Foundation Report and rely upon the results of the field investigation as presented in this report.

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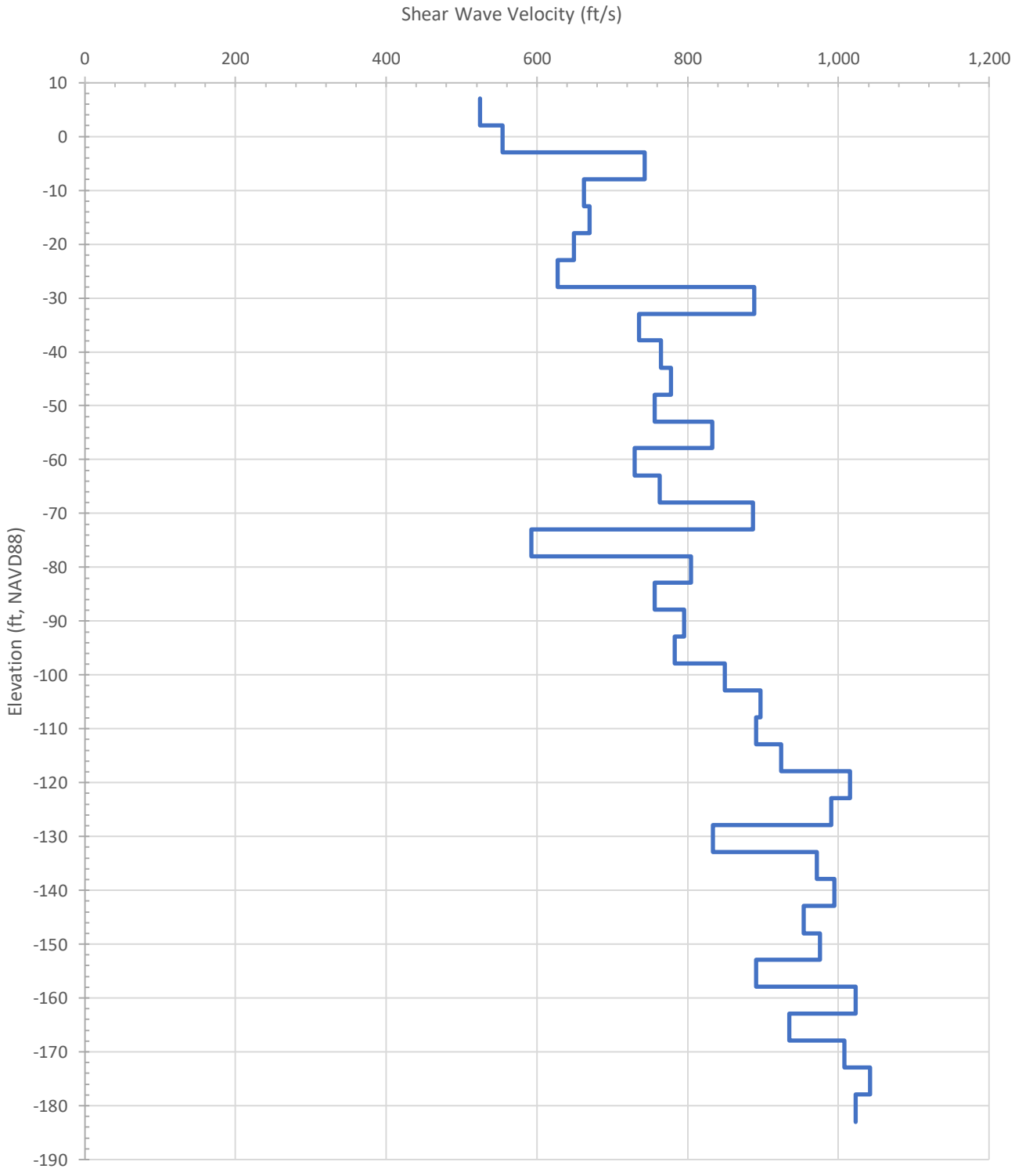
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SCPT Shear Wave Velocity Results



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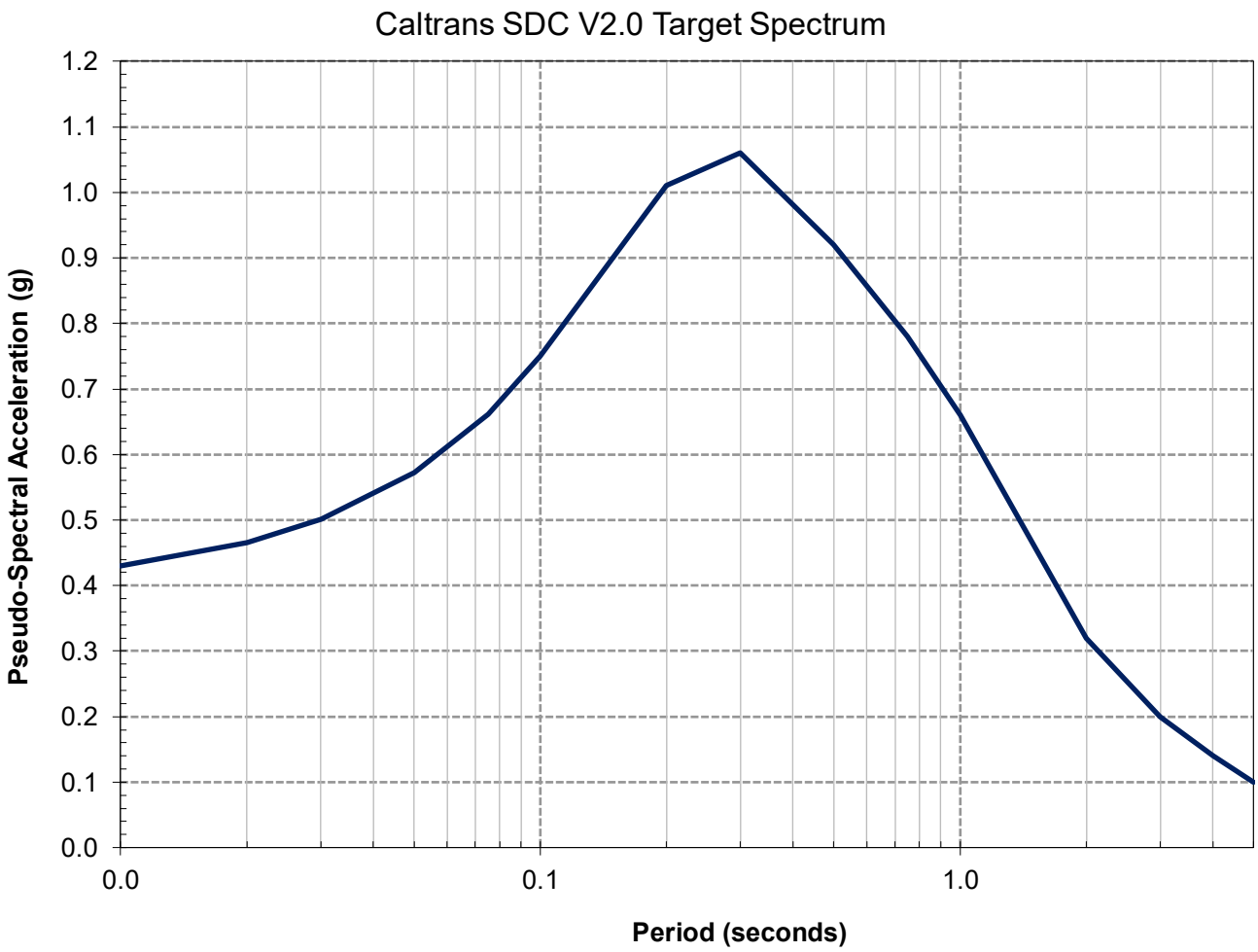
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	SCPT.ppt

SCPT SHEAR WAVE VELOCITY RESULTS

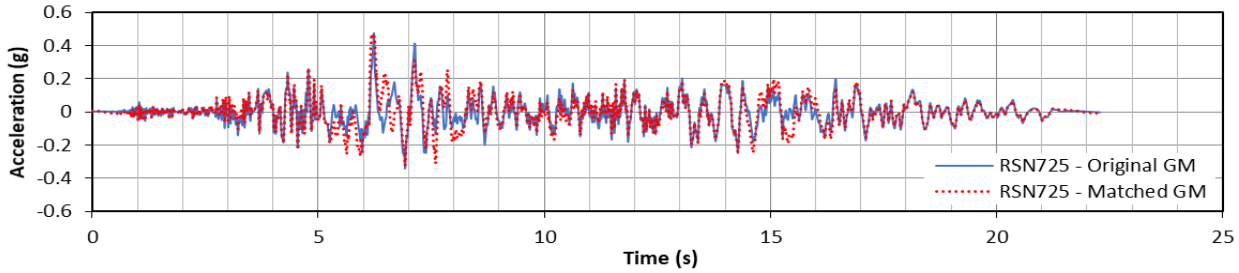
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

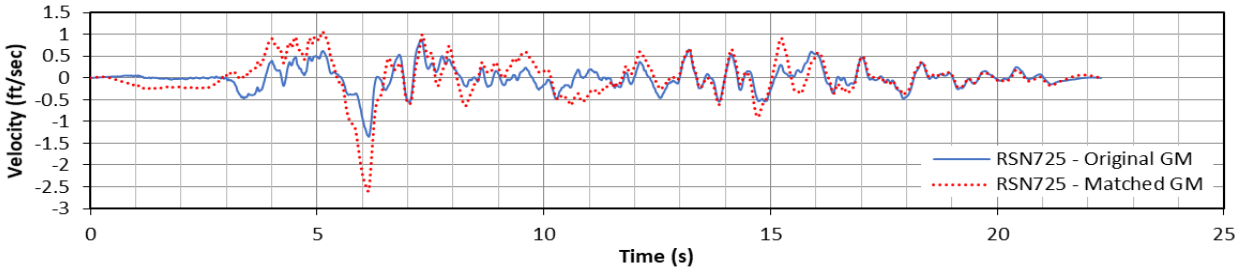
FIGURE

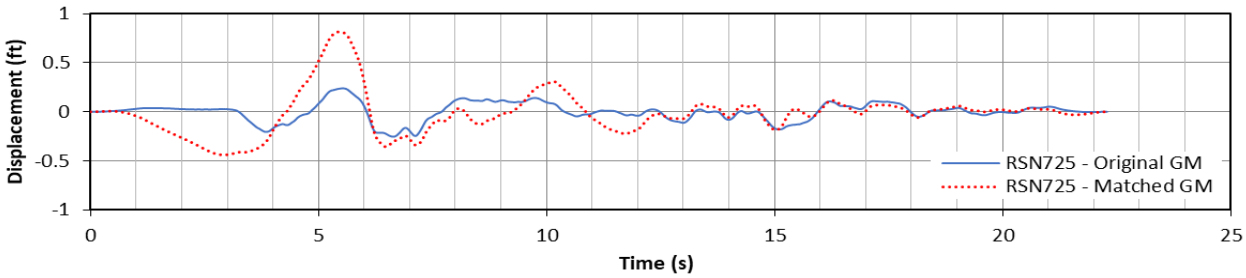
F-1

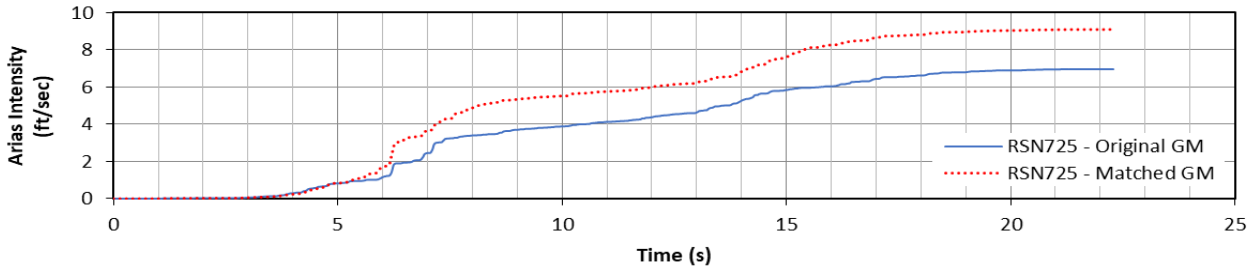


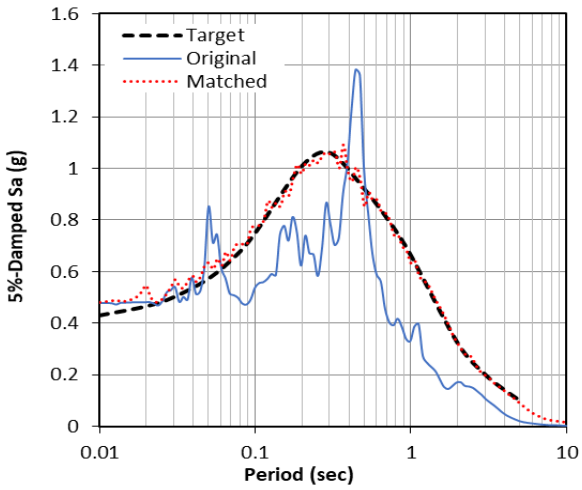
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	DATE: 06/2020		
	DRAWN: JLB		
	CHECKED BY: ZZ	CAMINO DEL MAR BRIDGE REPLACEMENT OVER SAN DIEGUITO RIVER - PHASE 0 DEL MAR, CALIFORNIA	
	File Name: TargetSpectrum.ppt		

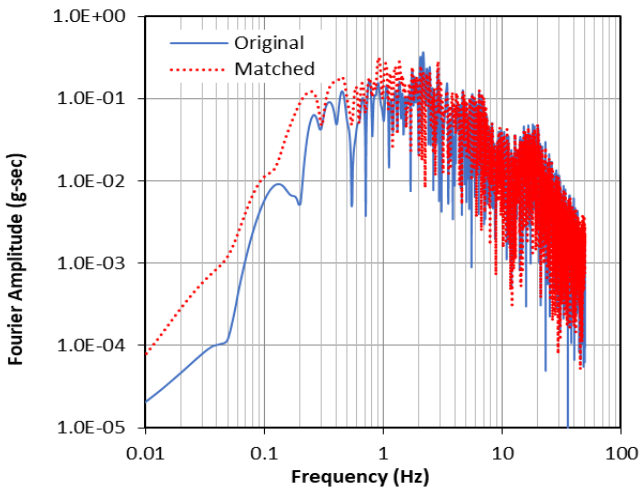












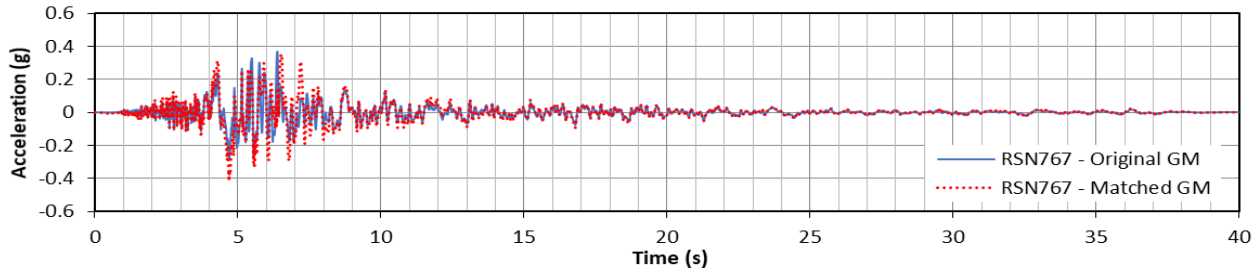
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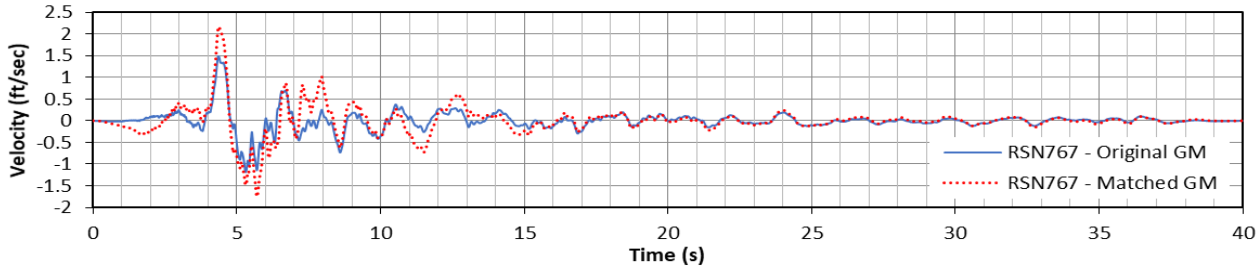
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM1 Plots.ppt

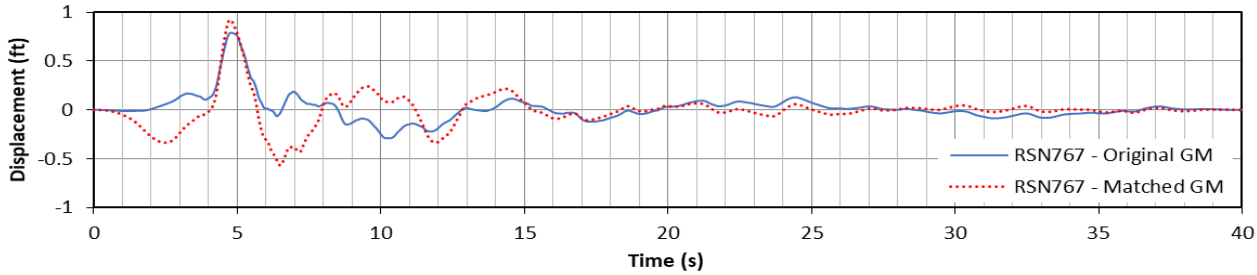
SPECTRAL MATCHING RESULTS
RSN No. 725 (270°)
SUPERSTITION HILLS 1987

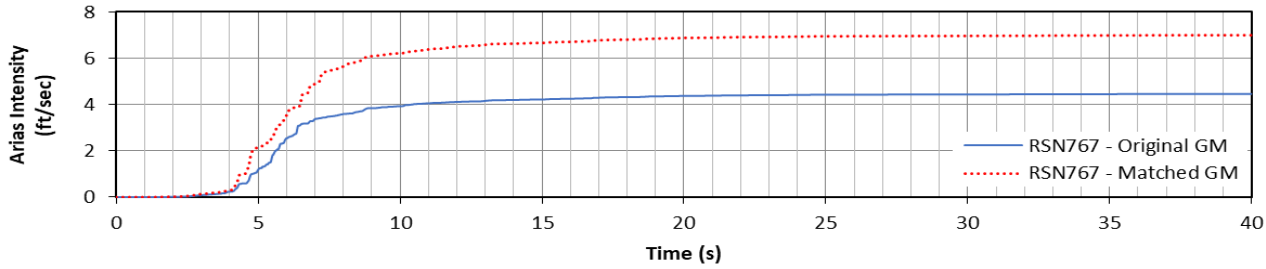
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

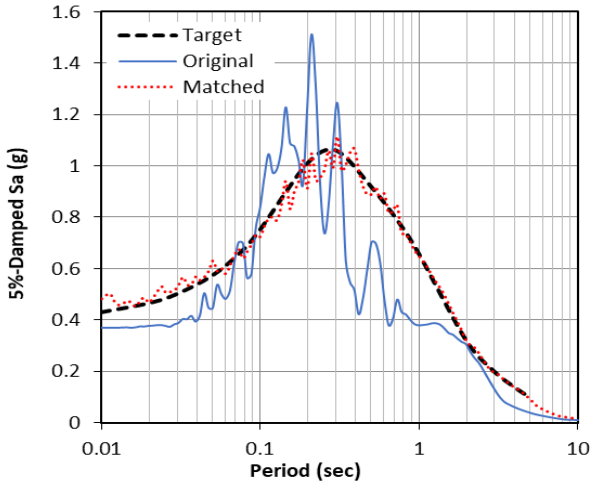
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F-3

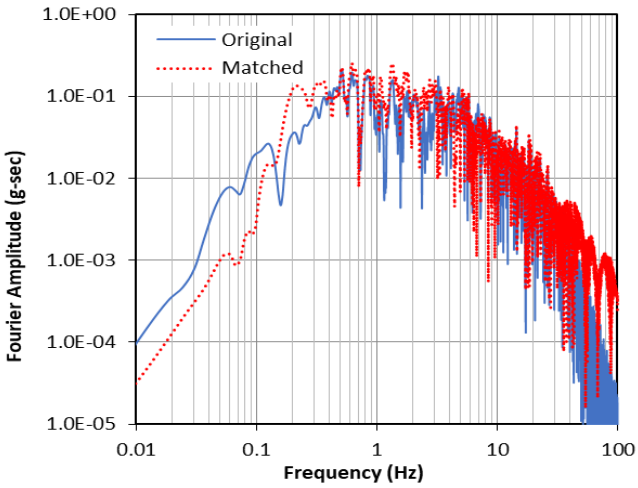












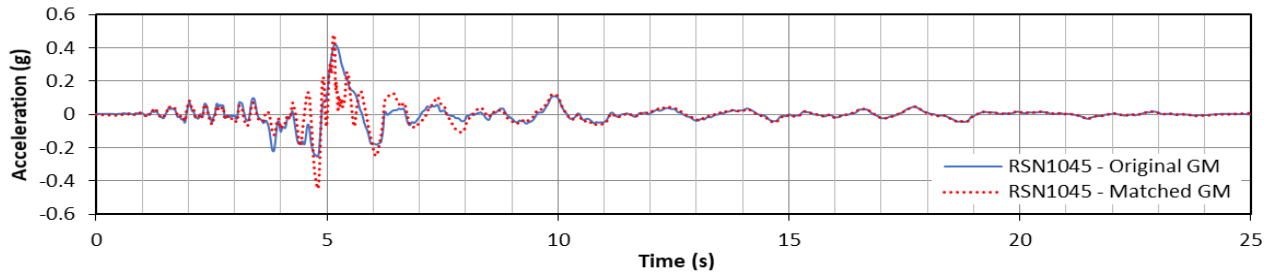
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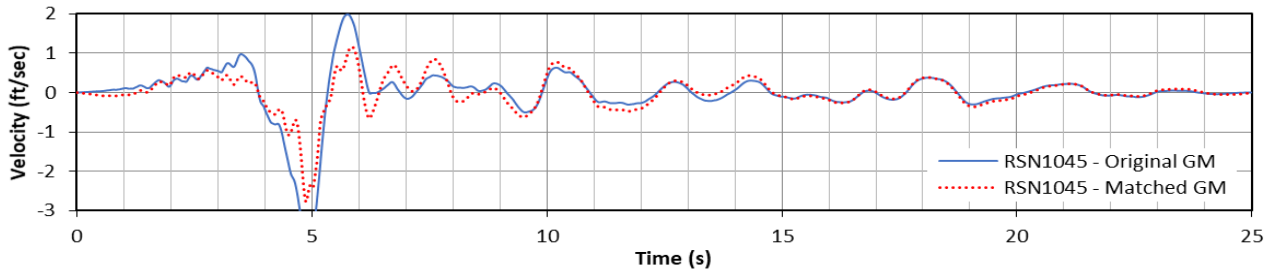
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM2 Plots.ppt

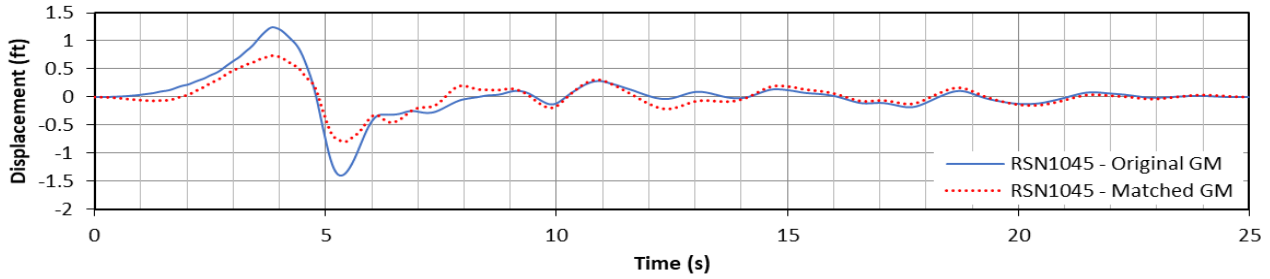
SPECTRAL MATCHING RESULTS
RSN No. 767 (90º)
LOMA PRIETA 1989

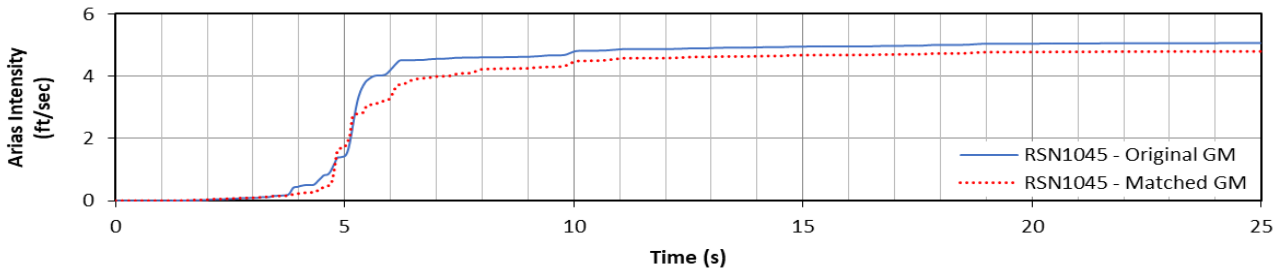
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

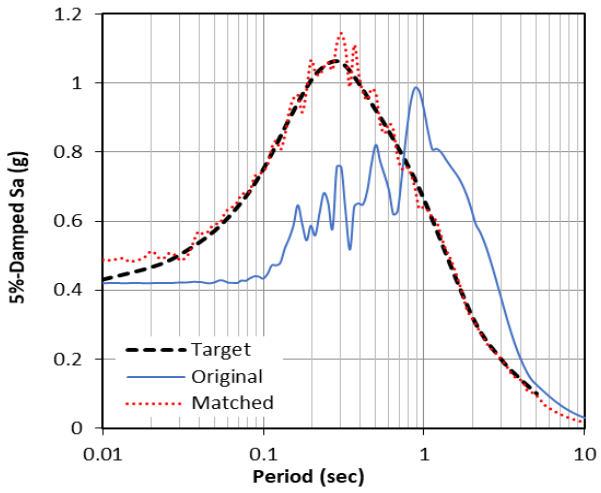
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F-4

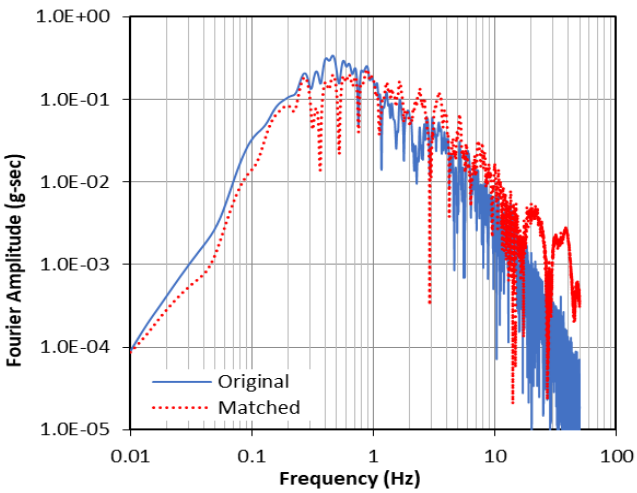












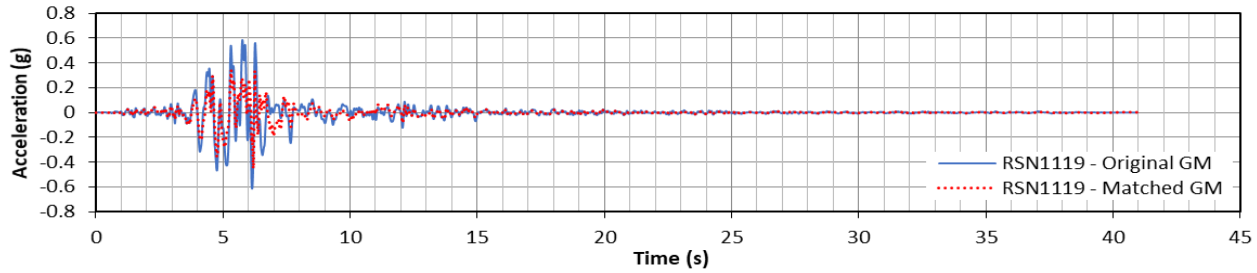
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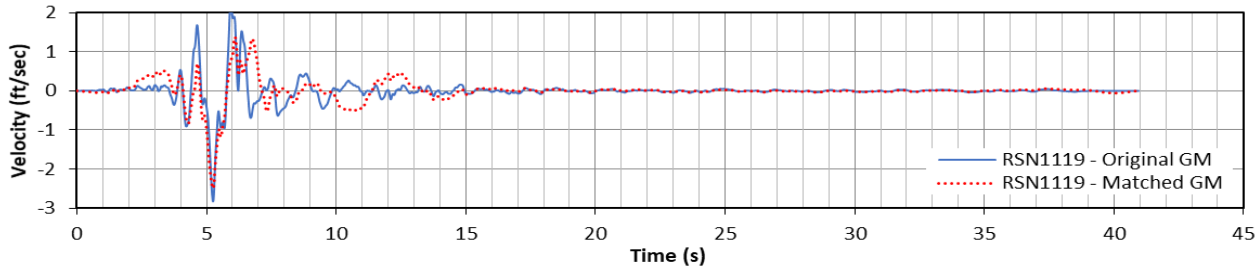
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DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM3 Plots.ppt

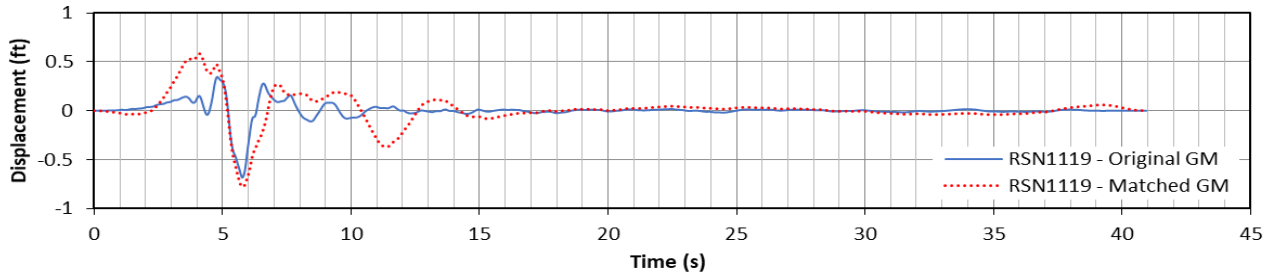
SPECTRAL MATCHING RESULTS
RSN No. 1045 (46°)
NORTHRIDGE 1994

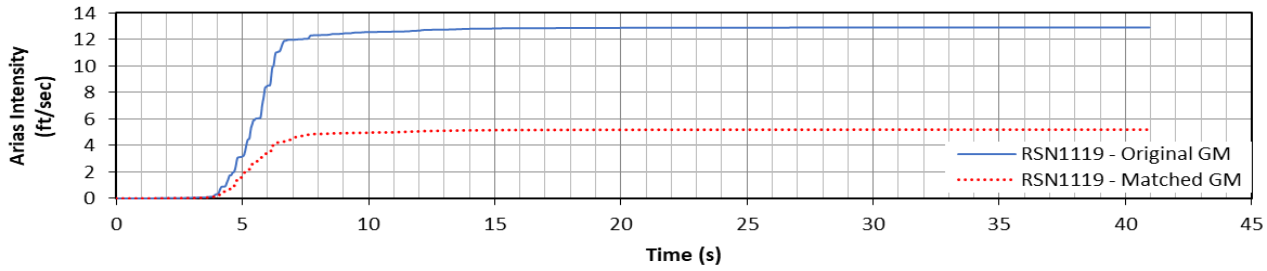
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

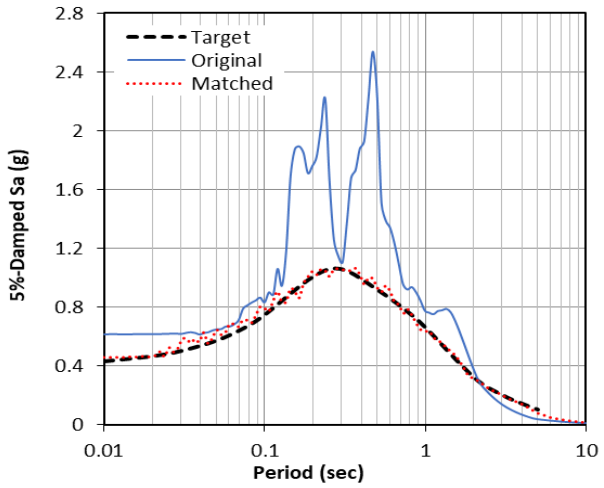
FIGURE
F-5

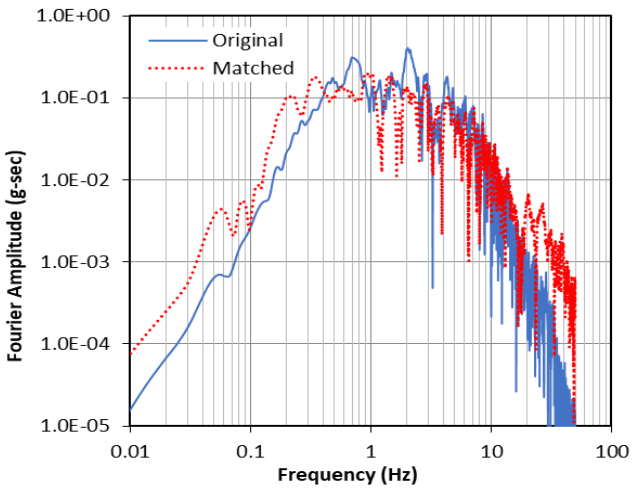












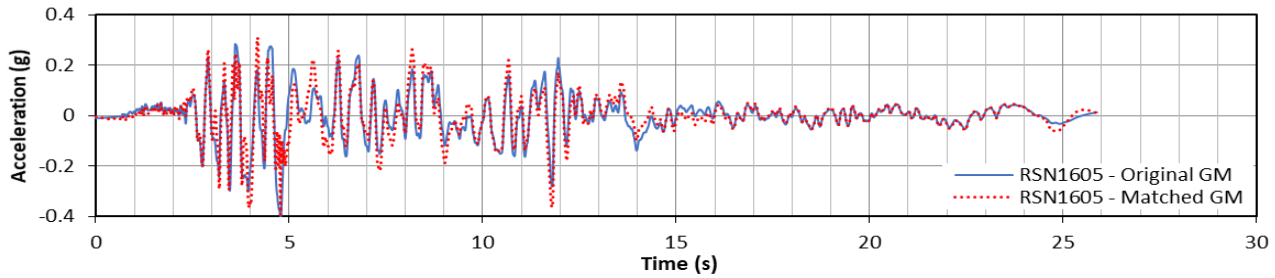
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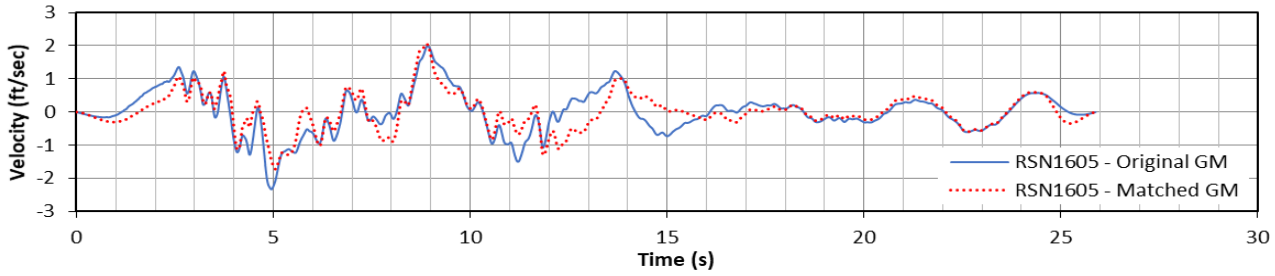
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM4 Plots.ppt

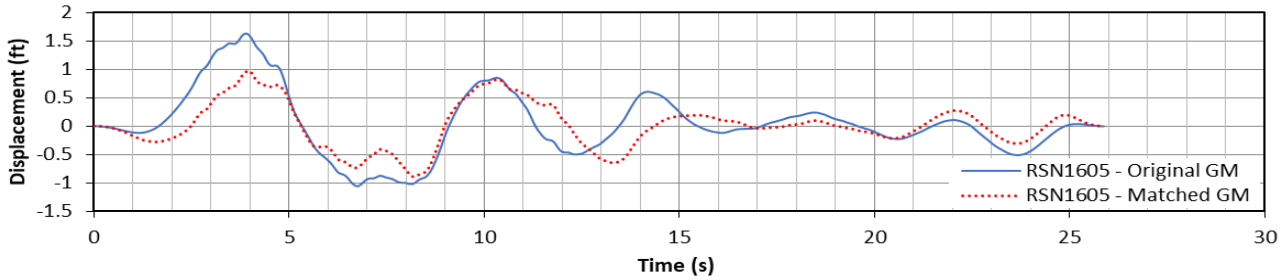
SPECTRAL MATCHING RESULTS
RSN No. 1119 (90º)
KOBE, JAPAN 1995

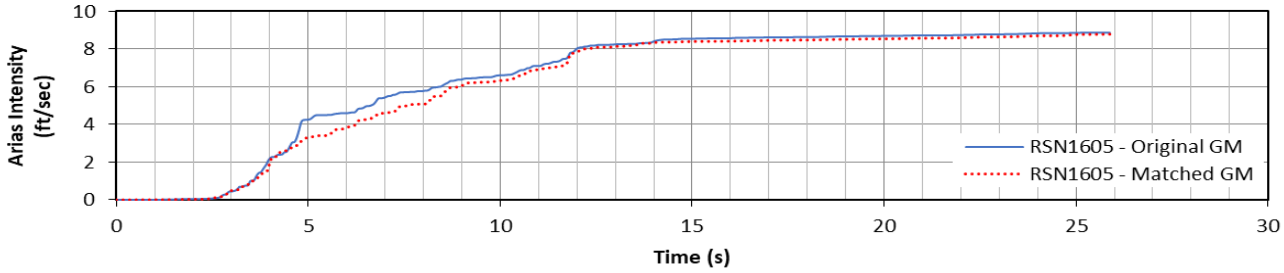
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

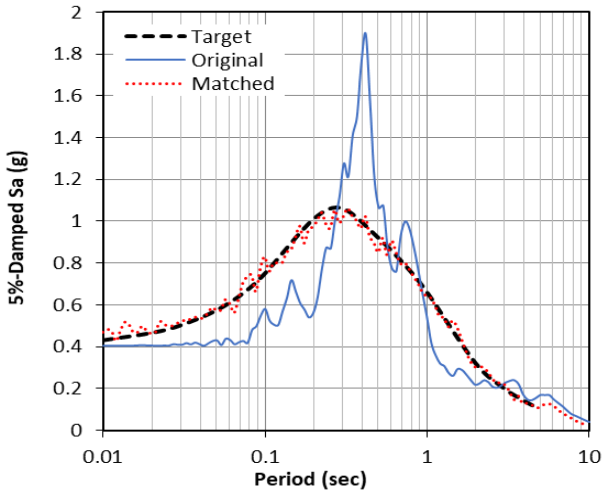
FIGURE
F-6

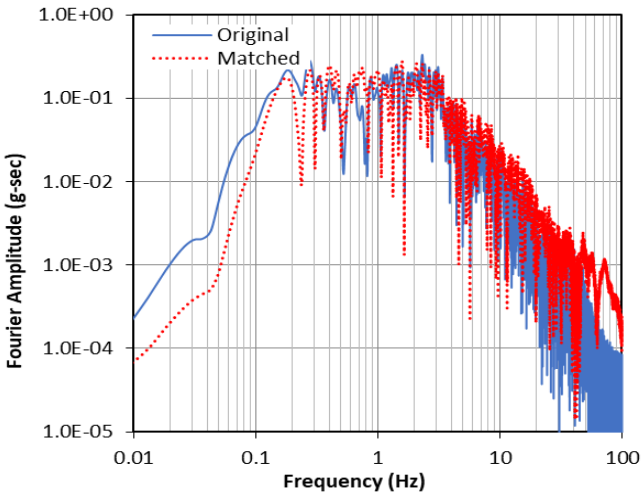












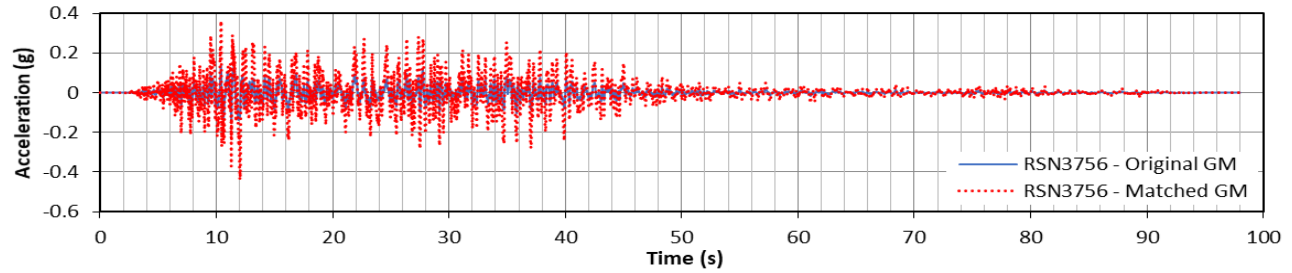
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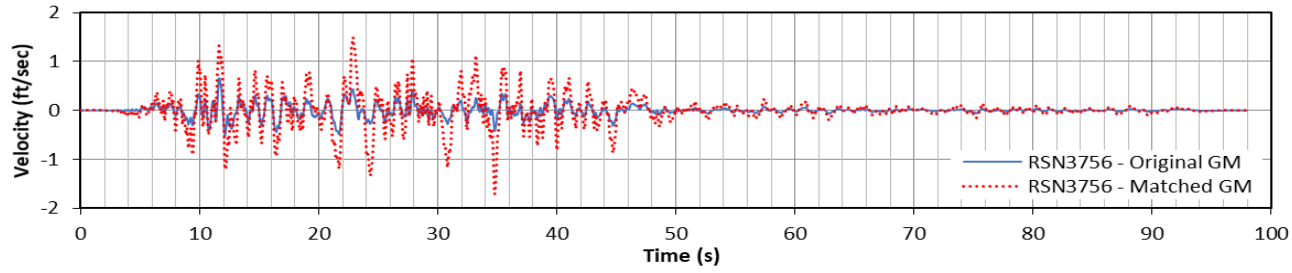
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DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM5 Plots.ppt

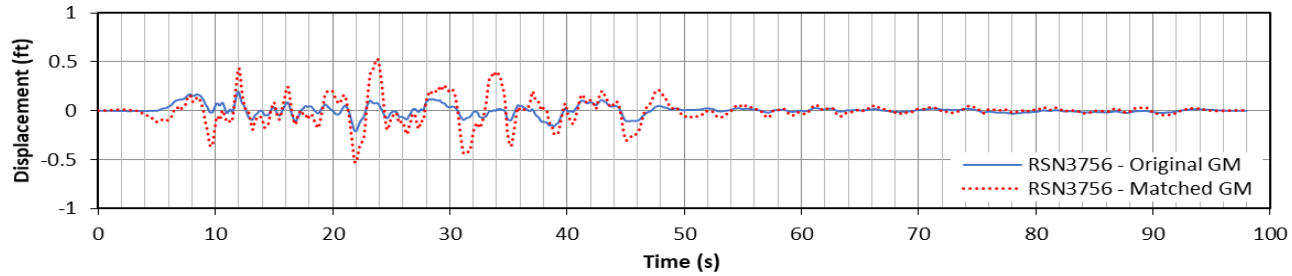
SPECTRAL MATCHING RESULTS
RSN No. 1605 (180°)
DUZCE, TURKEY 1999

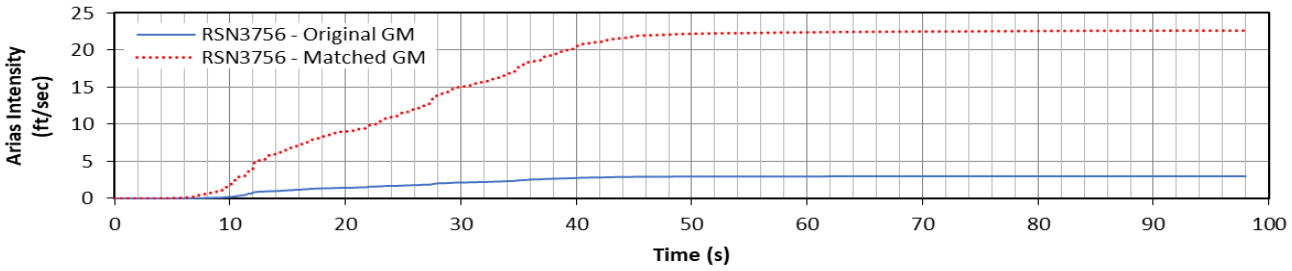
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

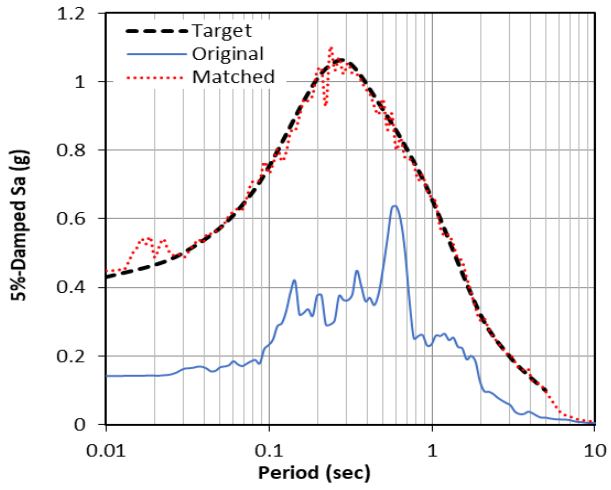
FIGURE
F-7

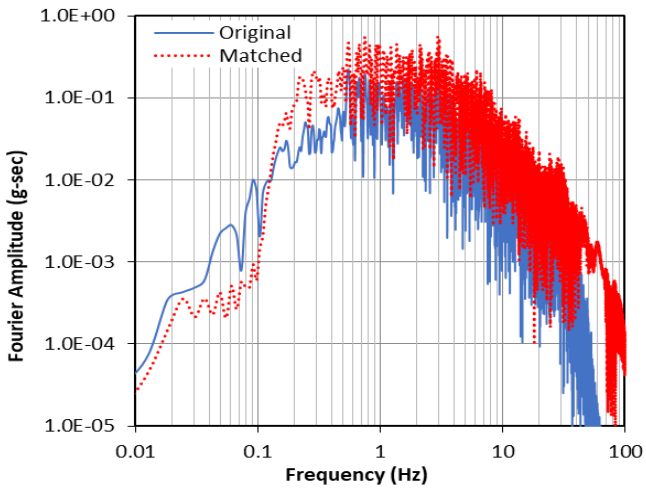












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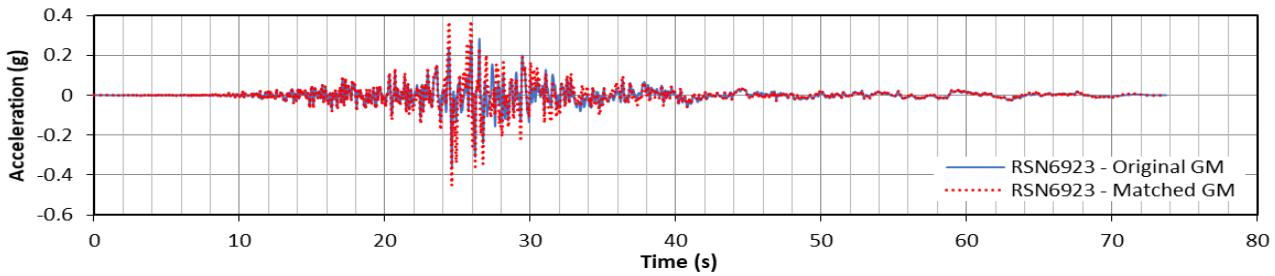
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM6 Plots.ppt

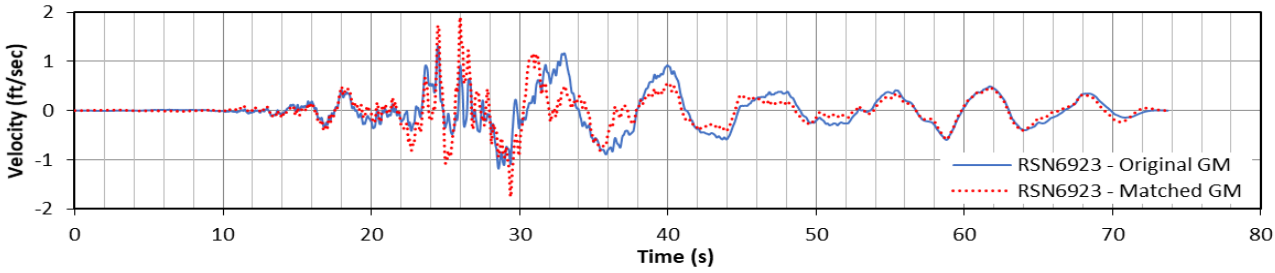
SPECTRAL MATCHING RESULTS
RSN No. 3756 (90°)
LANDERS 1992

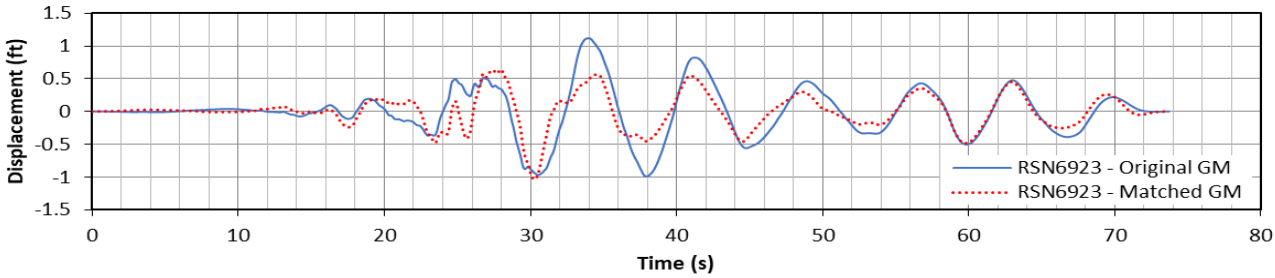
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

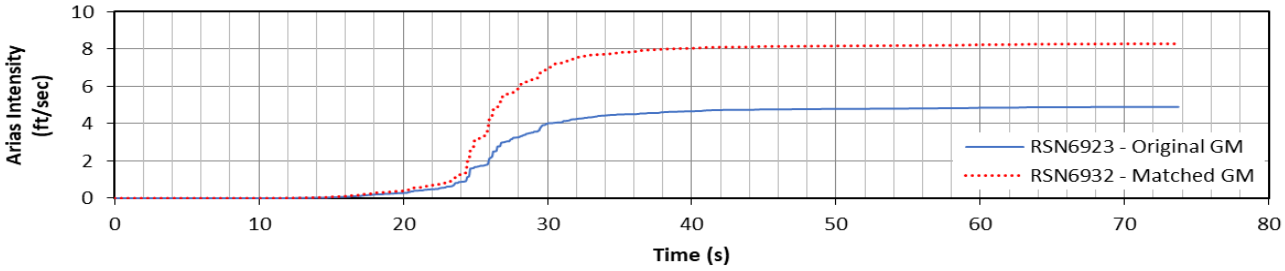
FIGURE

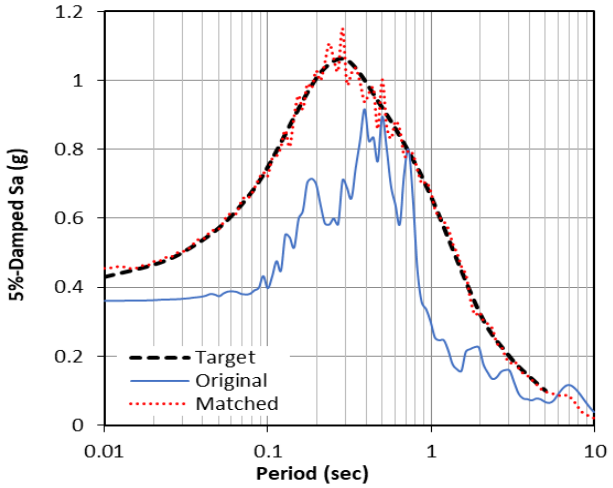
F-8

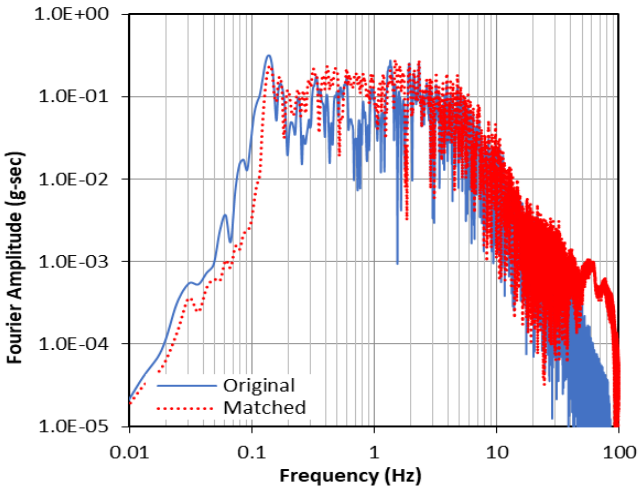












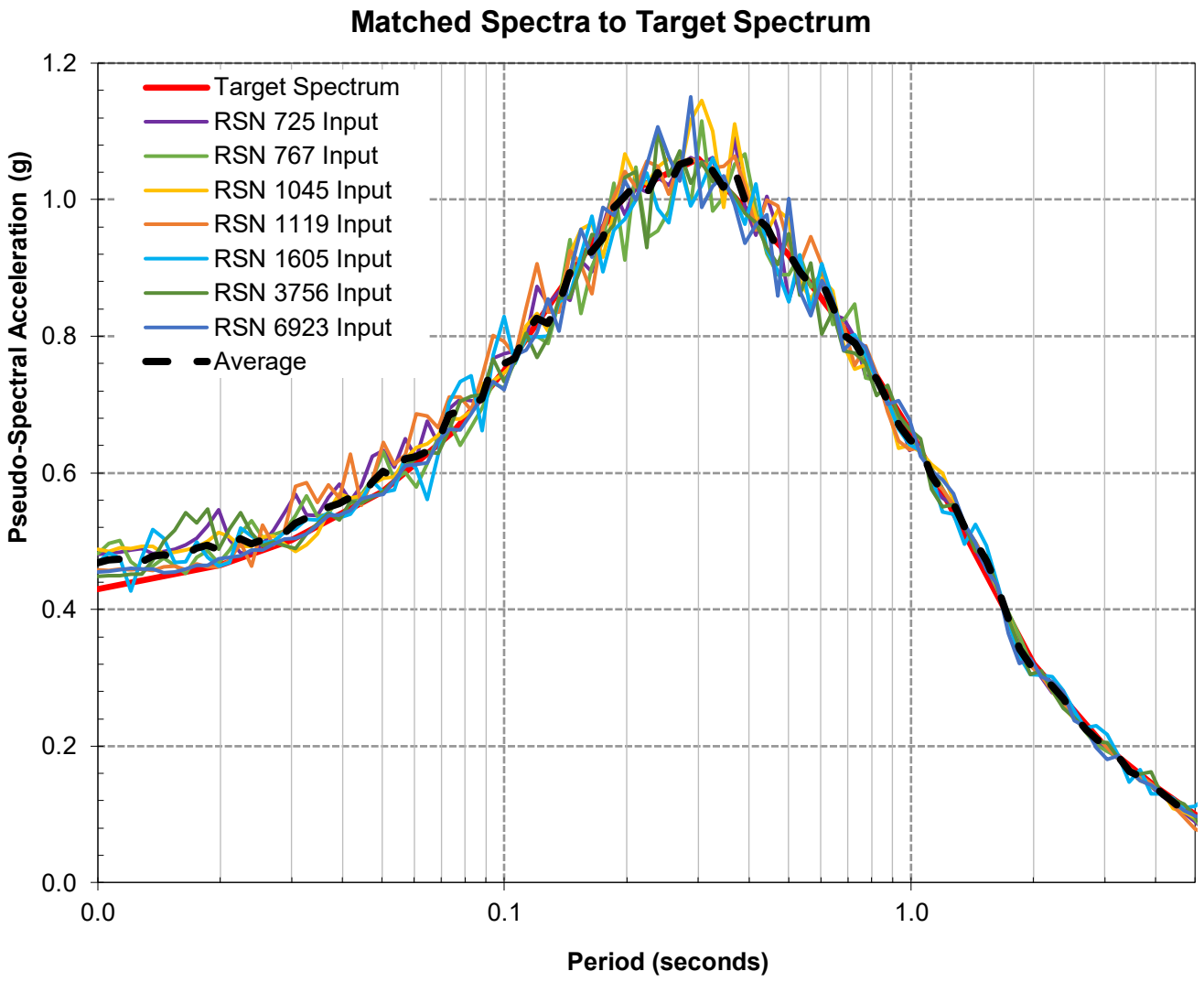
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PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM7 Plots.ppt

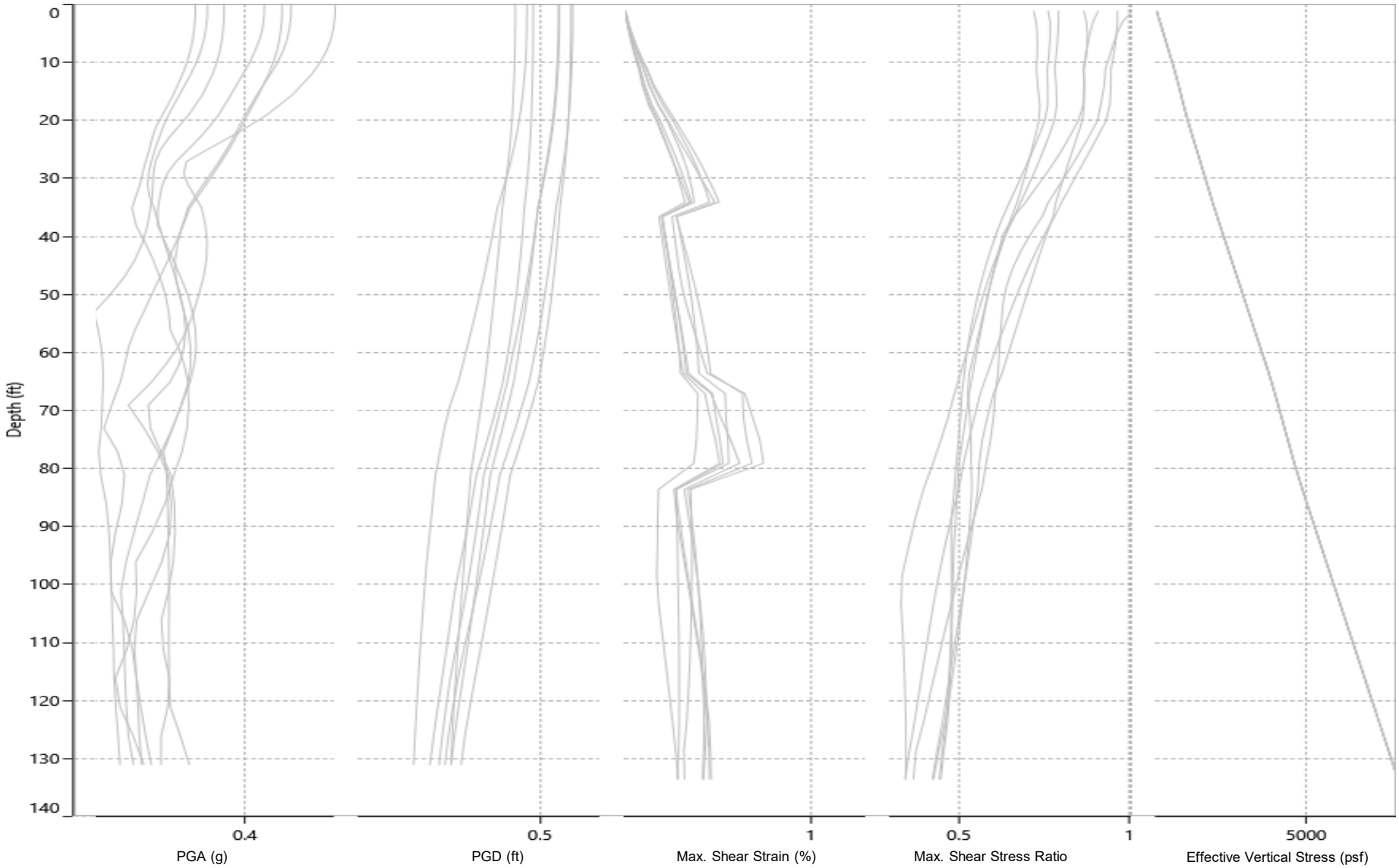
SPECTRAL MATCHING RESULTS
RSN No. 6923 (N15E)
DARFIELD, NEW ZEALAND 2010

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE
F-9



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	DATE: 06/2020		
	DRAWN: JLB		
	CHECKED BY: ZZ	CAMINO DEL MAR BRIDGE REPLACEMENT OVER SAN DIEGUITO RIVER - PHASE 0 DEL MAR, CALIFORNIA	
	File Name: InputSpectra.ppt		



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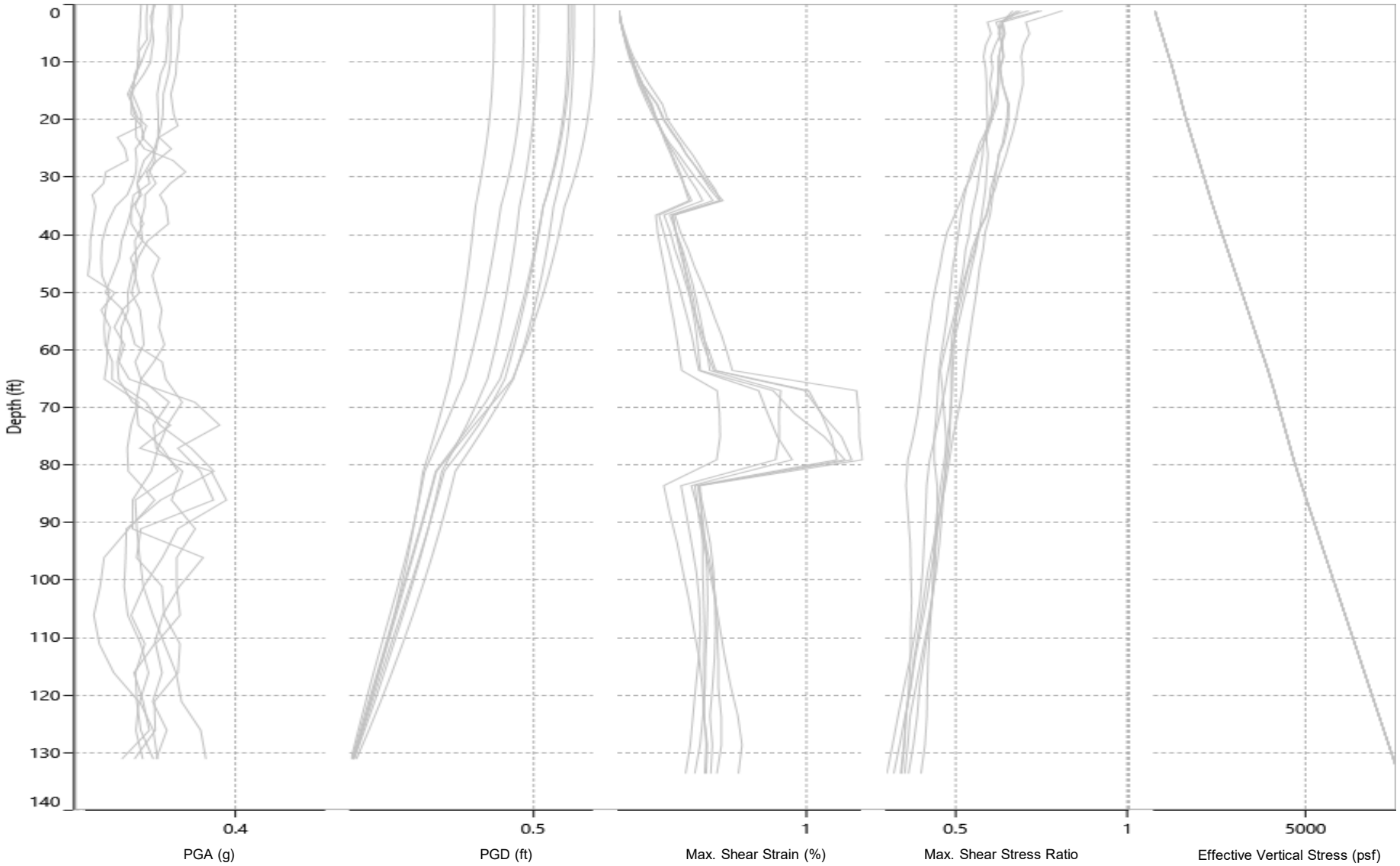
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	Results Prof Plots.ppt

EQUIVALENT LINEAR SITE RESPONSE RESULTS VS DEPTH GM1 TO GM7

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER – PHASE 0
DEL MAR, CALIFORNIA

FIGURE

F-11



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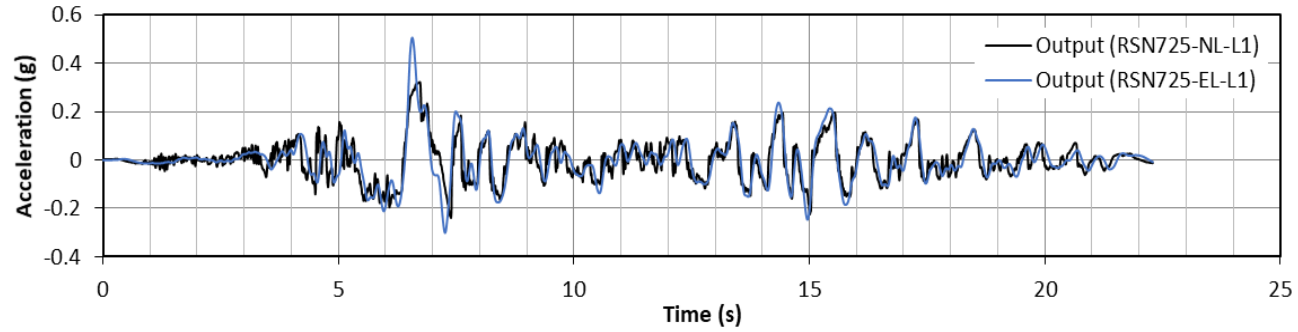
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	Results Prof Plots.ppt

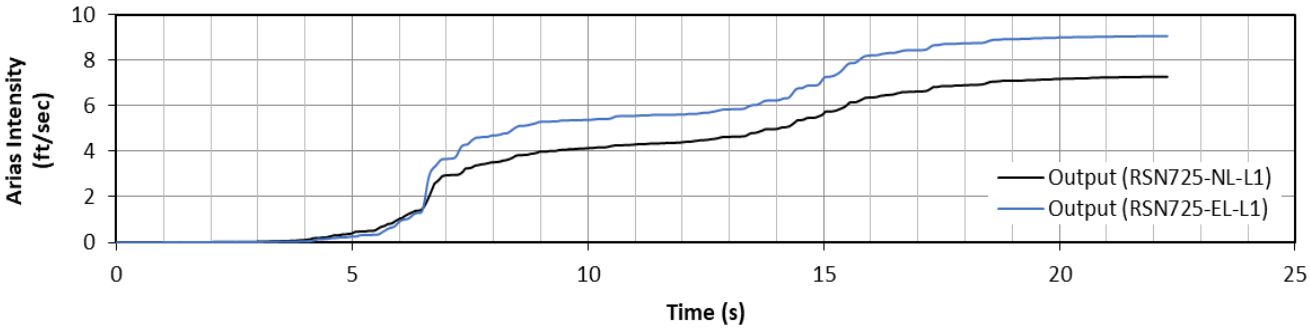
NON-LINEAR SITE RESPONSE RESULTS VS DEPTH GM1 TO GM7

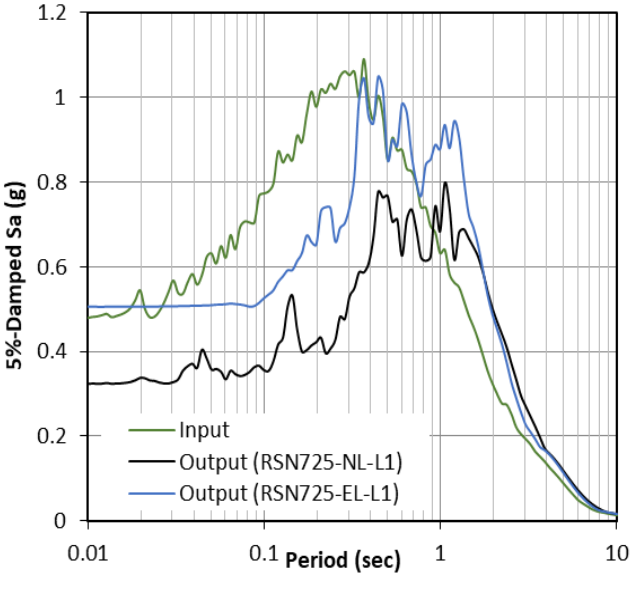
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER – PHASE 0
DEL MAR, CALIFORNIA

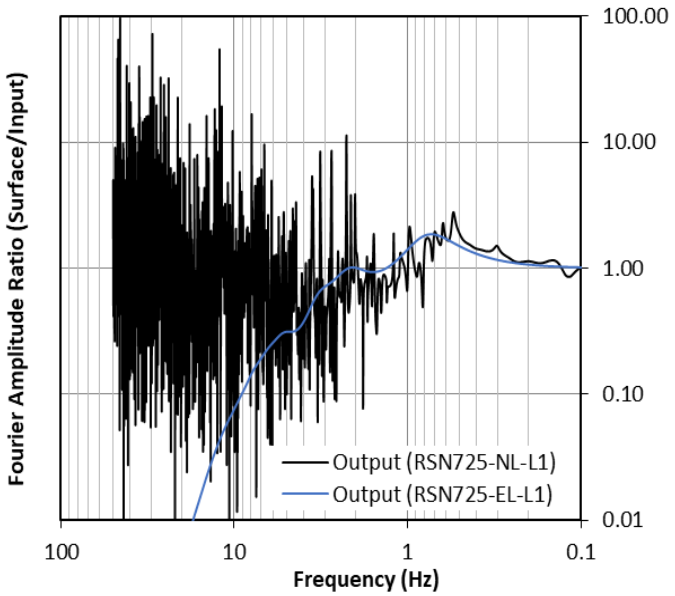
FIGURE

F-12



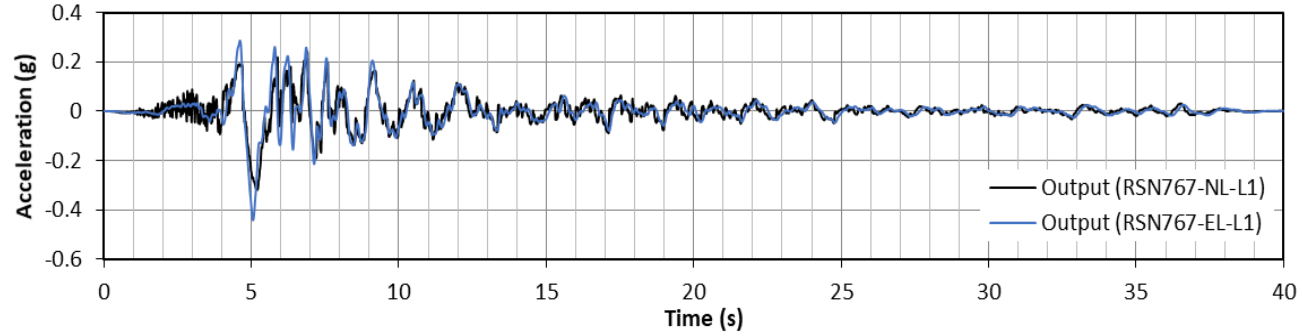


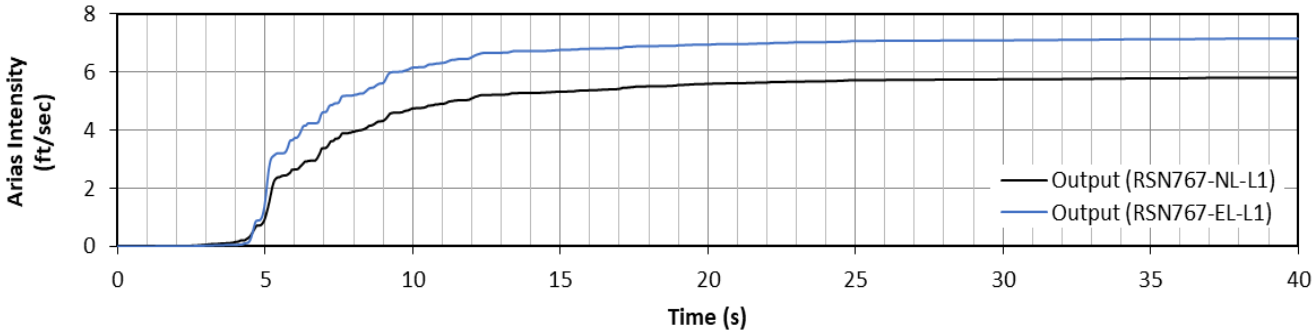


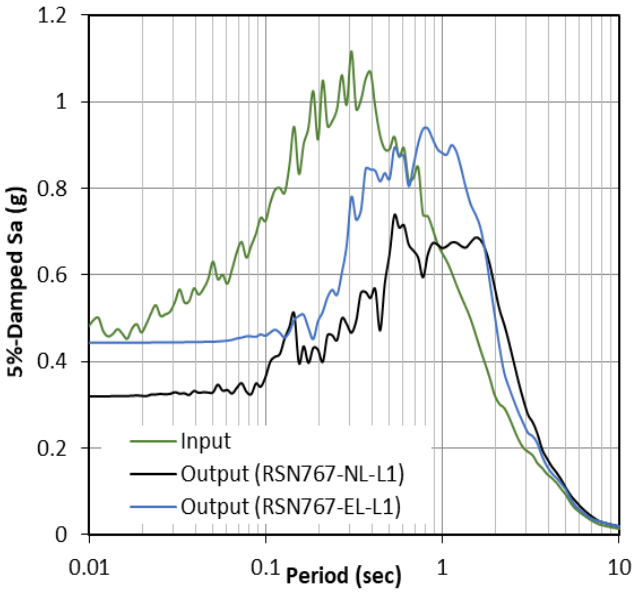


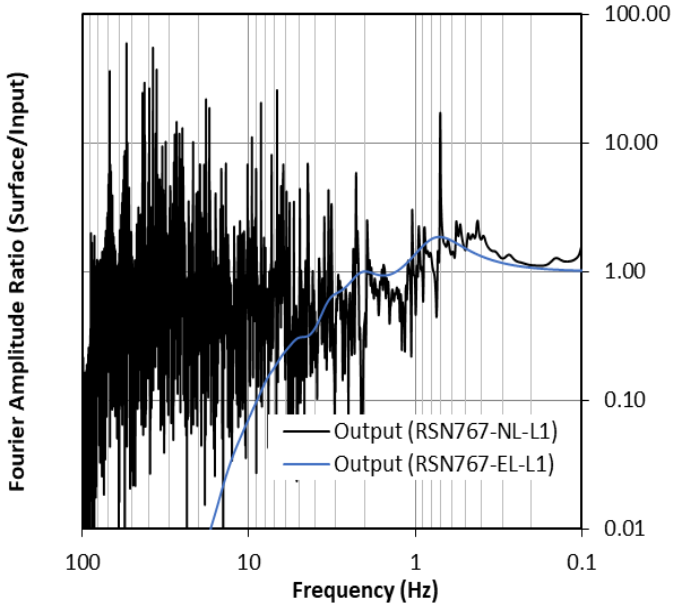
Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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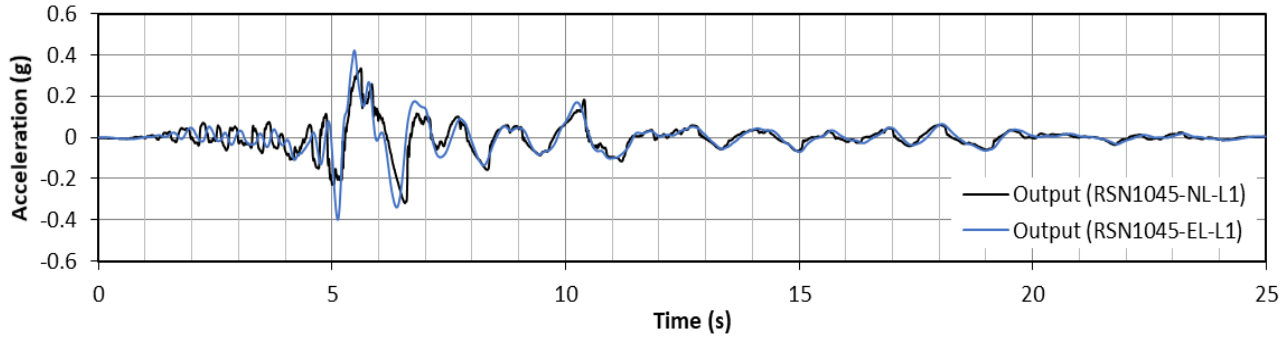


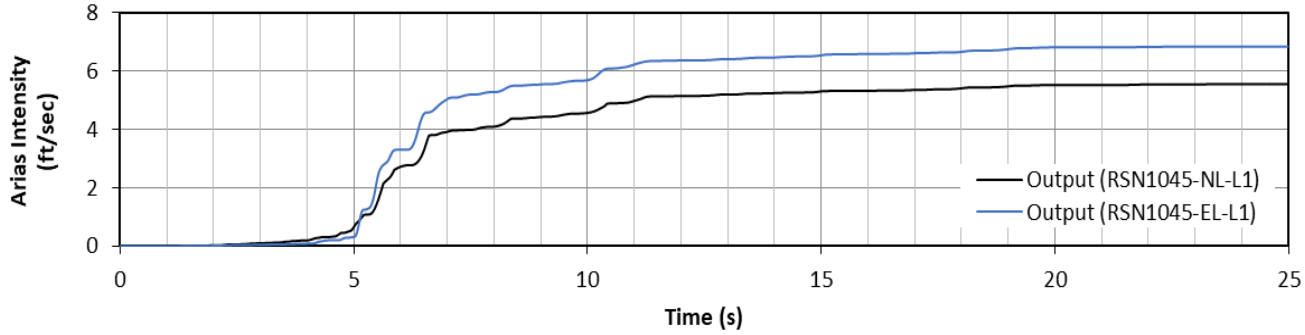


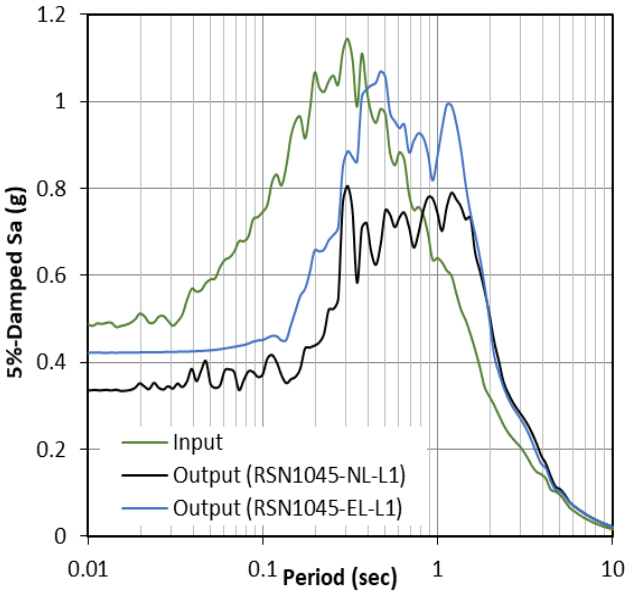


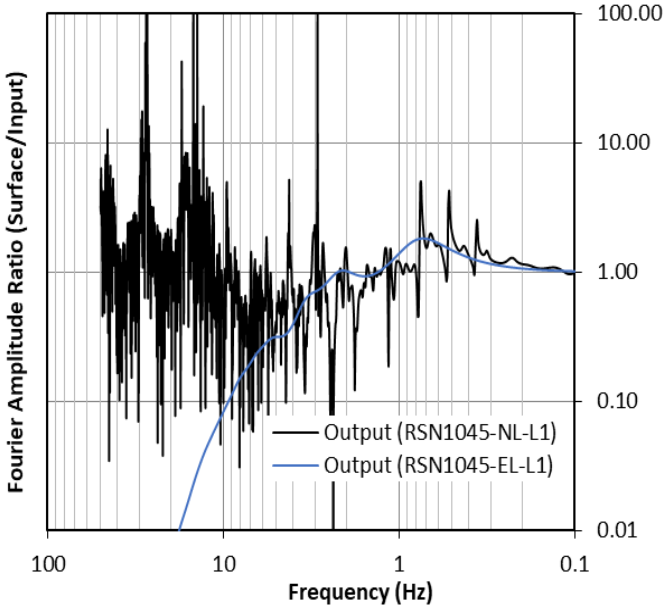
Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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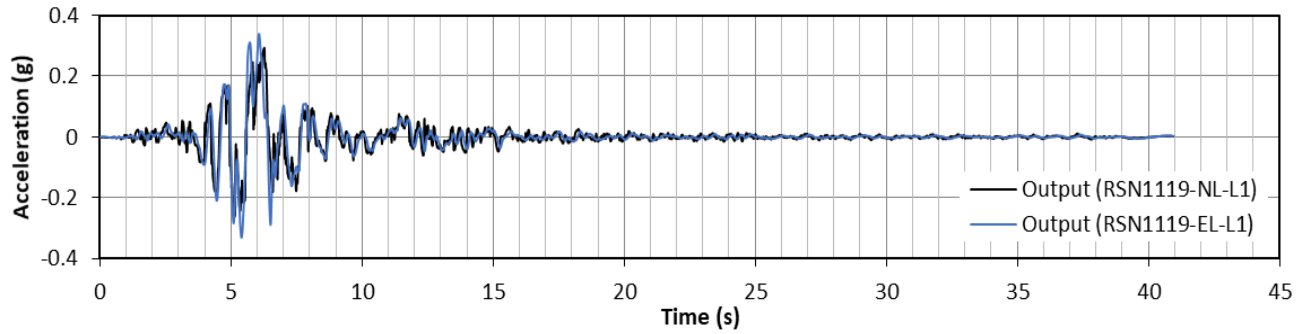


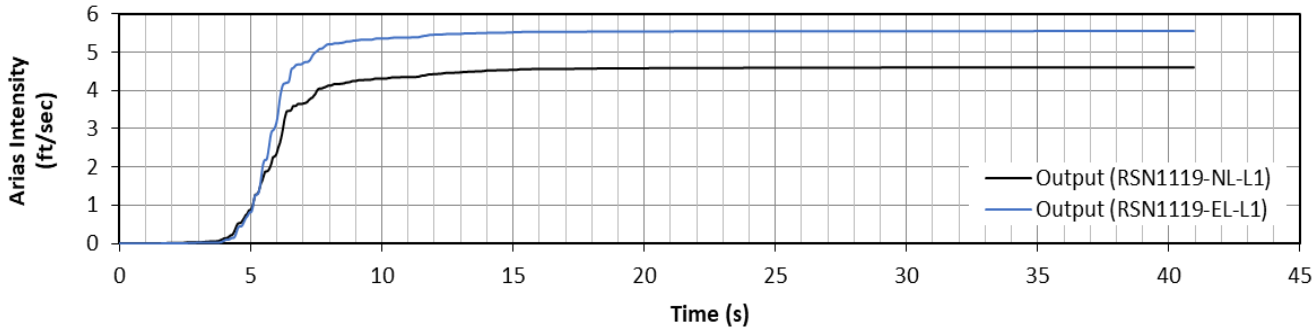


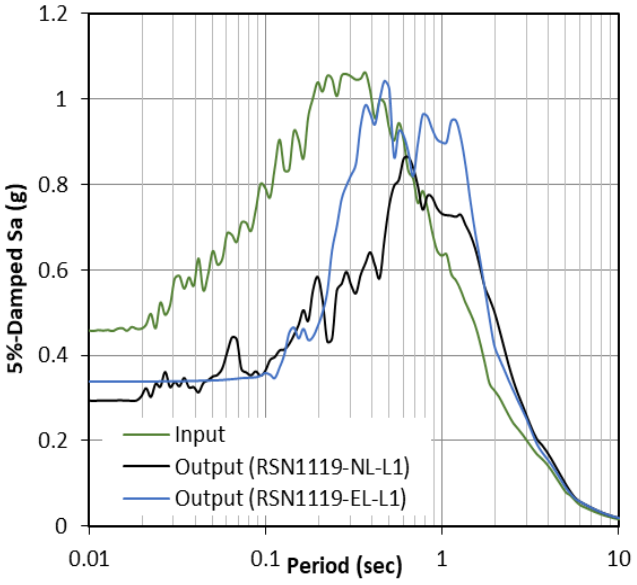


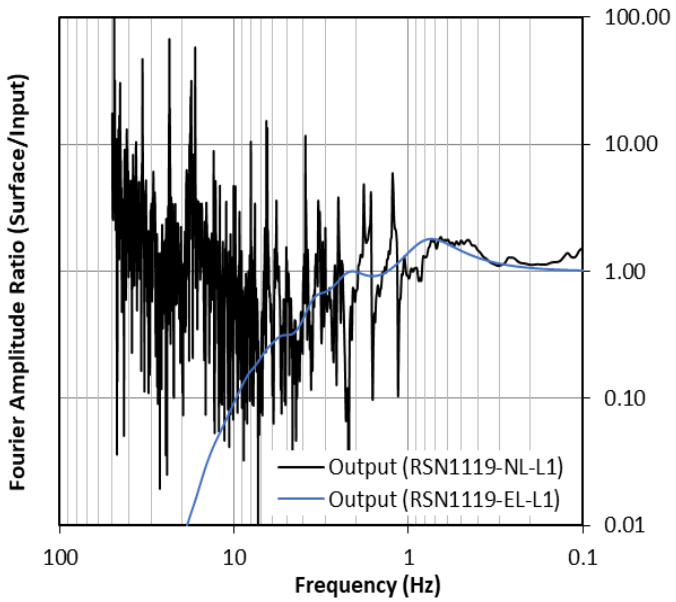
Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com	PROJECT NO. 20180876.001A	**GROUND MOTION RSN1045 RESPONSE AT GROUND SURFACE**	FIGURE **F-15**
	DATE: 06/2020		
	DRAWN: JLB		
	CHECKED BY: ZZ	CAMINO DEL MAR BRIDGE REPLACEMENT OVER SAN DIEGUITO RIVER - PHASE 0 DEL MAR, CALIFORNIA	
	File Name: GM3 Response.ppt		



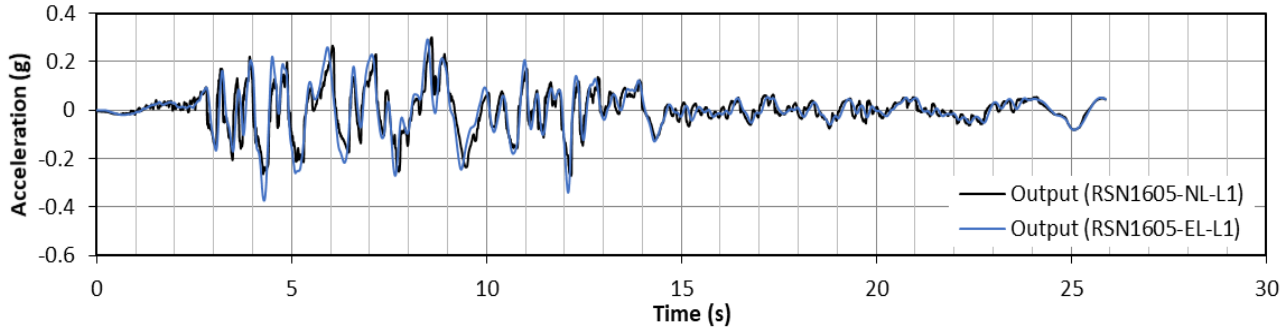


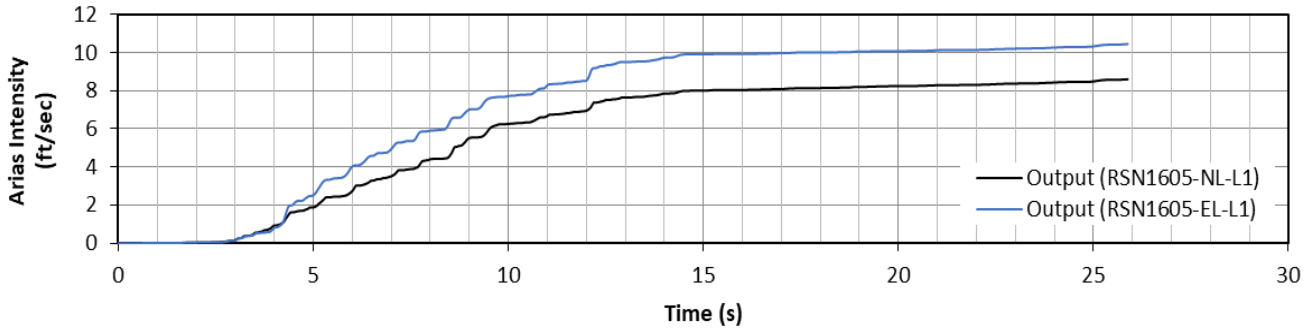


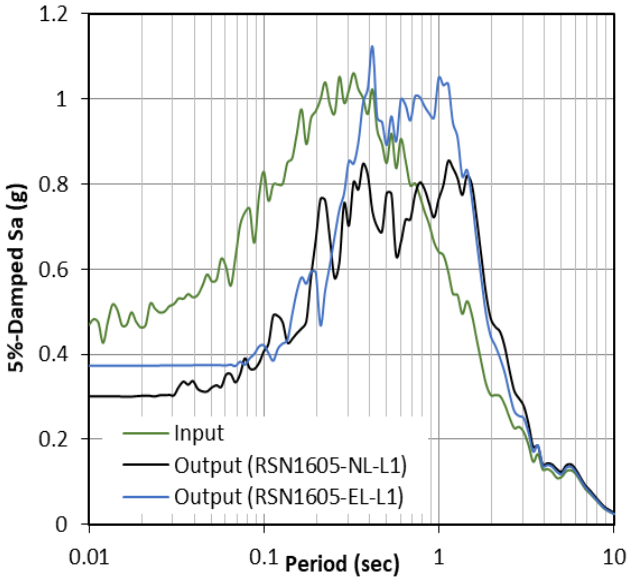


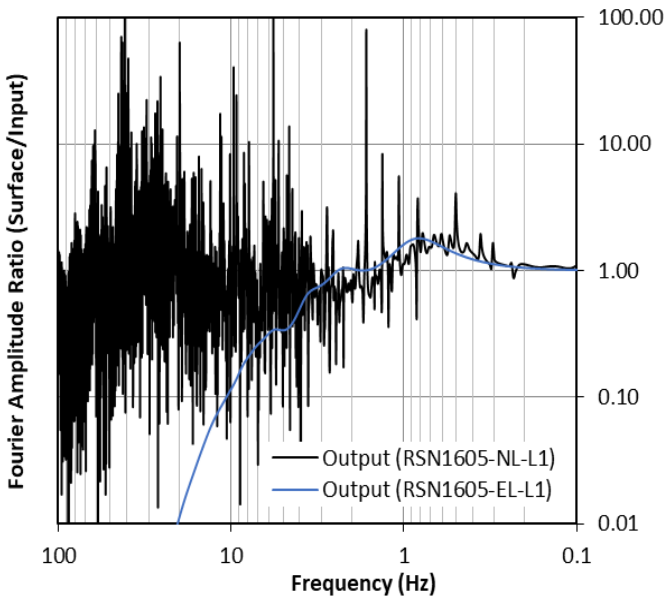
Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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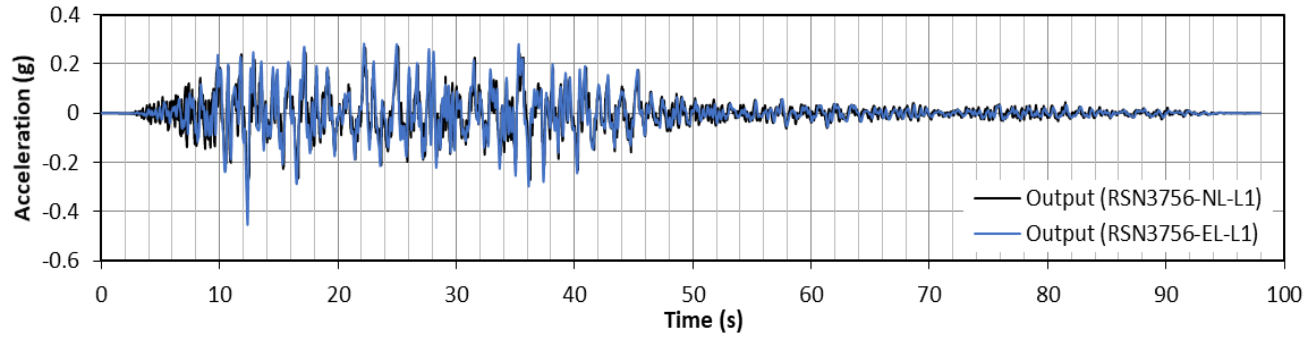
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DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM5 Response.ppt

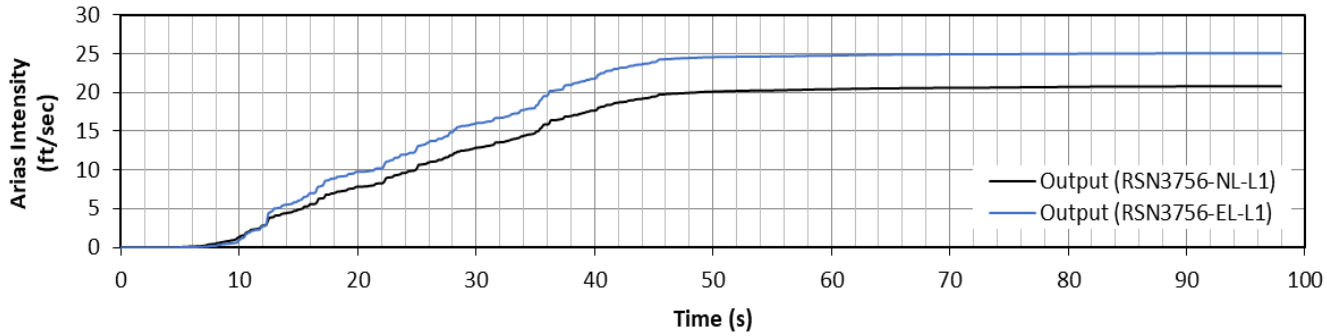
GROUND MOTION RSN1605 RESPONSE AT GROUND SURFACE

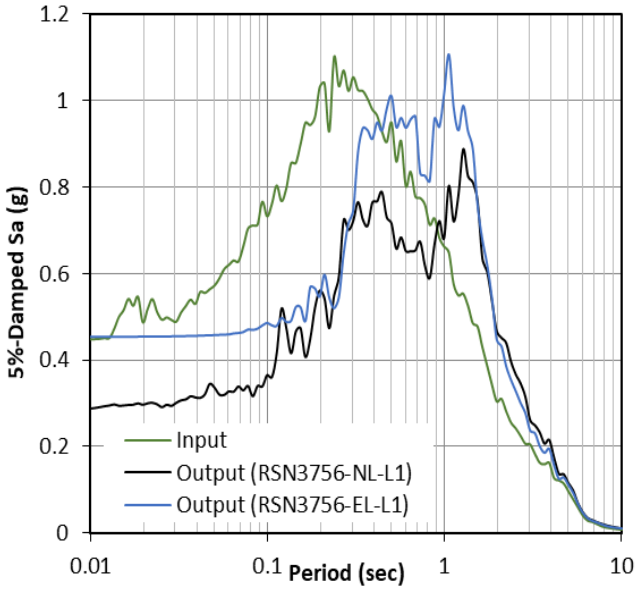
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

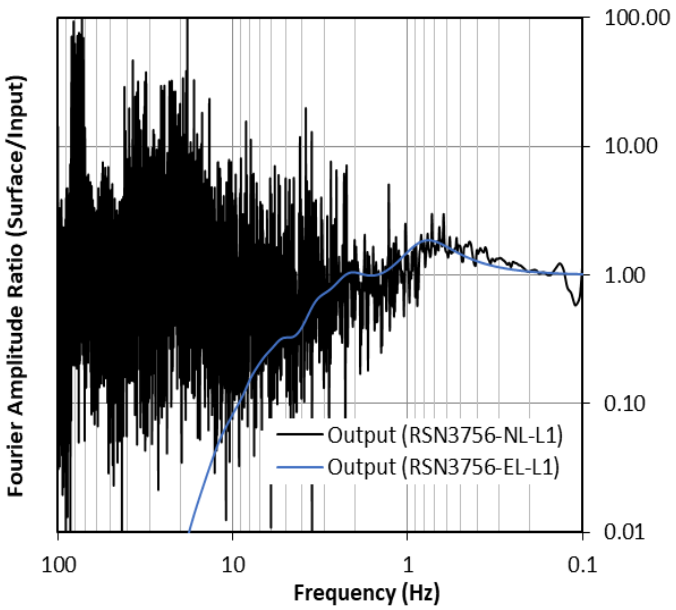
FIGURE

F-17









Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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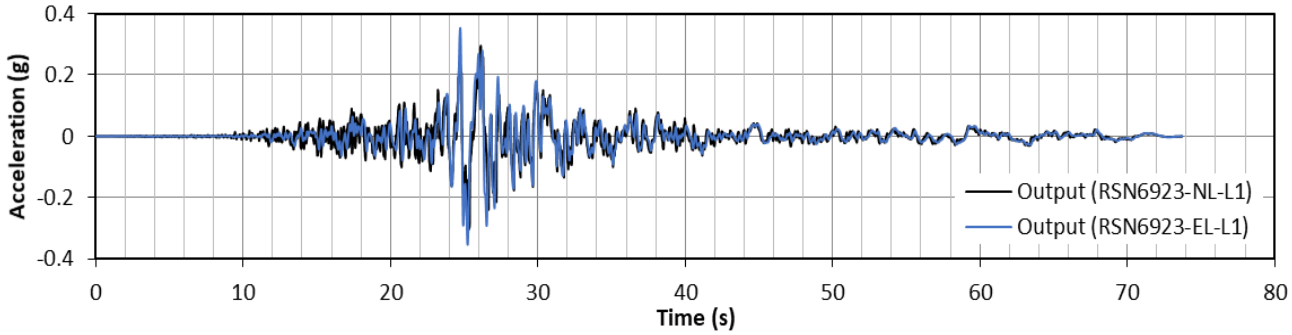
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM6 Response.ppt

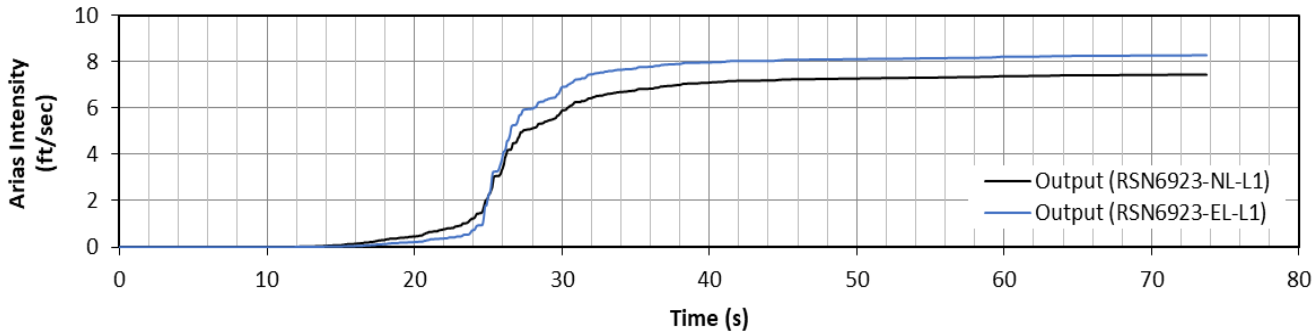
GROUND MOTION RSN3756 RESPONSE AT GROUND SURFACE

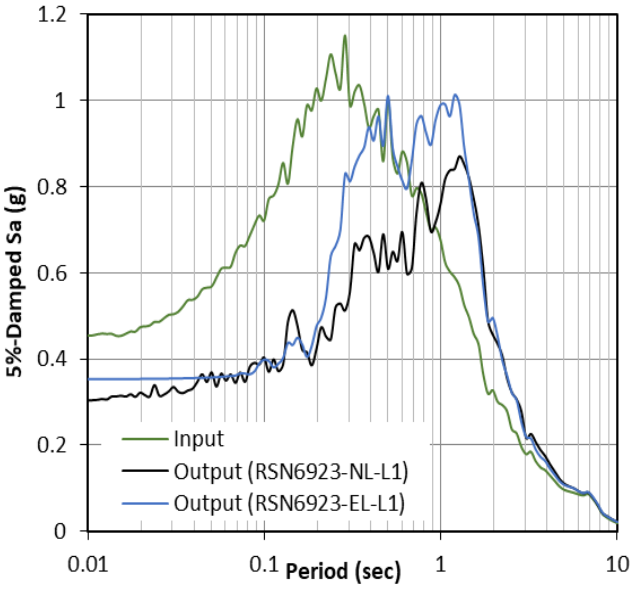
CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

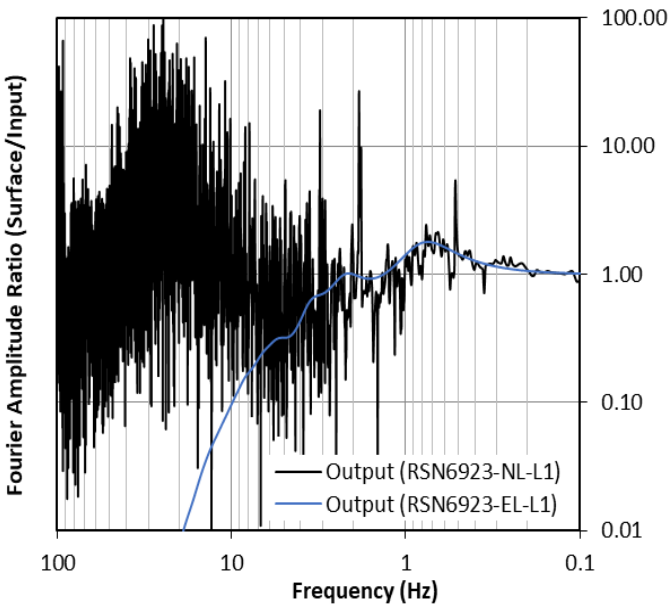
FIGURE

F-18









Notes: NL = Non-Linear; EL = Equivalent Linear; L1 = Layer 1

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PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	GM7 Response.ppt

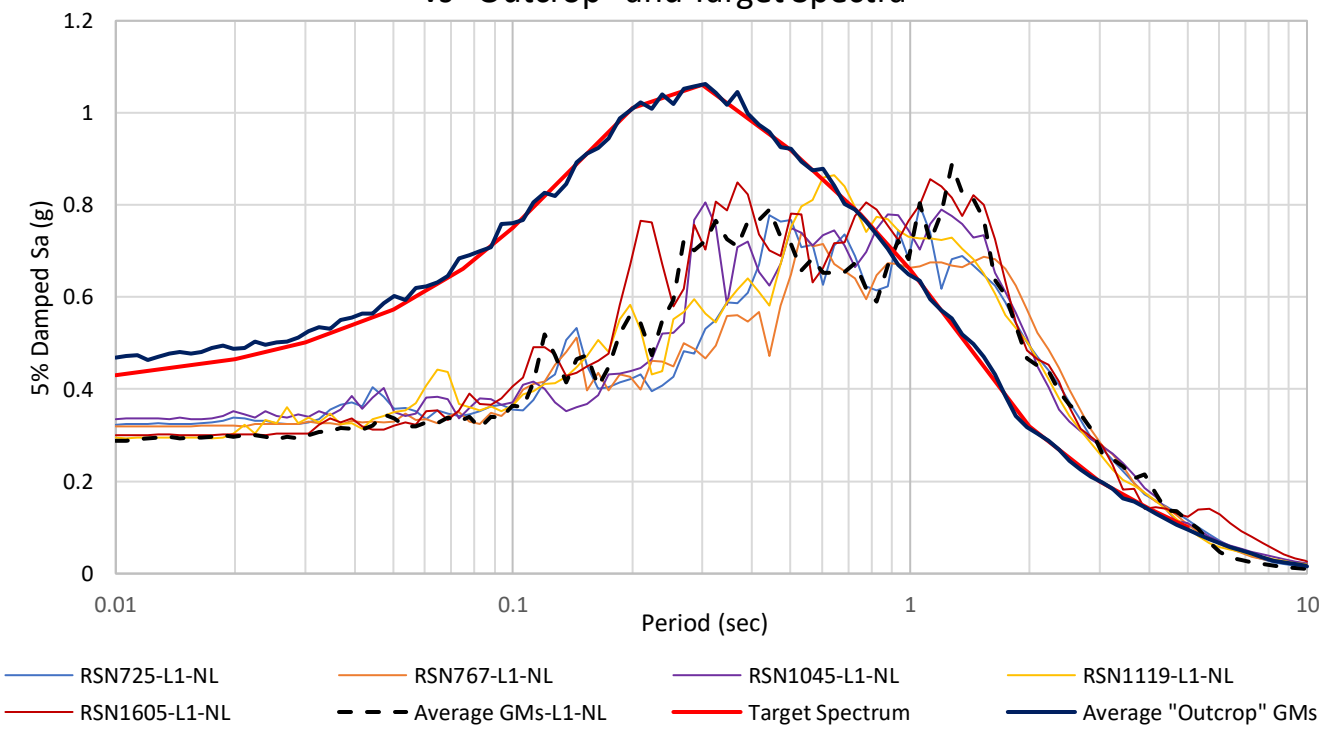
GROUND MOTION RSN6923 RESPONSE AT GROUND SURFACE

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

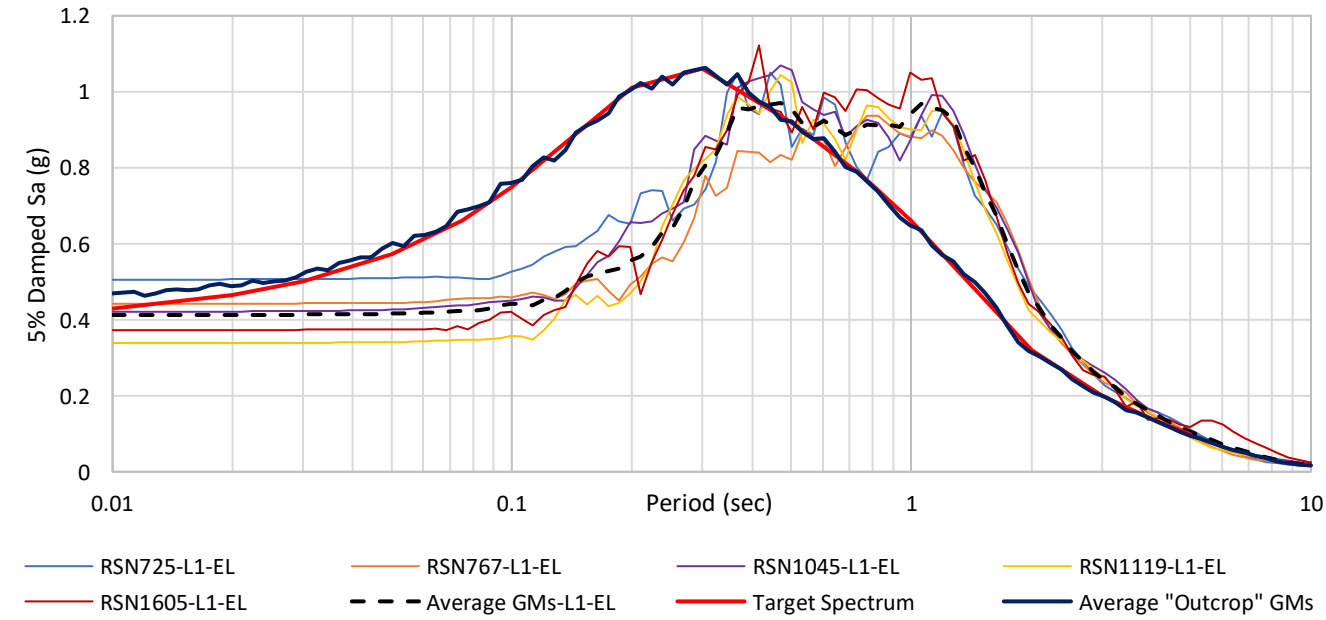
FIGURE

F-19

Non-Linear Site Response Results at Surface vs "Outcrop" and Target Spectra



Equivalent Linear Site Response Results at Surface vs "Outcrop" and Target Spectra



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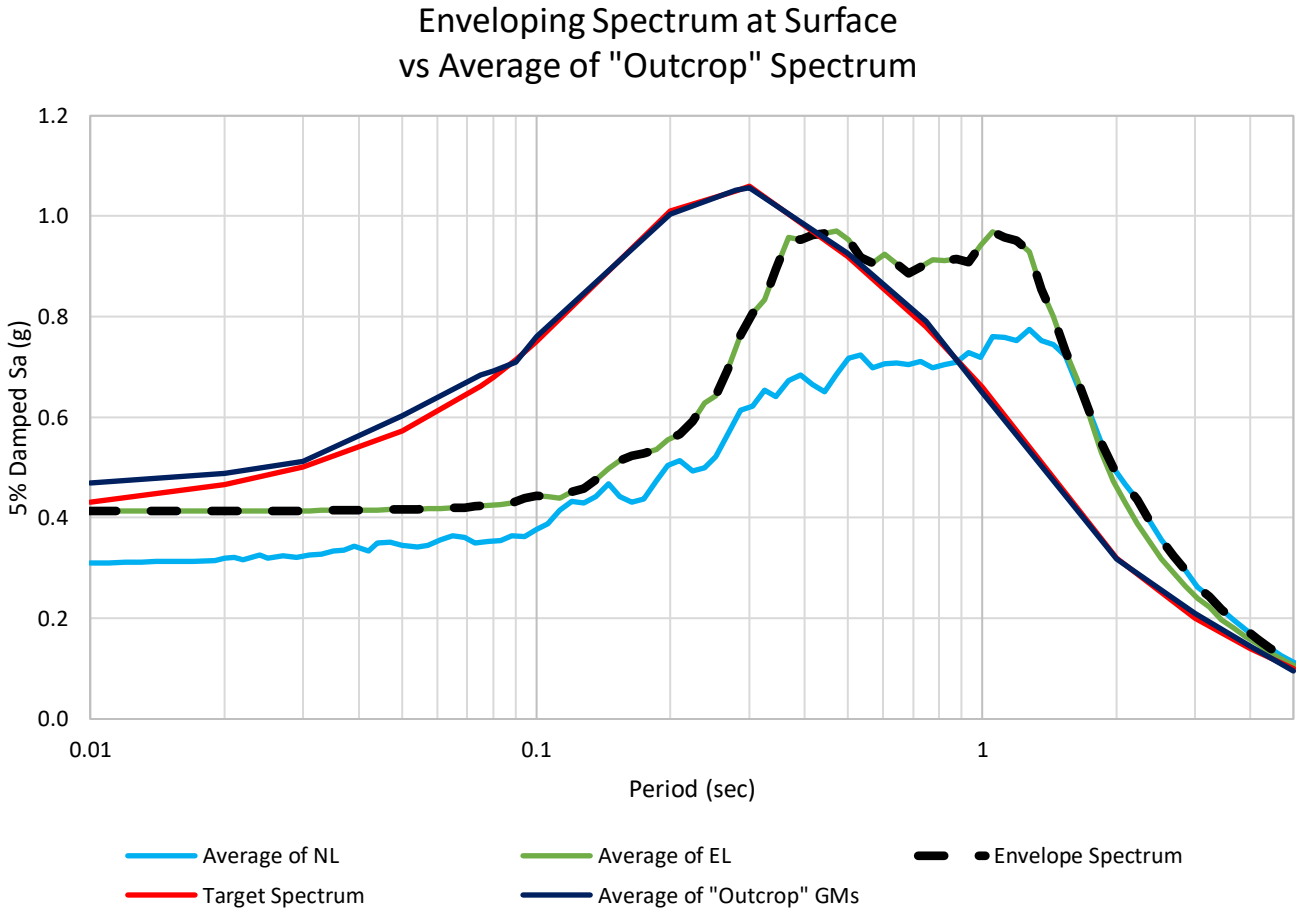
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DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	SiteResults.ppt

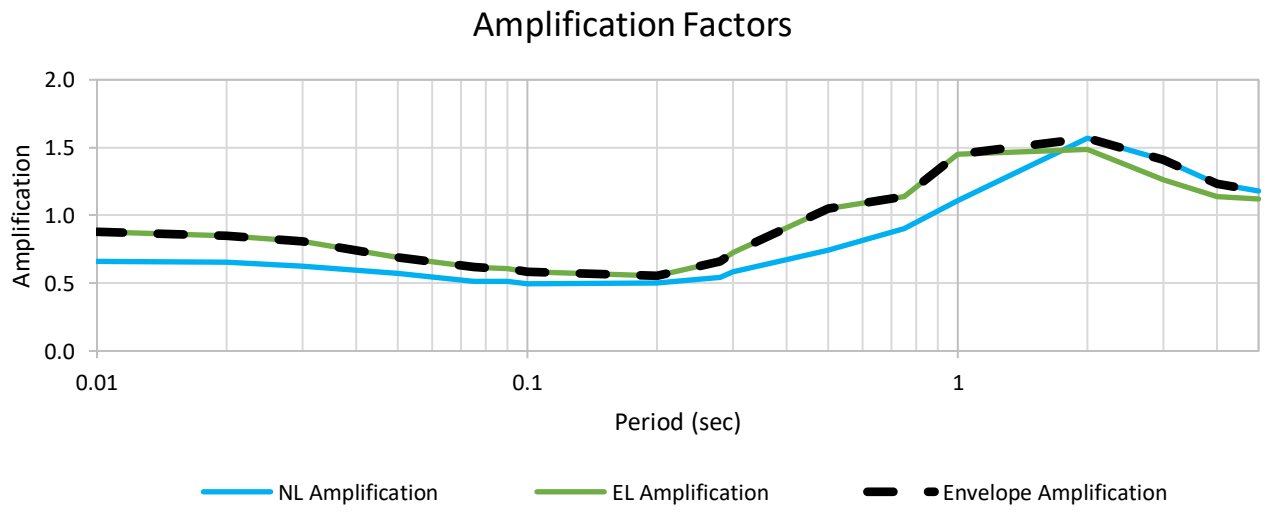
AVERAGE SITE RESPONSE RESULTS

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE

F-20





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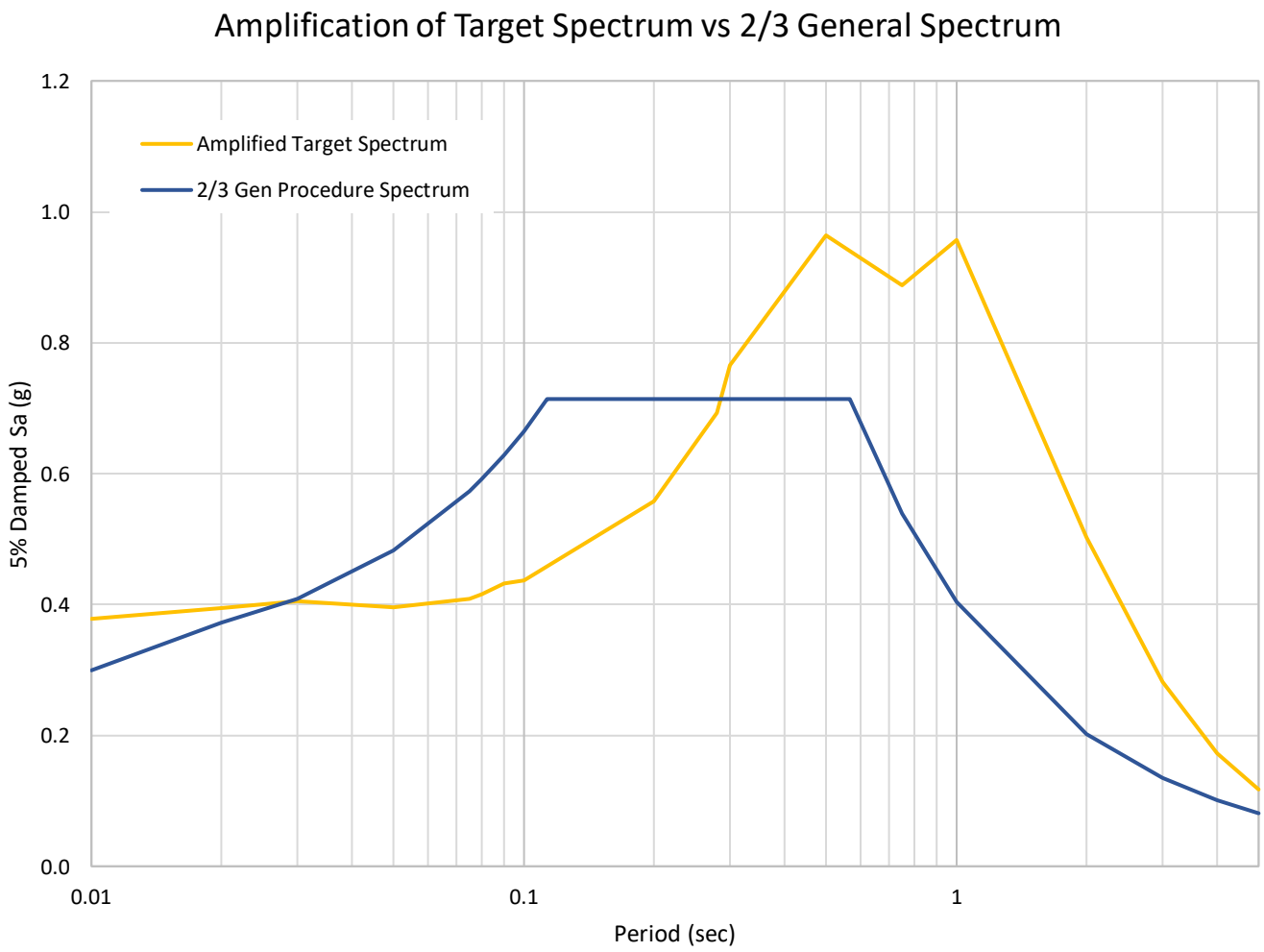
PROJECT NO.	20180876.001A
DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	Amplification.ppt

ENVELOPE SPECTRUM AND SITE AMPLIFICATION RESULTS

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

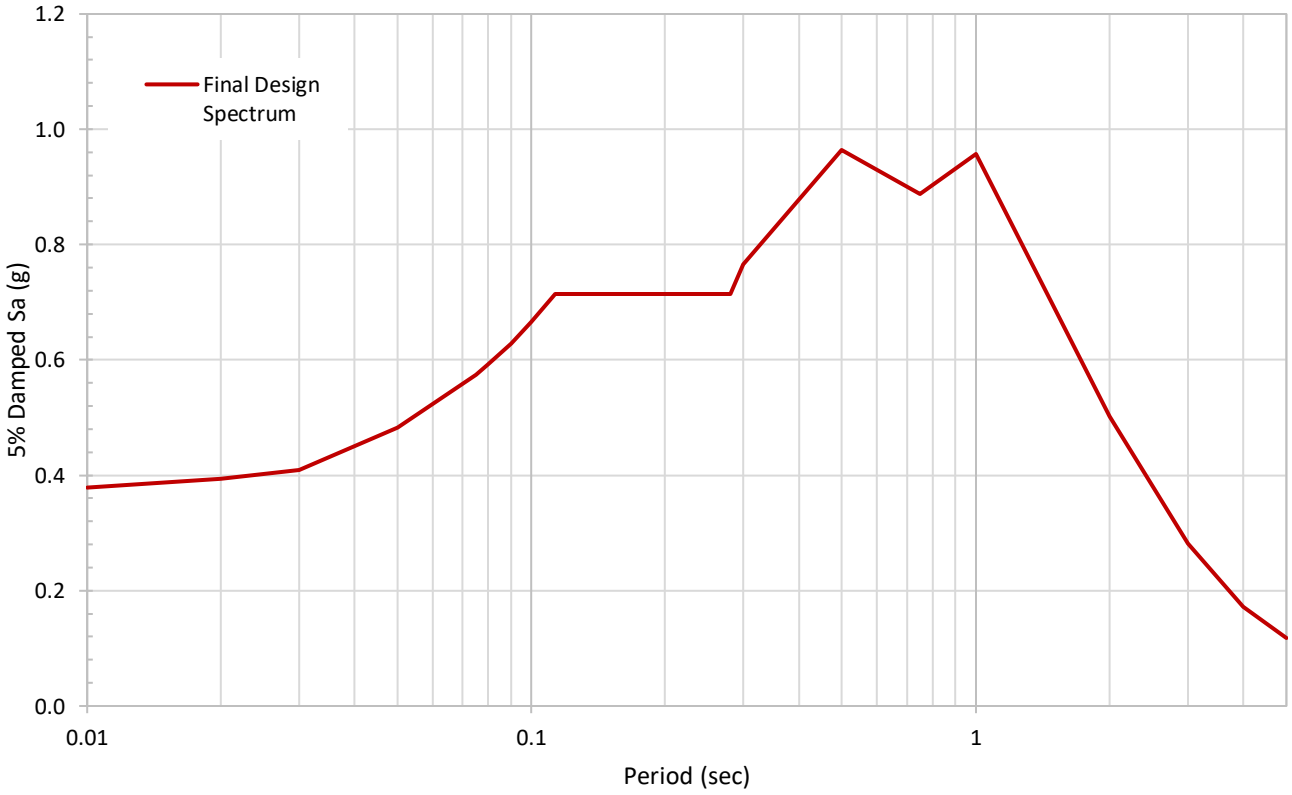
FIGURE

F-21

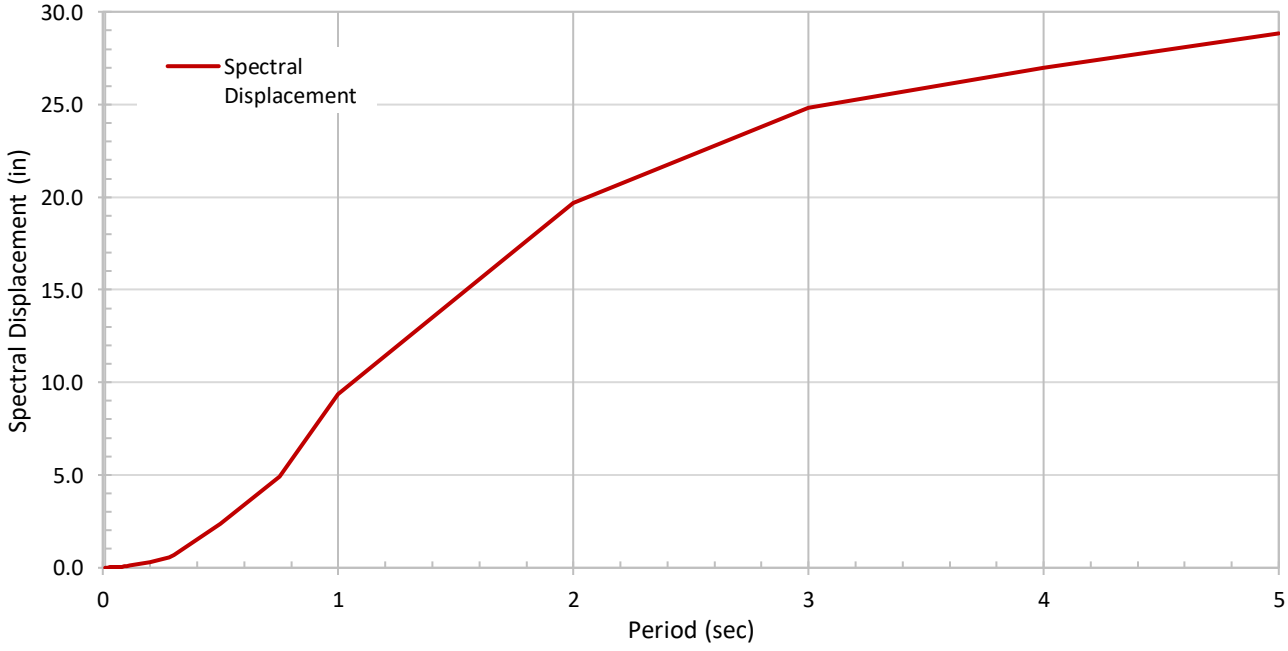


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	DATE: 06/2020		
	DRAWN: JLB		
	CHECKED BY: ZZ	CAMINO DEL MAR BRIDGE REPLACEMENT OVER SAN DIEGUITO RIVER - PHASE 0 DEL MAR, CALIFORNIA	
	File Name: Design Spectrum.ppt		

Design Response Spectrum



Displacement Spectrum



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DATE:	06/2020
DRAWN:	JLB
CHECKED BY:	ZZ
File Name:	Design Spectrum.ppt

SITE RESPONSE DESIGN SPECTRA

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE

F-23

APPENDIX G
CALCULATIONS

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APPENDIX G
CALCULATIONS

G.1 Earth Pressure Calculations

G.2 Liquefaction and Seismic Settlement Calculations

G.3 Liquefaction-Induced Lateral Spreading Analyses

G.4 Slope Stability and Seismic Slope Displacement Analyses

G.5 Axial Pile Capacity Analyses

G.1 EARTH PRESSURE CALCULATIONS

OBJECTIVE: Determine static lateral earth pressures using Coulomb Theory and Mononobe-Okabe seismic earth pressure.

REFERENCE:
AASHTO LRFD Bridge Design Specifications (BDS) with CA Amendments

INPUT SOIL PARAMETERS:

Material Description : Backfill

friction angle, ϕ'_f =	34	(degrees)
cohesion, c =	0	psf
unit weight, γ_s =	120	pcf
soil-wall friction, δ =	24	(degrees)
Buoyant unit weight, γ_B =	57.6	pcf (=γ_s-γ_w)

Wall Geometry:

θ =	90	(degrees)
θ_2 =	0	(degrees)

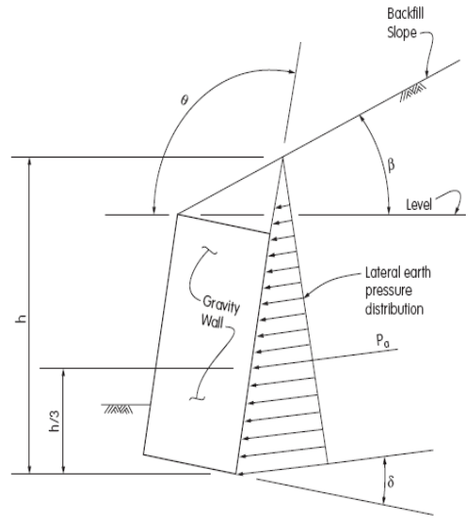


Figure 5.5.5.3-1 Notation for Coulomb Active Lateral Earth Pressure

EQUATIONS FOR EARTH PRESSURE COEFFICIENTS:

At-Rest Earth Pressure Coef.:

$$k_o = (1-\sin\phi'_f)(1+\sin\beta)$$ (BDS Equation 5.5.5.2-1)

Note: use BDS Eqn. 5.5.5.2-2 for OC soil

Active Earth Pressure Coef.:

$$k_a = \frac{\sin^2(\Theta+\phi'_f)}{\Gamma\left[\sin^2\Theta\sin(\Theta-\delta)\right]} \qquad \Gamma = \left[1+\left(\frac{\sin(\phi'_f+\delta)\sin(\phi'_f-\beta)}{\sin(\theta-\delta)\sin(\theta+\beta)}\right)^{0.5}\right]^2$$ (BDS Eqn's 5.5.5.3-1&2)

Note: Eqn. 5.5.5.3-1 is the same as Rankine k_a when δ = 0

Effective Fluid Unit Weight:

$EFW_{ka} = \gamma_s * k_a$

$EFW_{k0} = \gamma_s * k_0$

CALCULATED STATIC ACTIVE AND AT REST EARTH PRESSURE VALUES:

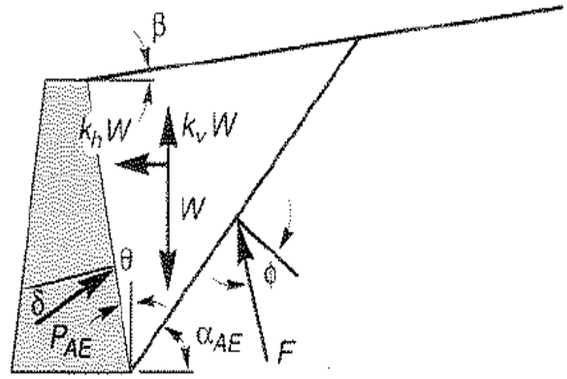
				Active Pressures		At-Rest Pressures		
Slope (H:V)	β (deg)	β (rad)	Γ	k_a	EFW_{ka} (lb/ft^3)	k_0	EFW_{k0} (lb/ft^3)	
level	0	0.000	2.960	**0.254**	**30.5**	**0.441**	**52.9**	Above GW
level	0	0.000	2.960	**0.254**	**77.0**	**0.441**	**87.8**	Below GW

MONONOBE-OKABE SEISMIC EARTH PRESSURES:

PGA = 0.40 g's

k_h = 1/2*PGA = 0.200

k_v = 0.000



Reference:
Kramer, S.L., 1996, *Geotechnical Earthquake Engineering*, Prentice Hall, NJ, pp. 478-481

ψ = **arctan (k_h/(1-k_v))**

ψ = 0.197396 (radians)

$$K_{AE} = \frac{\cos^2(\phi-\psi-\theta_2)}{\cos\psi\cos^2\theta_2\cos(\psi+\theta_2+\delta)} \times \left[1+\sqrt{\frac{\sin(\phi+\delta)\sin(\phi-\psi-\beta)}{\cos(\delta+\psi+\theta_2)\cos(\beta-\theta_2)}}\right]^{-2}$$

$$\phi \geq \beta + \psi$$

$\Delta k_{ae} = k_{AE} - k_a$

$\Delta P_{ae} = 1/2*\gamma_s*\Delta k_{ae}*H^2$

Slope (H:V)	β (deg)	β (rad)	k_a	k_{AE}	Δk_{ae}	**ΔP_{ae}** (lb/ft)	**$EFW_{\Delta Kae}$** (pcf)
Level	0	0.000	0.254	0.399	0.145	**8.7*H^2**	**17.4**

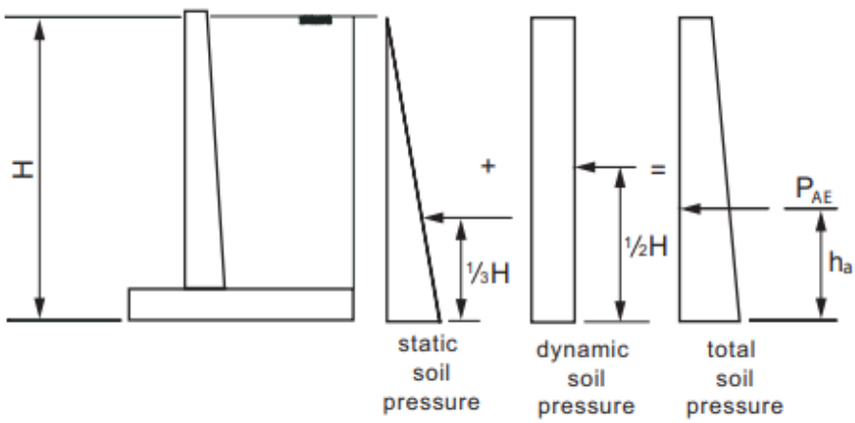
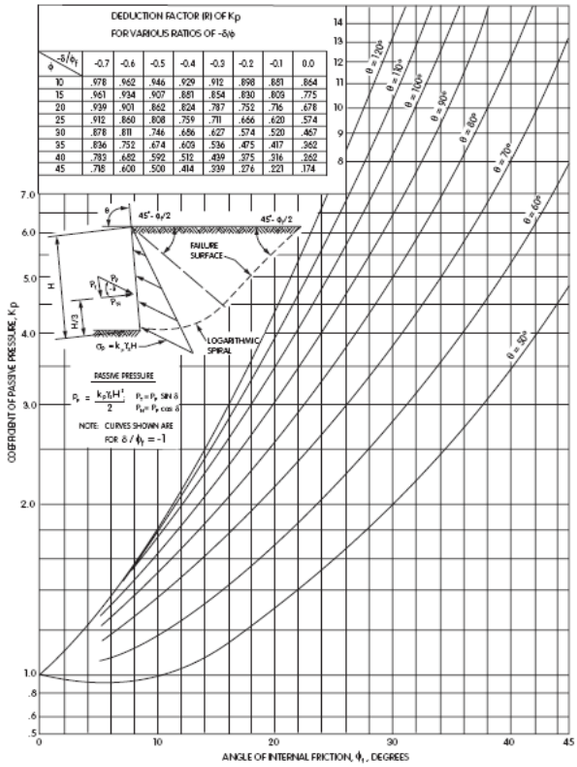


Figure 3 Seismic Loading
(Reference: 2010 California Amendments)

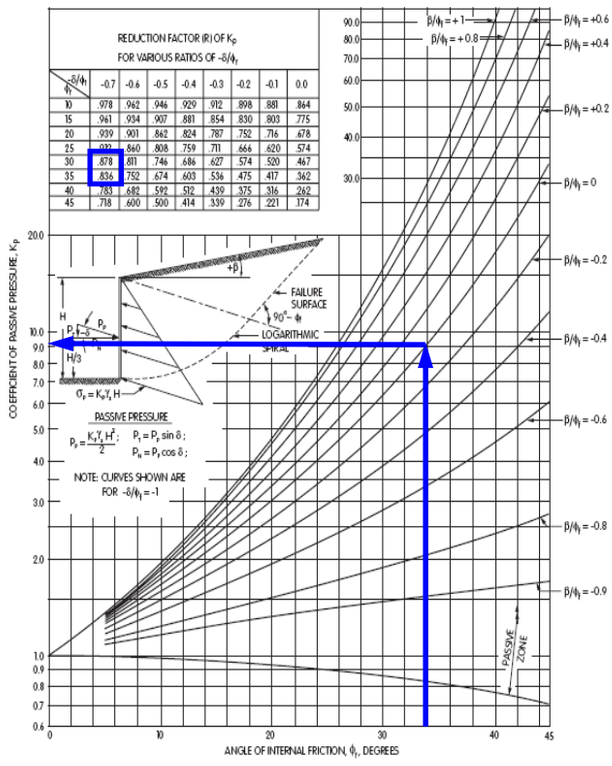
KLEINFELDER
Bright People. Right Solutions.

PASSIVE LATERAL EARTH PRESSURE COEFFICIENT, k_p

Use Caltrans charts for log-spirol



BDS Figure 5.5.5.4-1 - Sloping Wall and Level Backfill



BDS Figure 5.5.5.4-2 - Vertical Wall with Sloping Backfill

$-\delta/\phi'_f$ = -0.71 beta/phi 0

CALCULATED EARTH PRESSURE VALUES (Above GW):

						Passive Pressure		
Slope (H:V)	β (deg)	β (rad)	β/ϕ'_f	un-reduced k_p	**Reduction Factor, R**	k_p	EFW_{kp} (lb/ft^3)	Design. (lb/ft^3)
level	0	0.000	0.00	9.0	0.844	**7.60**	**911.5**	**900**
						below GW	**499.9**	**500**
						with LRFD Factor = 0.5:		450
						below GW with LRFD Factor = 0.5:		250

G.2 LIQUEFACTION AND SEISMIC SETTLEMENT CALCULATIONS

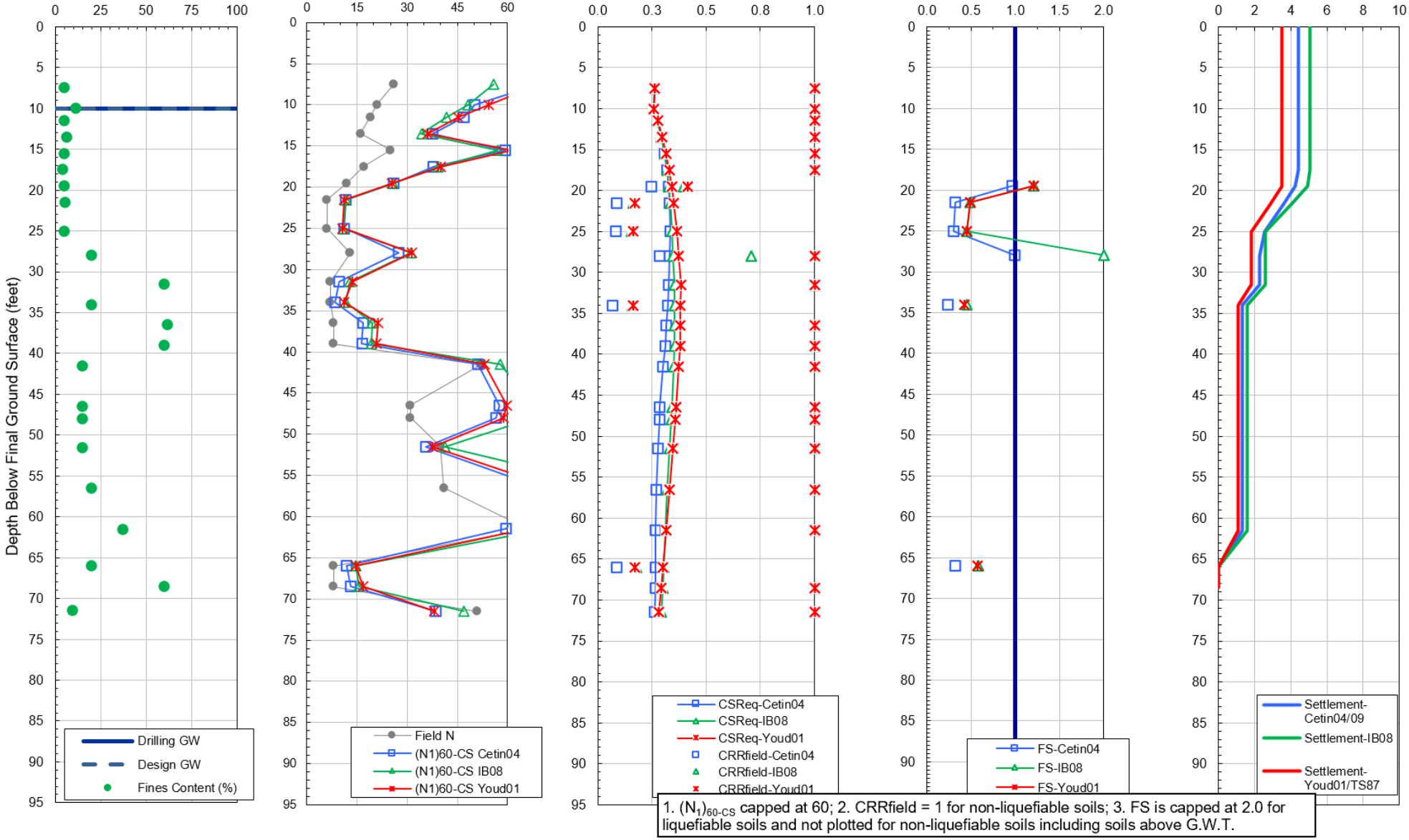
Boring ID: **R-20-001 (0 to 70 ft)**

M_w= **6.6**
PGA= **0.41g**

Groundwater Depth During Drilling (ft) = **10.0 ft**
Design Groundwater Depth (ft) = **10.0 ft**

Existing Ground Elevation = **16.0 ft**
Final Ground Elevation = **16.0 ft**

Ana. by: J. Bonfiglio
Checked by: Z. Zafir



1. $(N_1)_{60\text{-}CS}$ capped at 60; 2. CRRfield = 1 for non-liquefiable soils; 3. FS is capped at 2.0 for liquefiable soils and not plotted for non-liquefiable soils including soils above G.W.T.

KLEINFELDER
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Project Name: Camino Del Mar Bridge Replacement
Project No.: 20180876.001A
Project Location: Del Mar, California

LIQUEFACTION ANALYSIS (R-20-001)

Date 5/11/2020

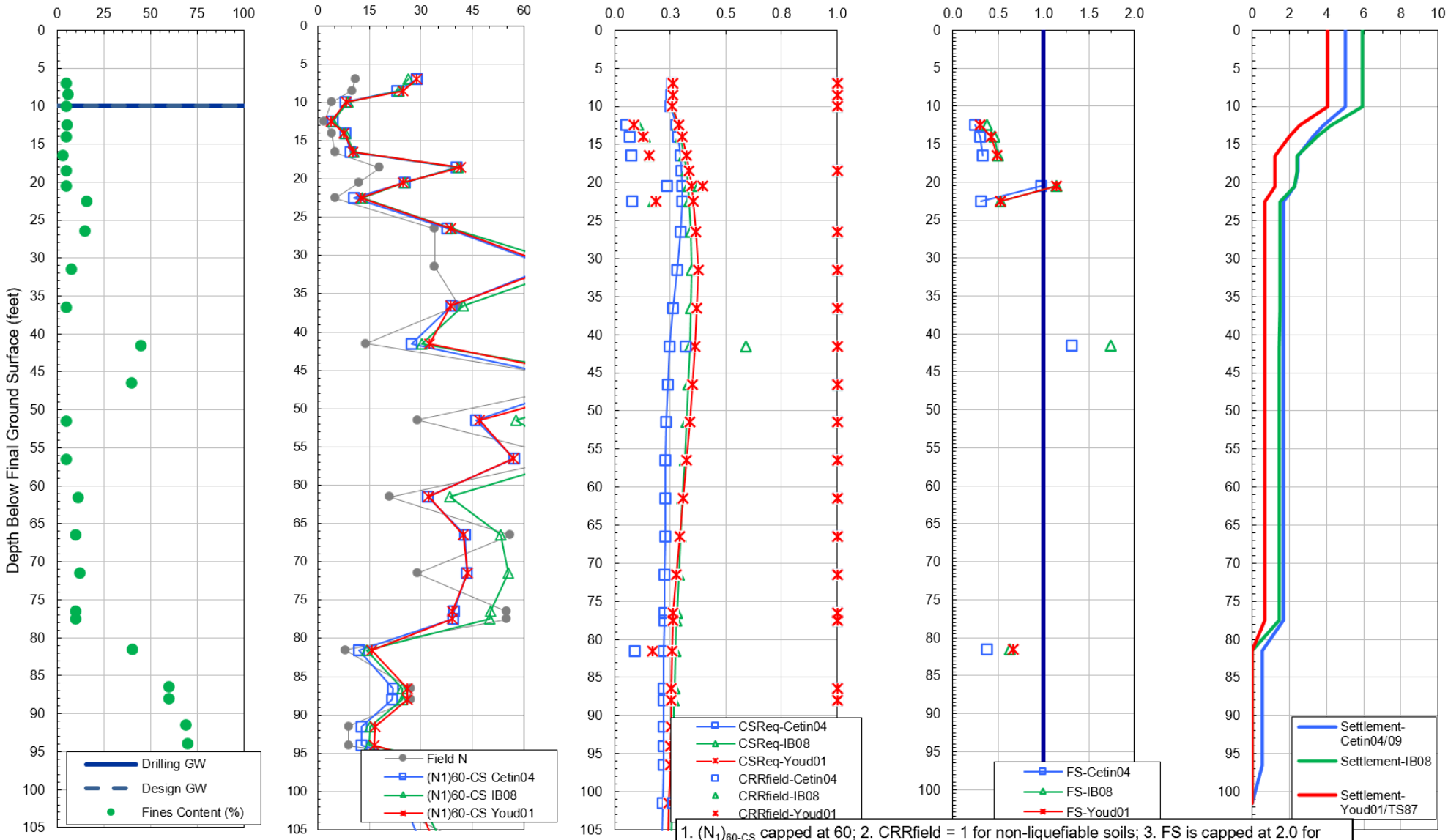
Boring ID: **R-20-002 (0 to 70 ft)**

M_w= **6.6**
PGA= **0.41g**

Groundwater Depth During Drilling (ft) = **10.0 ft**
Design Groundwater Depth (ft) = **10.0 ft**

Existing Ground Elevation = **16.0 ft**
Final Ground Elevation = **16.0 ft**

Ana. by: J. Bonfiglio
Checked by: Z. Zafir



1. $(N_1)_{60\text{-}CS}$ capped at 60; 2. CRRfield = 1 for non-liquefiable soils; 3. FS is capped at 2.0 for liquefiable soils and not plotted for non-liquefiable soils including soils above G.W.T.

KLEINFELDER
Bright People. Right Solutions.

Project Name: Camino Del Mar Bridge Replacement
Project No.: 20180876.001A
Project Location: Del Mar, California

LIQUEFACTION ANALYSIS (R-20-002)

Date 5/11/2020

Seismic Settlement of Dry Sands
Tokimatsu & Seed (1987)

Project No. 20180876.001A
Project Name Camino Del Mar Bridge Replacement
Analysis by J. Bonfiglio
Checked by Z. Zafir

M =	6.63	Moment Magnitude (Use Modal value)
PHA =	0.41	g (Peak horizontal acceleration; use PGA_M)
γ =	120	pcf (unit weight of soil)
Ko =	0.5	(at-rest coefficient)

Boring	Depth at middle of sampler (ft)	Layer Thickness (ft)	Soil Classification	Anticipated Fines Content (%)	r_d	σ_0 (psf)	σ'_m (psf)	σ'_m (tsf)	N (blows/ft)	SAMPLER TYPE (1) SPT w/out liners (2) SPT w/ liners (3) MC (4) CAL	Sampler Correction, C_S	Overbuden Correction, C_N	Fine Content Correction	N_1 (blows/ft)	Gmax (psf)	Effective Shear Strain, γ_{eff} (Geff/Gmax)	Effective Shear Strain, γ_{eff} (from Fig. 11)	Effective Shear Strain, γ_{eff} (%)	Volumetric Strain (from Figure 13) (%)	Results: Seismic Settlement for M7.5 (in)	Seismic Settlement for M5.25 (in)	Seismic Settlement for M6 (in)	Seismic Settlement for M6.75 (in)	Seismic Settlement for M8.5 (in)
R-20-001	3	6	SP-SM	5	0.993	360	240	0.12	26	1	1.1	1.70	1.0	50	1138556	8.37E-05	1.6E-04	1.6E-02	0.0000	0.000	0.00	0.00	0.00	0.00
R-20-001	7	2	SP-SM	5	0.985	840	560	0.28	26	1	1.1	1.54	1.0	45	1685058	1.31E-04	1.9E-04	1.9E-02	0.0000	0.000	0.00	0.00	0.00	0.00
R-20-001	9	2	SP-SM	11	0.980	1080	720	0.36	21	1	1.1	1.36	1.1	33	1712637	1.65E-04	2.9E-04	2.9E-02	0.0150	0.007	0.00	0.00	0.01	0.01
																				0.000	0.00	0.00	0.00	0.00
																				0.000	0.00	0.00	0.00	0.00
																				0.00	0.00	0.00	0.00	0.00
																				0.00	0.00	0.00	0.00	0.00
																				0.007	0.00	0.00	0.01	0.01

Double the value for bi-directional shaking
Select= 0.01 for M 6.63

(use to read Fig. 11) (use to read Fig. 13) (use to read Fig. 11) (use to read Fig. 13)

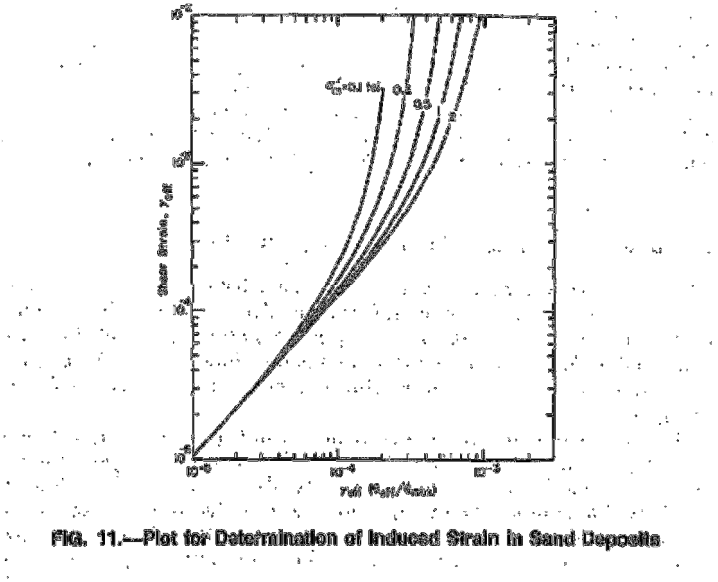


FIG. 11.—Plot for Determination of Induced Strain in Sand Deposits

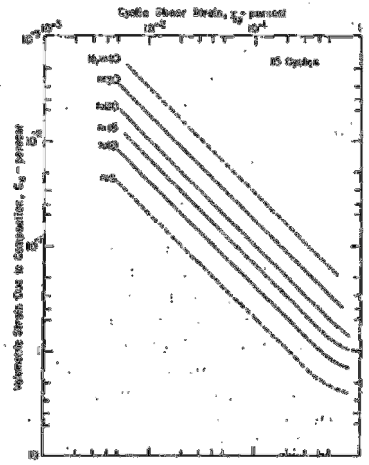


FIG. 13.—Relationship between Volumetric Strain, Shear Strain, and Penetration Resistance for Dry Sands

Seismic Settlement of Dry Sands
Tokimatsu & Seed (1987)

Project No. 20180876.001A
Project Name Camino Del Mar Bridge Replacemer
Analysis by J. Bonfiglio
Checked by Z. Zafir

M =	6.63	Moment Magnitude (Use Modal value
PHA =	0.41	g (Peak horizontal acceleration; use PG_{M})
γ =	120	pcf (unit weight of soil)
Ko =	0.5	(at-rest coefficient)

Boring	Depth at middle of sampler (ft)	Layer Thickness (ft)	Soil Classification	Anticipated Fines Content (%)	r_d	σ_o (psf)	σ'_m (psf)	σ'_m (tsf)	N (blows/ft)	SAMPLER TYPE (1) SPT w/out liners (2) SPT w/ liners (3) MC (4) CAL	Sampler Correction, C_S	Overbuden Correction, C_N	Fine Content Correction	N_1 (blows/ft)	Gmax (psf)	Effective Shear Strain, γ_{eff} (Geff/Gmax)	Effective Shear Strain, γ_{eff} (from Fig. 11)	Effective Shear Strain, γ_{eff} (%)	Volumetric Strain (from Figure 13) (%)	Results: Seismic Settlement for M7.5 (in)	Seismic Settlement for M5.25 (in)	Seismic Settlement for M6 (in)	Seismic Settlement for M6.75 (in)	Seismic Settlement for M8.5 (in)
R-20-002	2.5	5	SP	3.3	0.995	300	200	0.10	10	1	1.1	1.70	1.0	20	763895	1.04E-04	2.4E-04	2.4E-02	0.0250	0.030	0.01	0.02	0.03	0.04
R-20-002	6	2	SP-SM	5	0.987	720	480	0.24	11	1	1.1	1.67	1.0	21	1212090	1.56E-04	2.7E-04	2.7E-02	0.0250	0.012	0.00	0.01	0.01	0.02
R-20-002	8	2	SP-SM	5.6	0.983	960	640	0.32	10	1	1.1	1.44	1.0	17	1297835	1.94E-04	4.8E-04	4.8E-02	0.0550	0.026	0.01	0.02	0.02	0.03
R-20-002	9.5	1	SP-SM	5	0.979	1140	760	0.38	4	1	1.1	1.32	1.0	7	1046004	2.84E-04	1.2E-03	1.2E-01	0.4000	0.096	0.04	0.06	0.08	0.12
																				0.000	0.00	0.00	0.00	0.00
																				0.00	0.00	0.00	0.00	0.00
																				0.00	0.00	0.00	0.00	0.00
																				0.164	0.07	0.10	0.14	0.21

Double the value for bi-directional shakin
Select= 0.27 for M 6.63

(use to read Fig. 11)

(use to read Fig. 13)

(use to read Fig. 11)

(use to read Fig. 13)

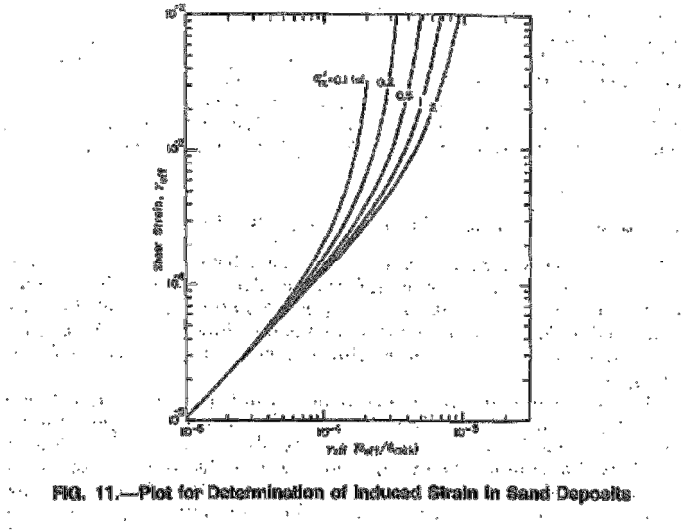


FIG. 11.—Plot for Determination of Induced Strain in Sand Deposits

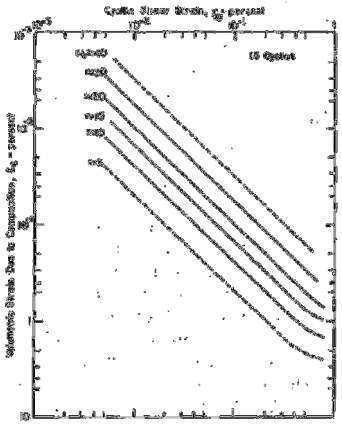
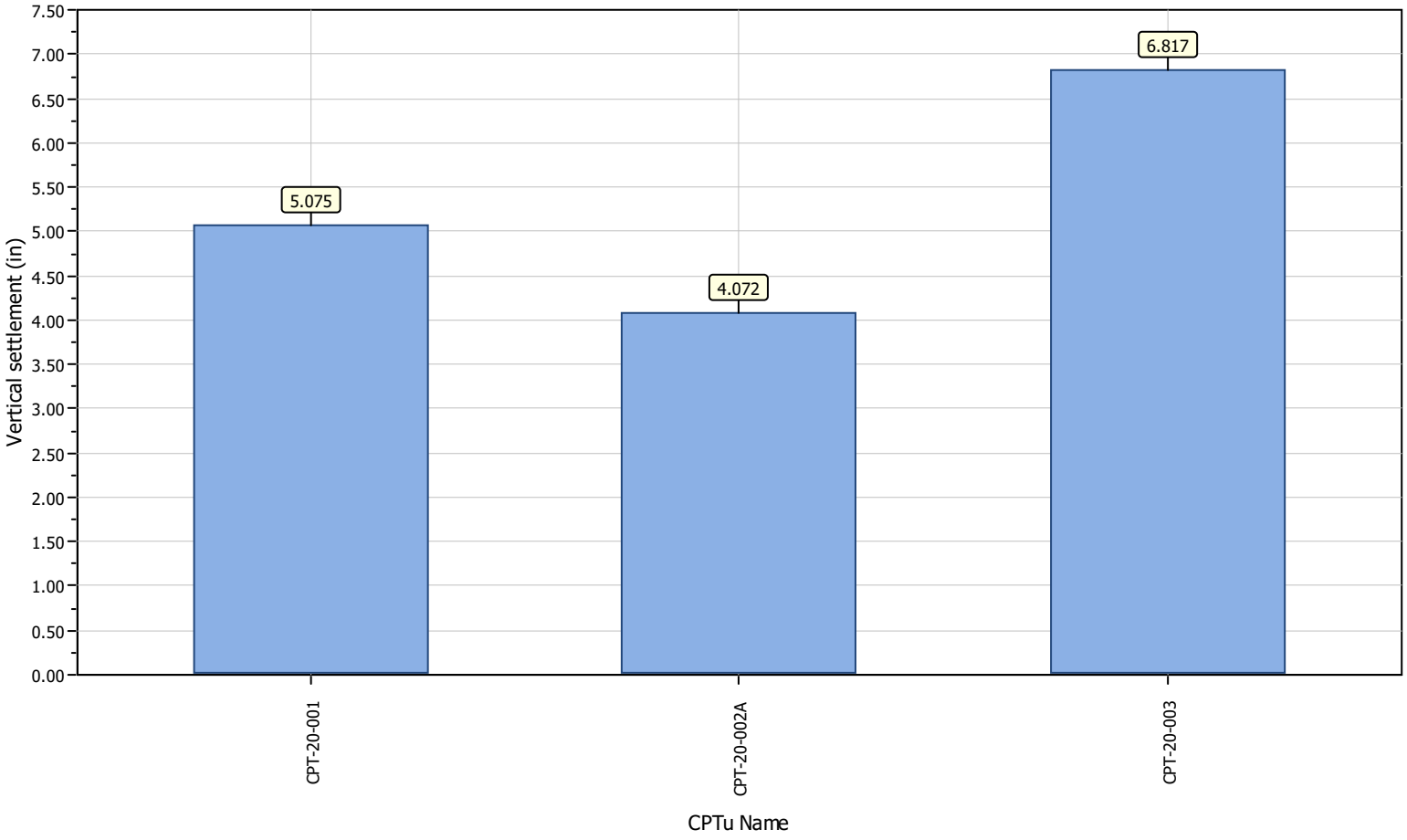


FIG. 13.—Relationship between Volumetric Strain, Shear Strain, and Penetration Resistance for Dry Sands

Project title : Camino Del Mar Bridge Replacement

Location : Del Mar, CA

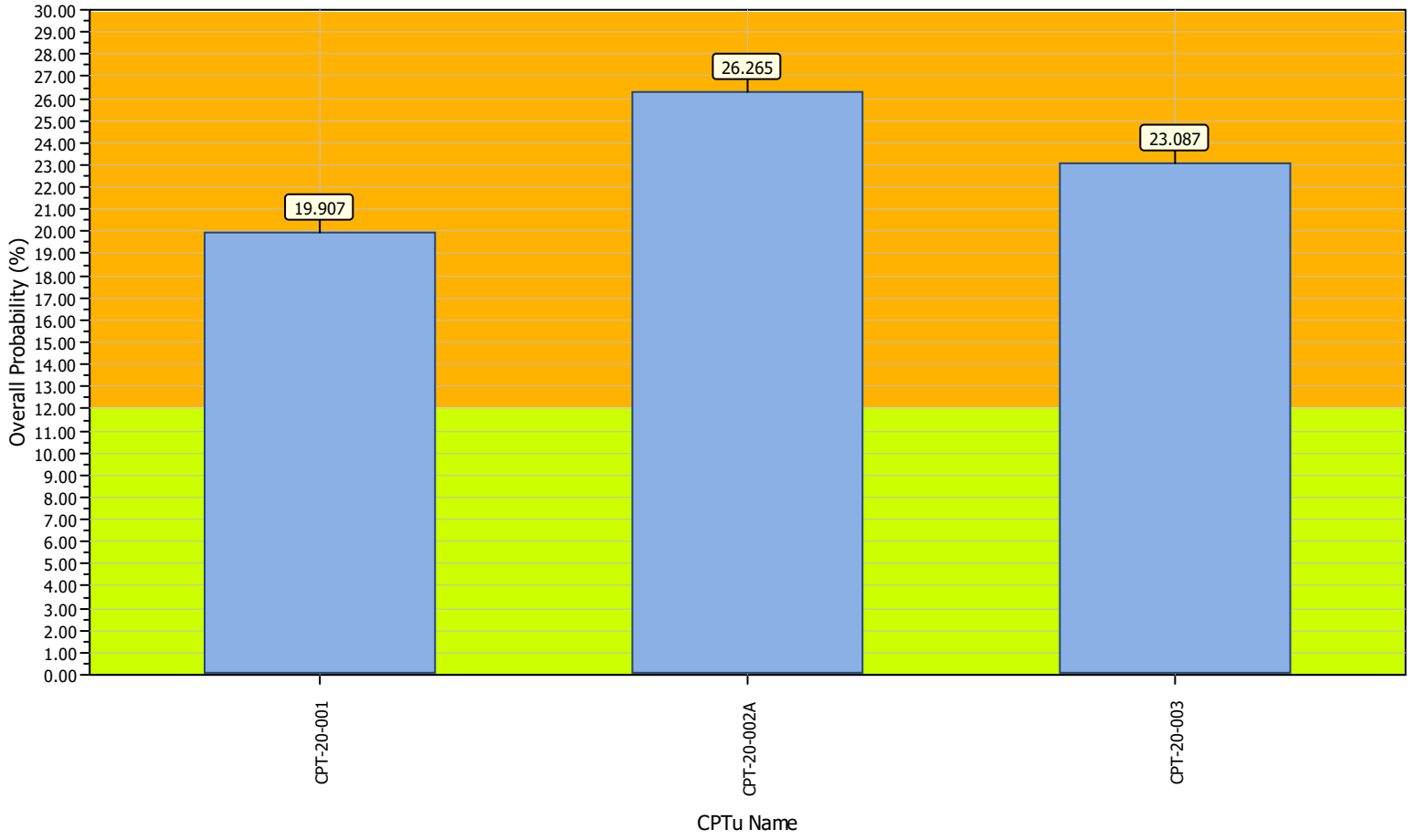
Overall vertical settlements report



Project title : Camino Del Mar Bridge Replacement

Location : Del Mar, CA

Overall Probability for Liquefaction report



Probability color scheme

- Very High Probability
- High Probability
- Low Probability

Basic statistics

Total CPT number: 3

0% low probability

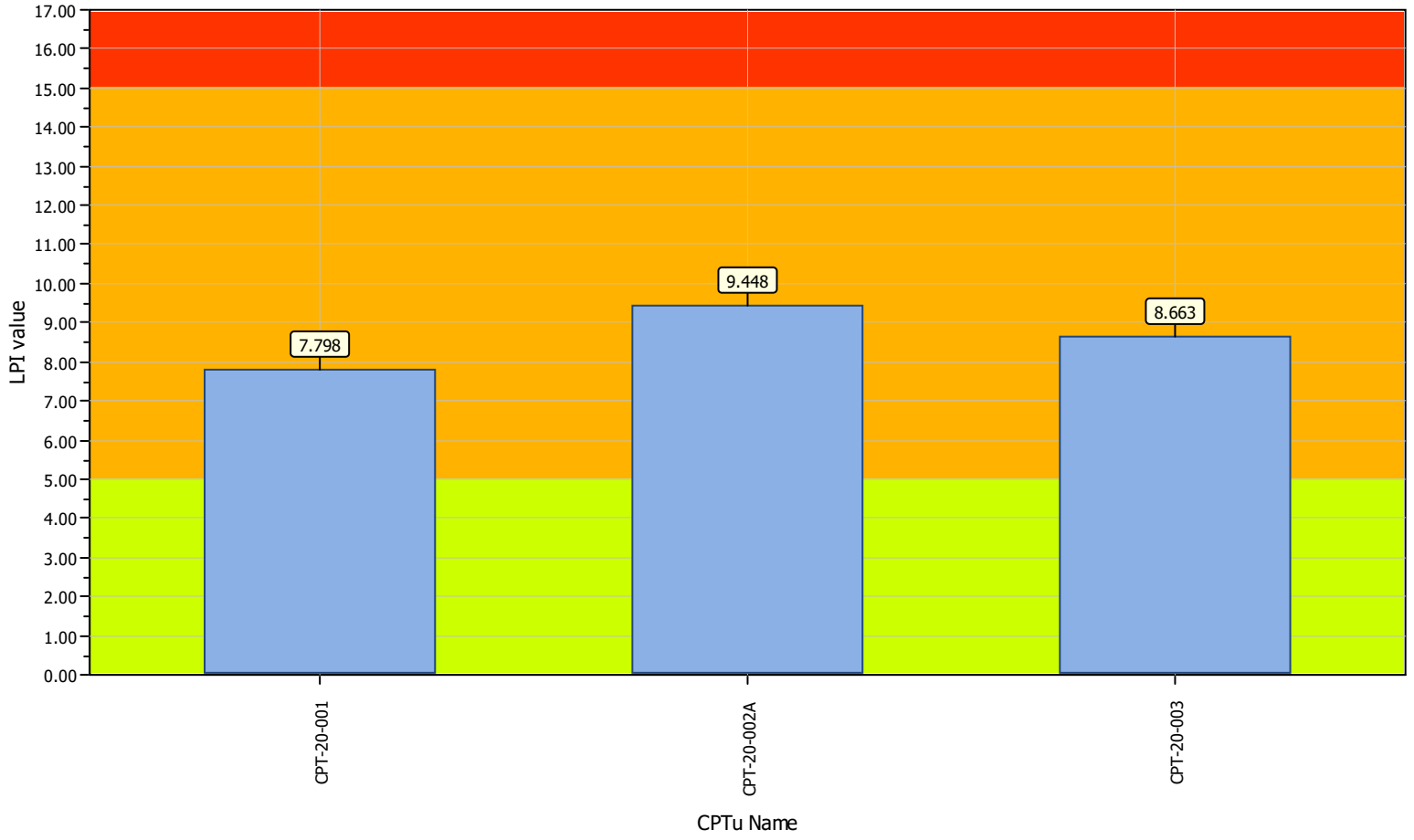
100% high probability

0% very high probability

Project title : Camino Del Mar Bridge Replacement

Location : Del Mar, CA

Overall Liquefaction Potential Index report



LPI color scheme

- Very high risk
- High risk
- Low risk

Basic statistics

Total CPT number: 3

0% low risk

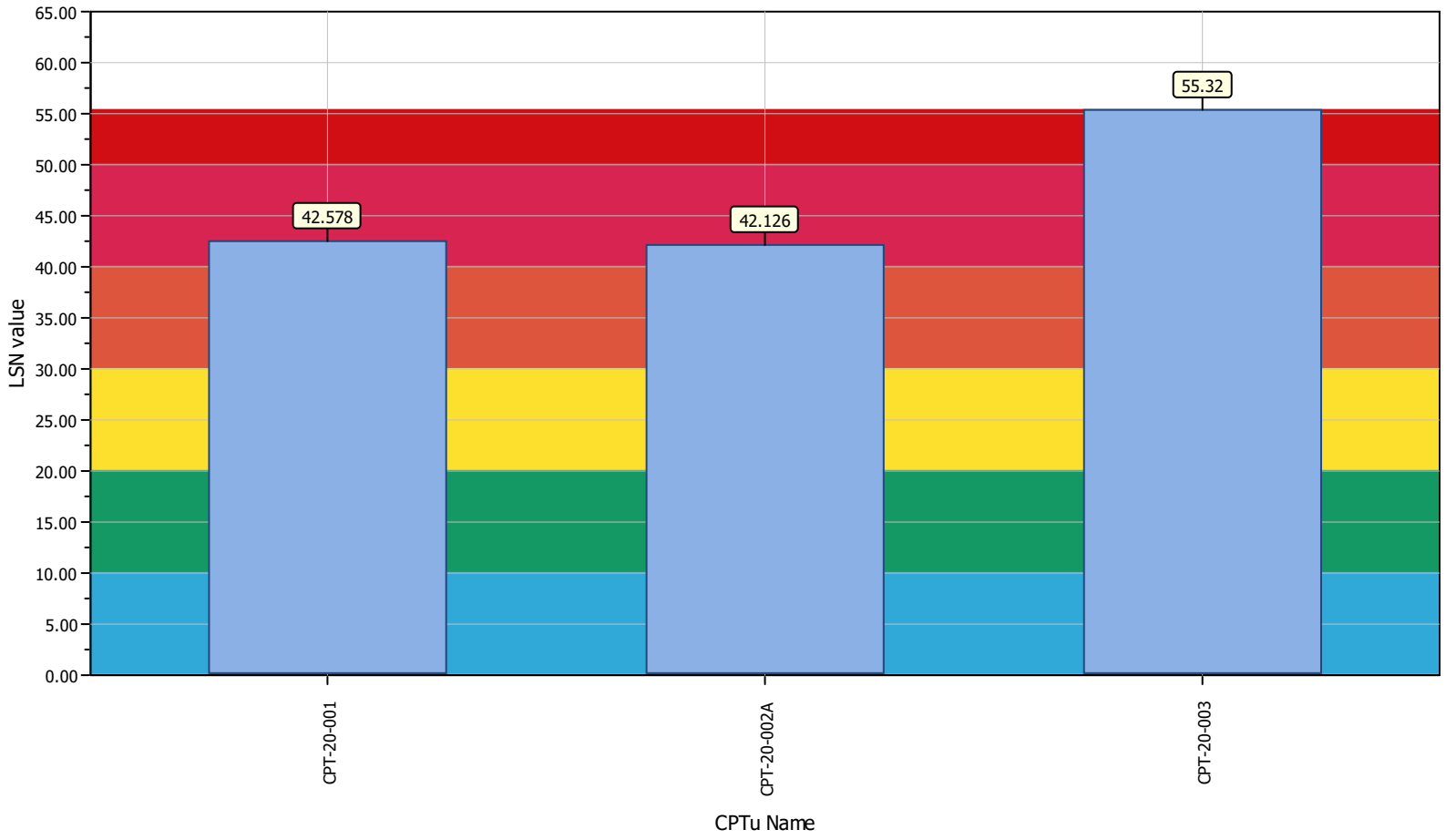
100% high risk

0% very high risk

Project title : Camino Del Mar Bridge Replacement

Location : Del Mar, CA

Overall Liquefaction Severity Number report



LSN color scheme

- Severe damage
- Major expression of liquefaction
- Moderate to severe exp. of liquefaction
- Moderate expression of liquefaction
- Minor expression of liquefaction
- Little to no expression of liquefaction

Basic statistics

Total CPT number: 3

0% little liquefaction

0% minor liquefaction

0% moderate liquefaction

0% moderate to major liquefaction

67% major liquefaction

33% severe liquefaction

GEOLOGISMIKI Geotechnical Software

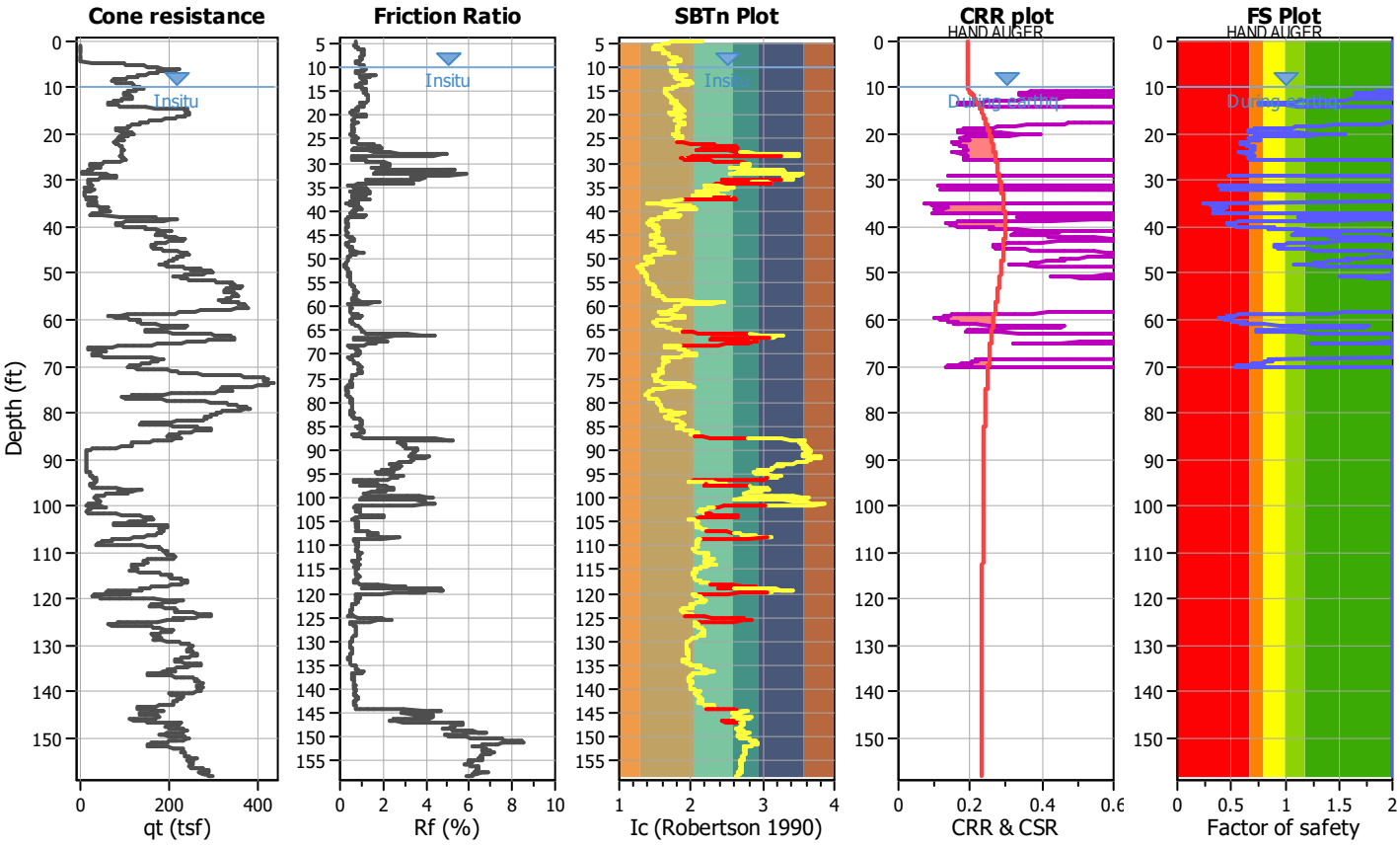
LIQUEFACTION ANALYSIS REPORT

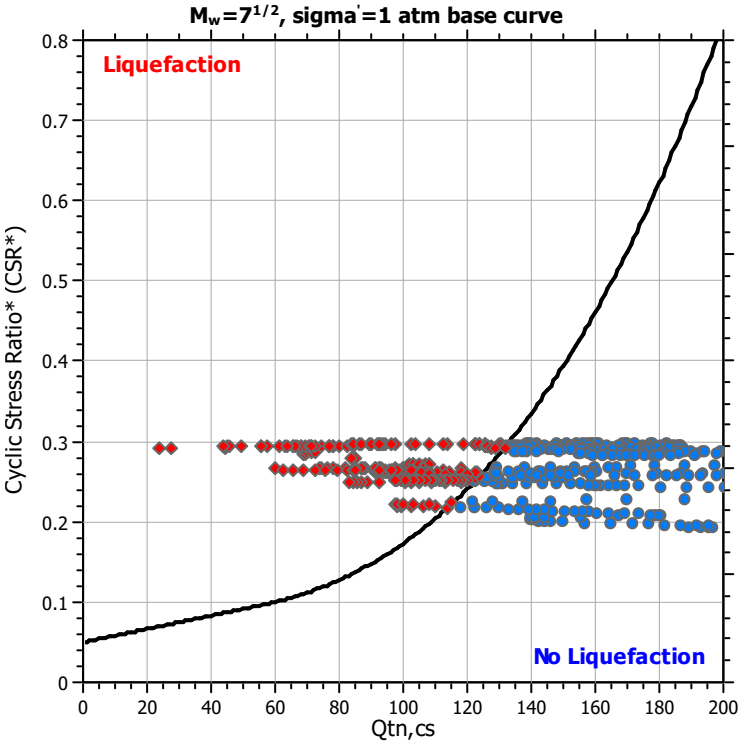
Project title : Camino Del Mar Bridge Replacement **Location : Del Mar, CA**

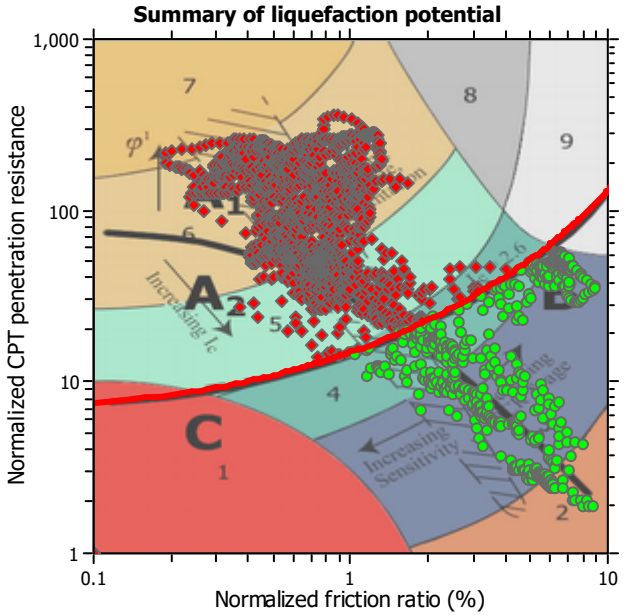
CPT file : CPT-20-001

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	70.00 ft
Earthquake magnitude M_w:	6.63	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.41	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

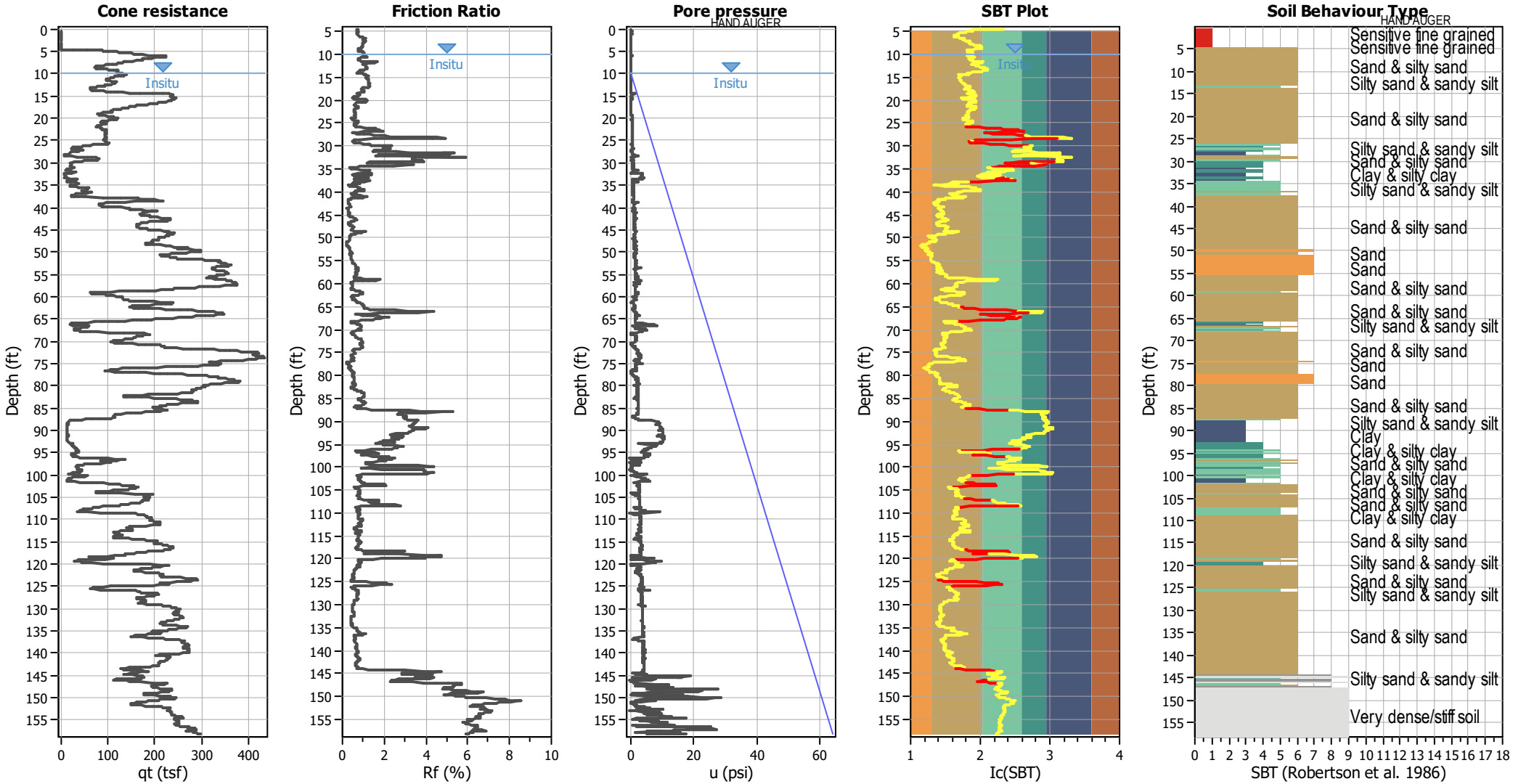






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



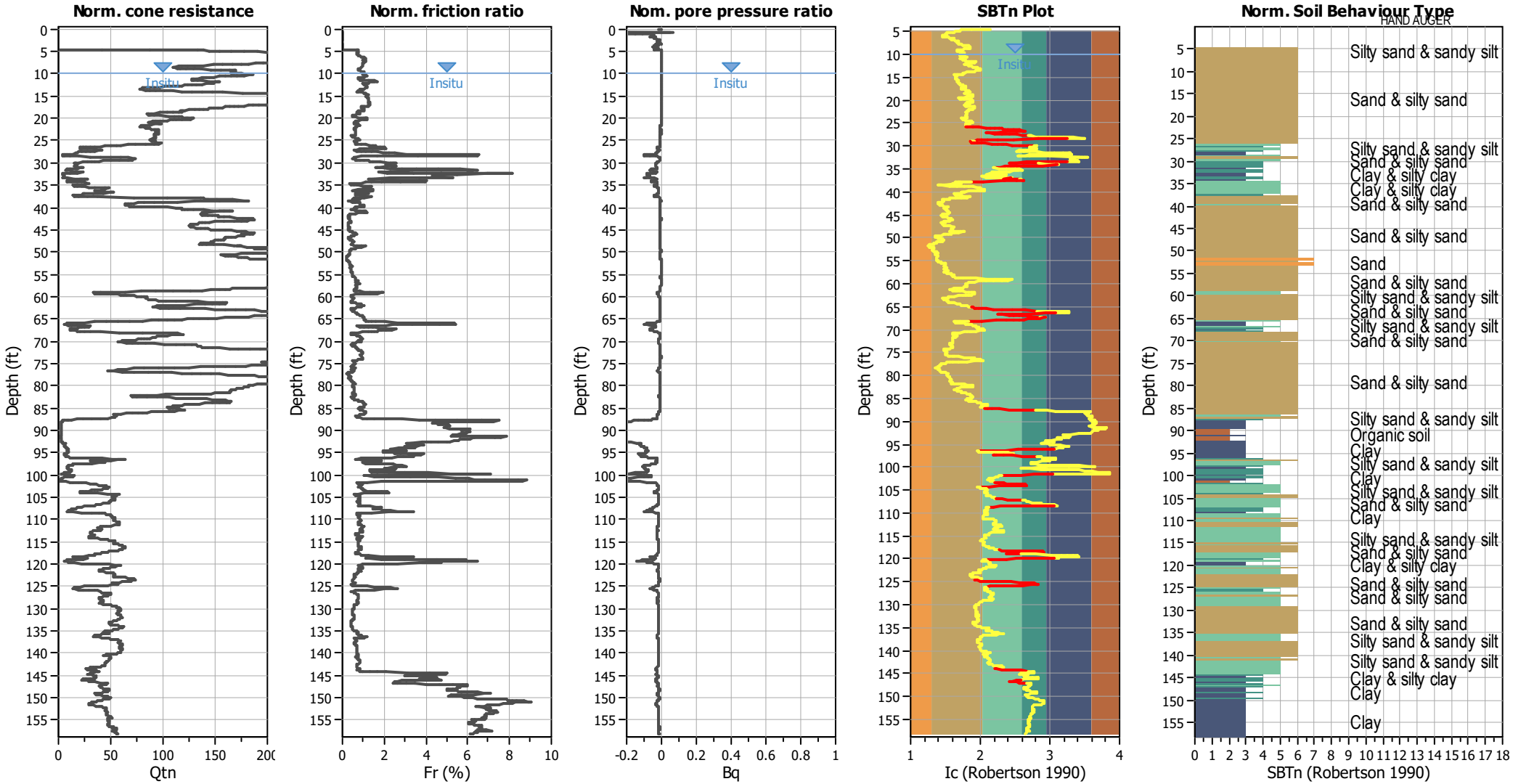
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



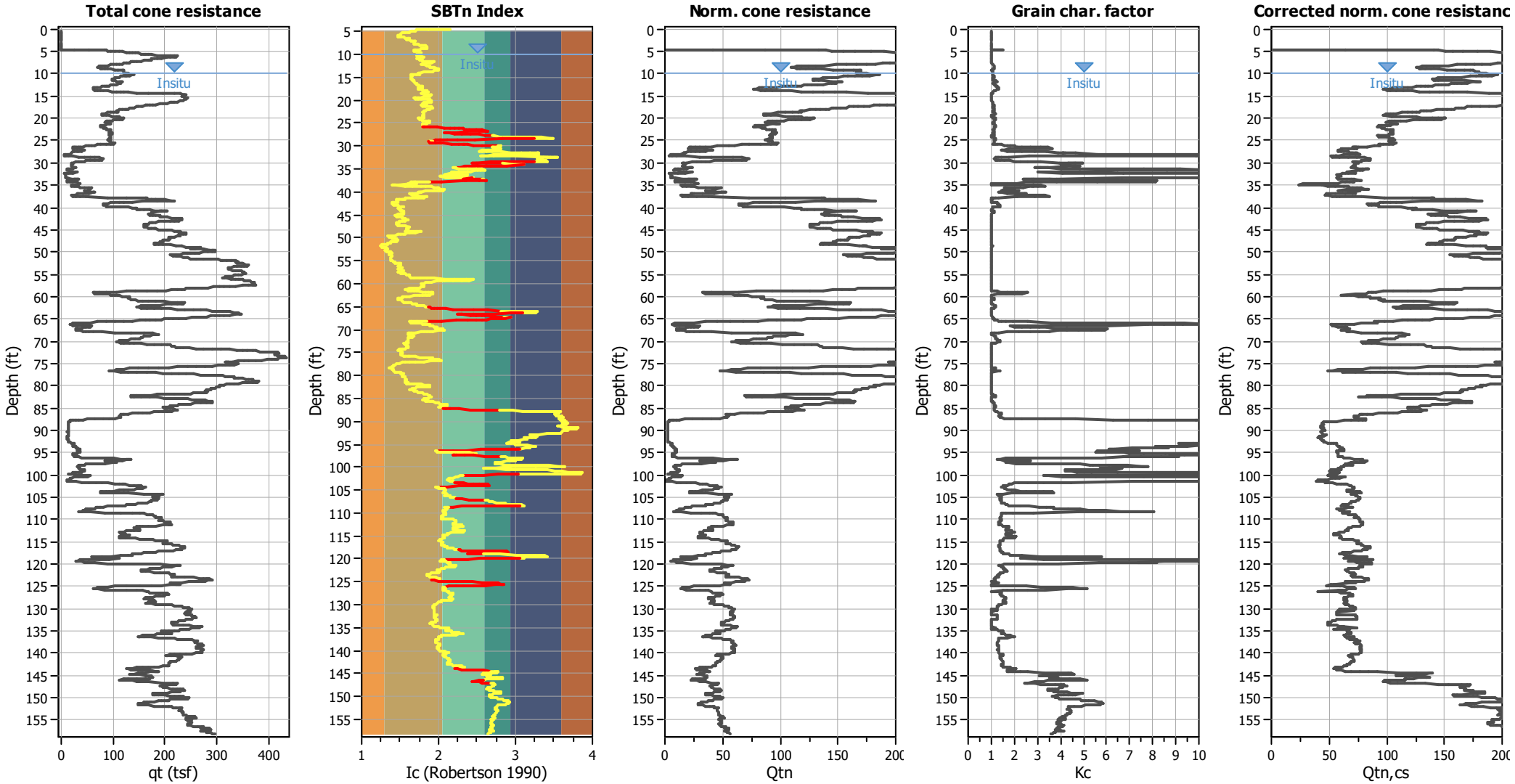
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

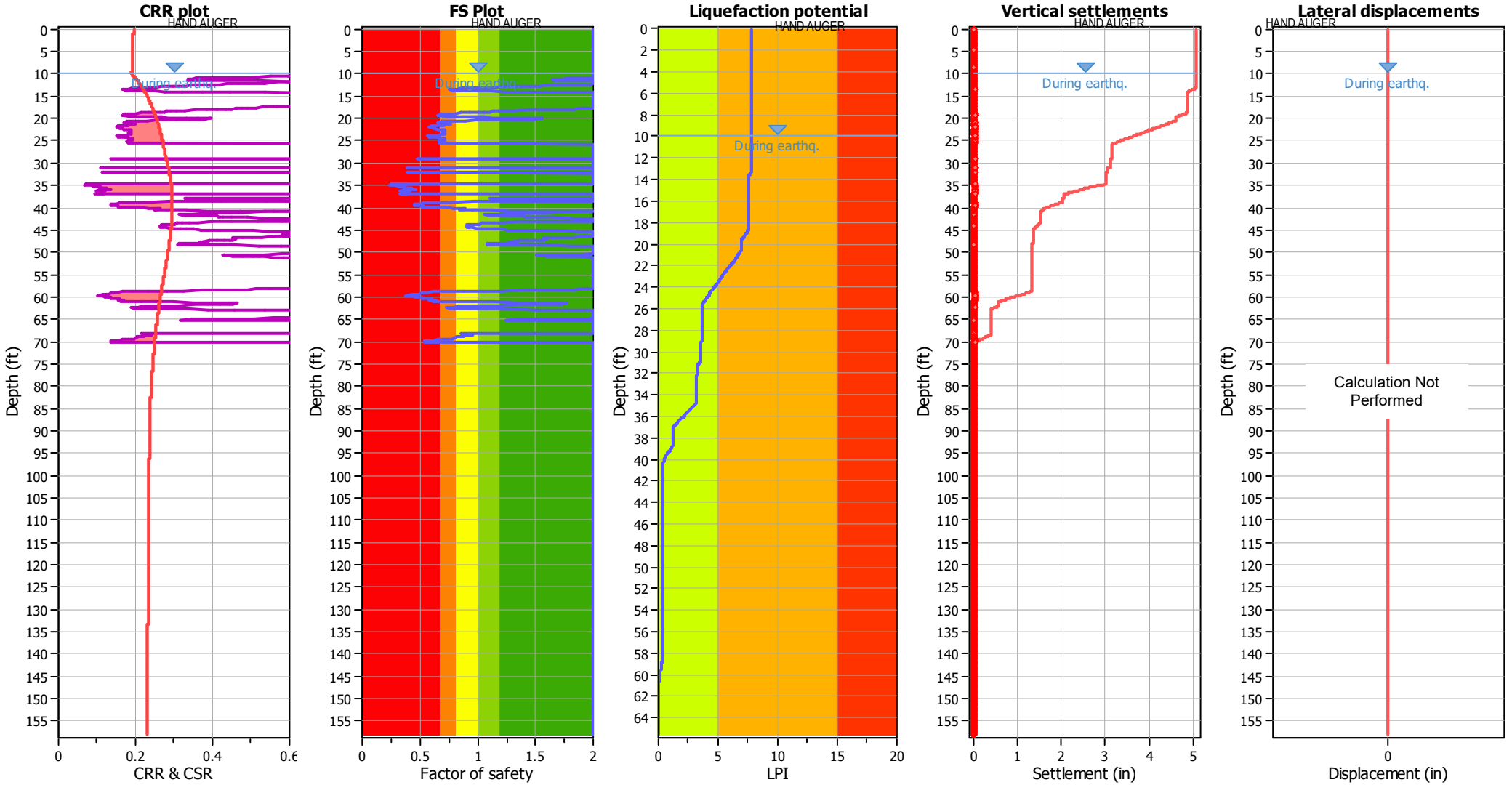
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

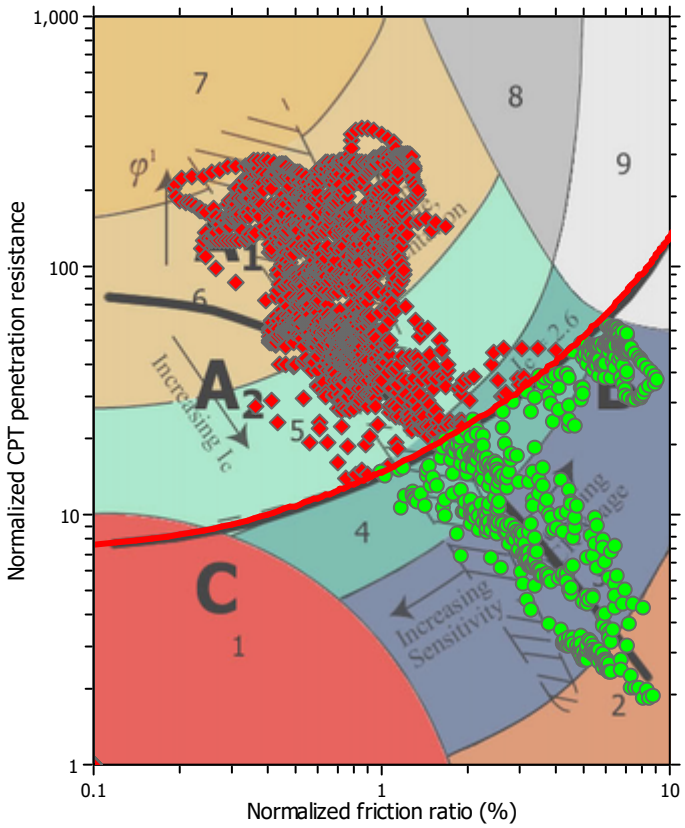
F.S. color scheme

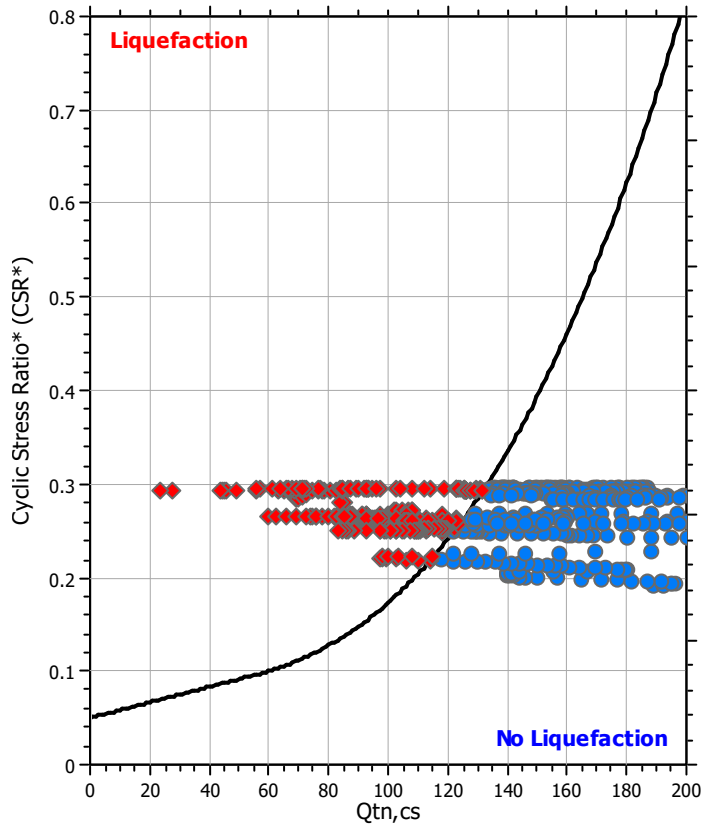
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

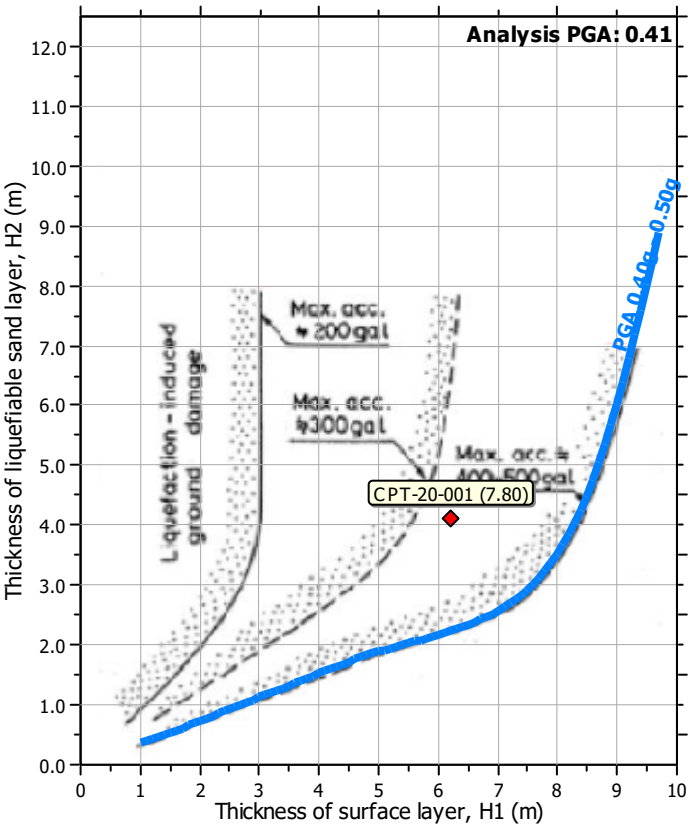
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



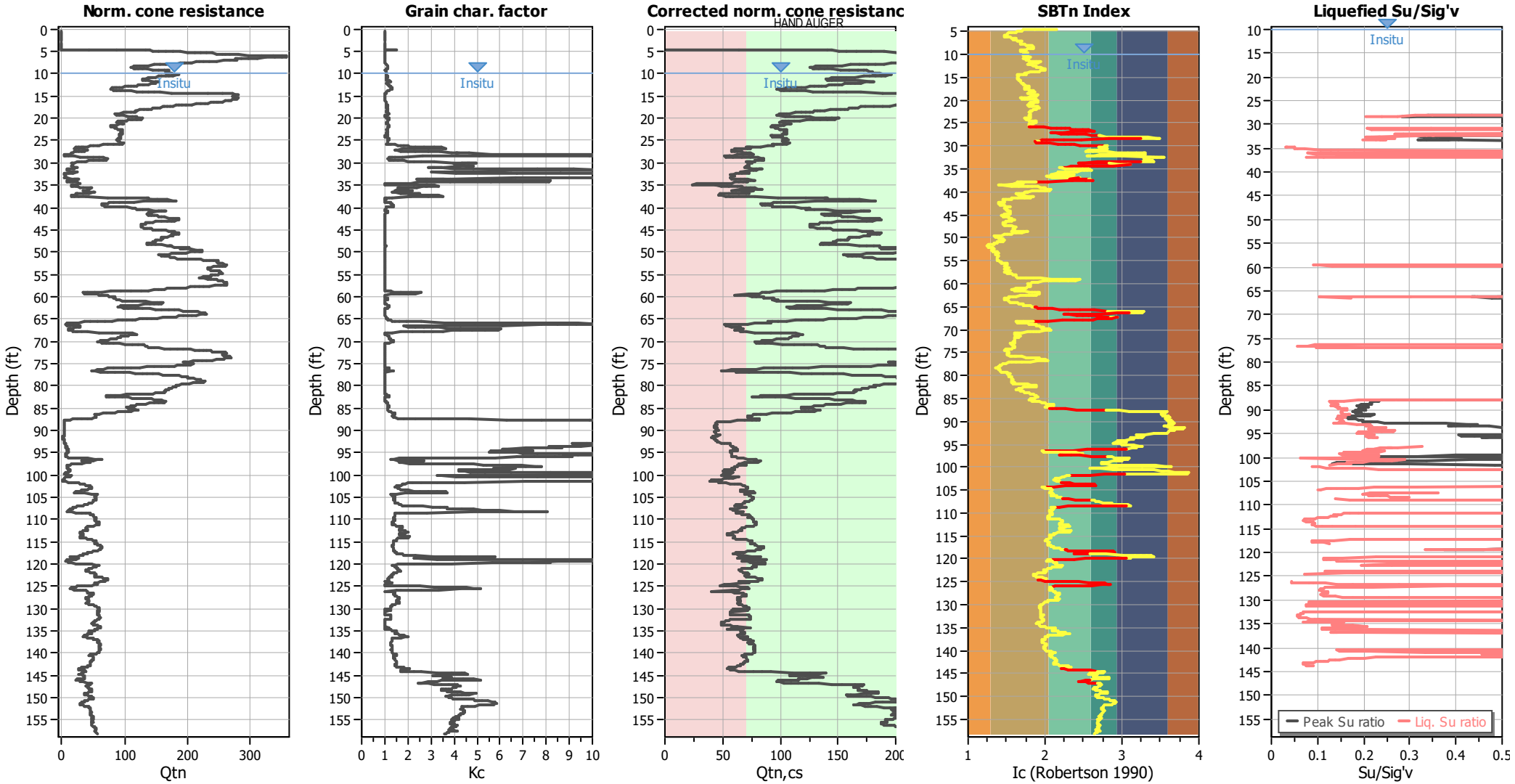




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

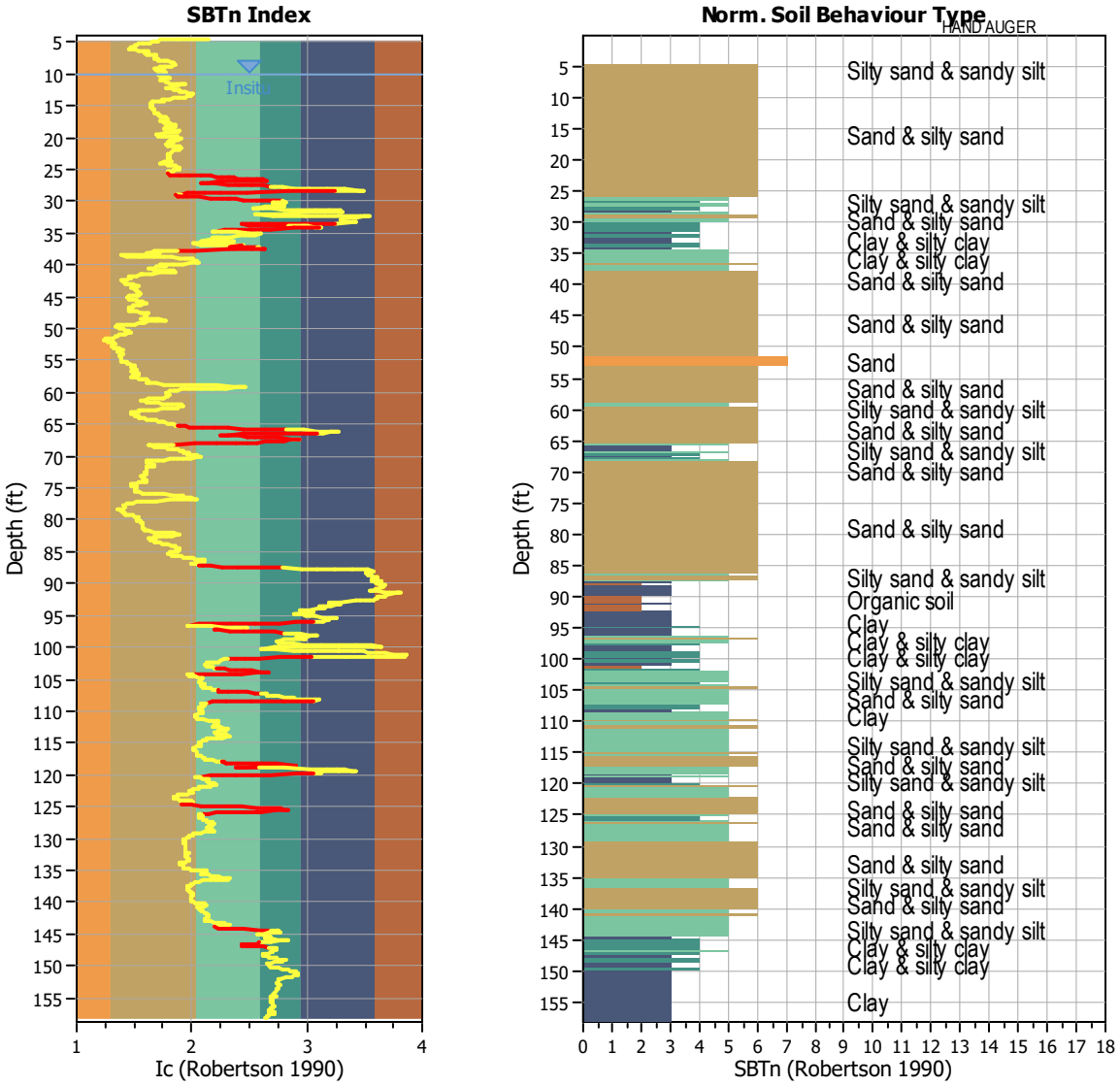
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

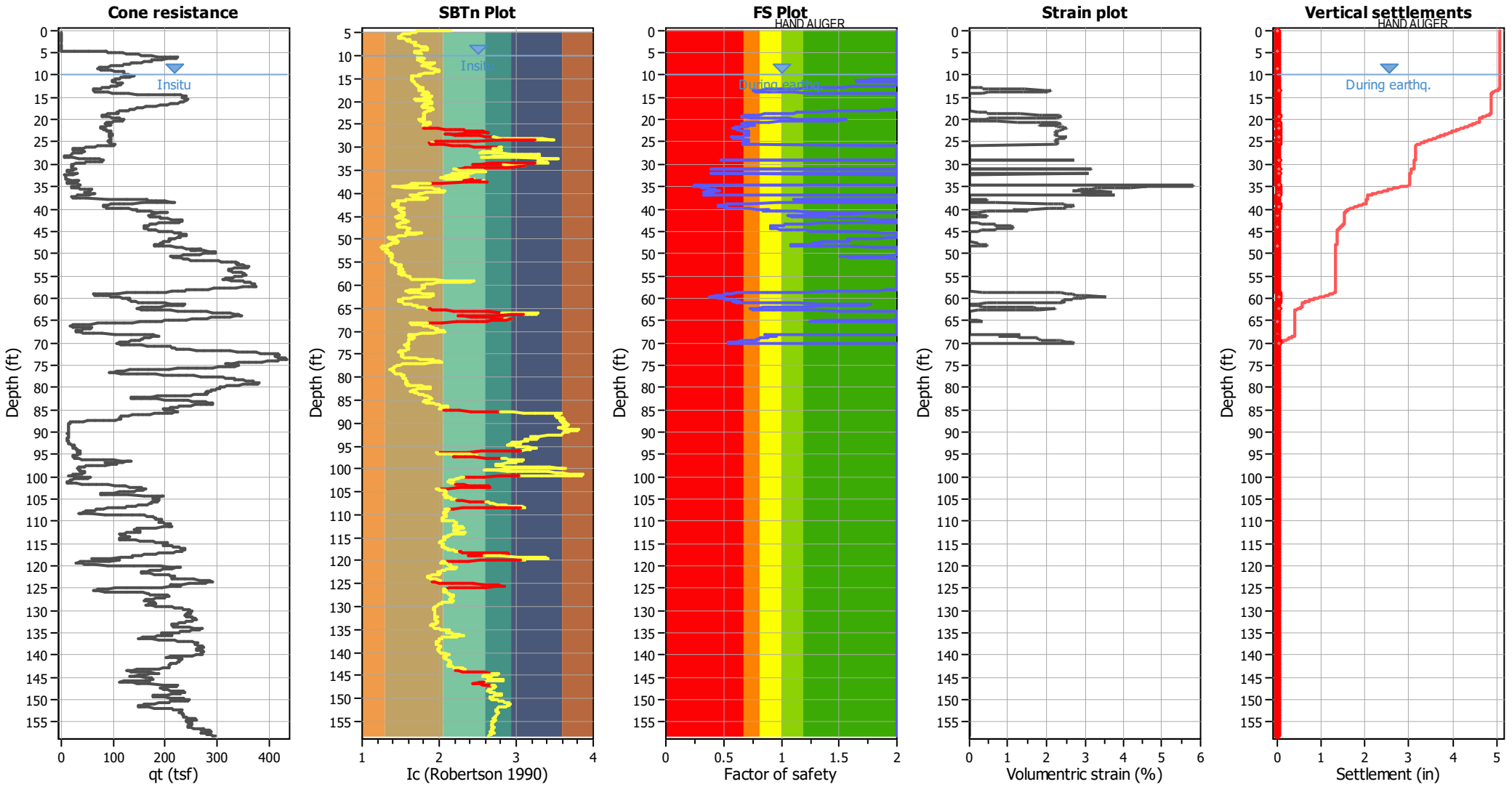
The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties		General statistics	
I_c minimum check value:	1.70	Total points in CPT file:	2411
I_c maximum check value:	3.00	Total points excluded:	254
I_c change ratio value:	0.0250	Exclusion percentage:	10.54%
Minimum number of points in layer:	4	Number of layers detected:	31

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

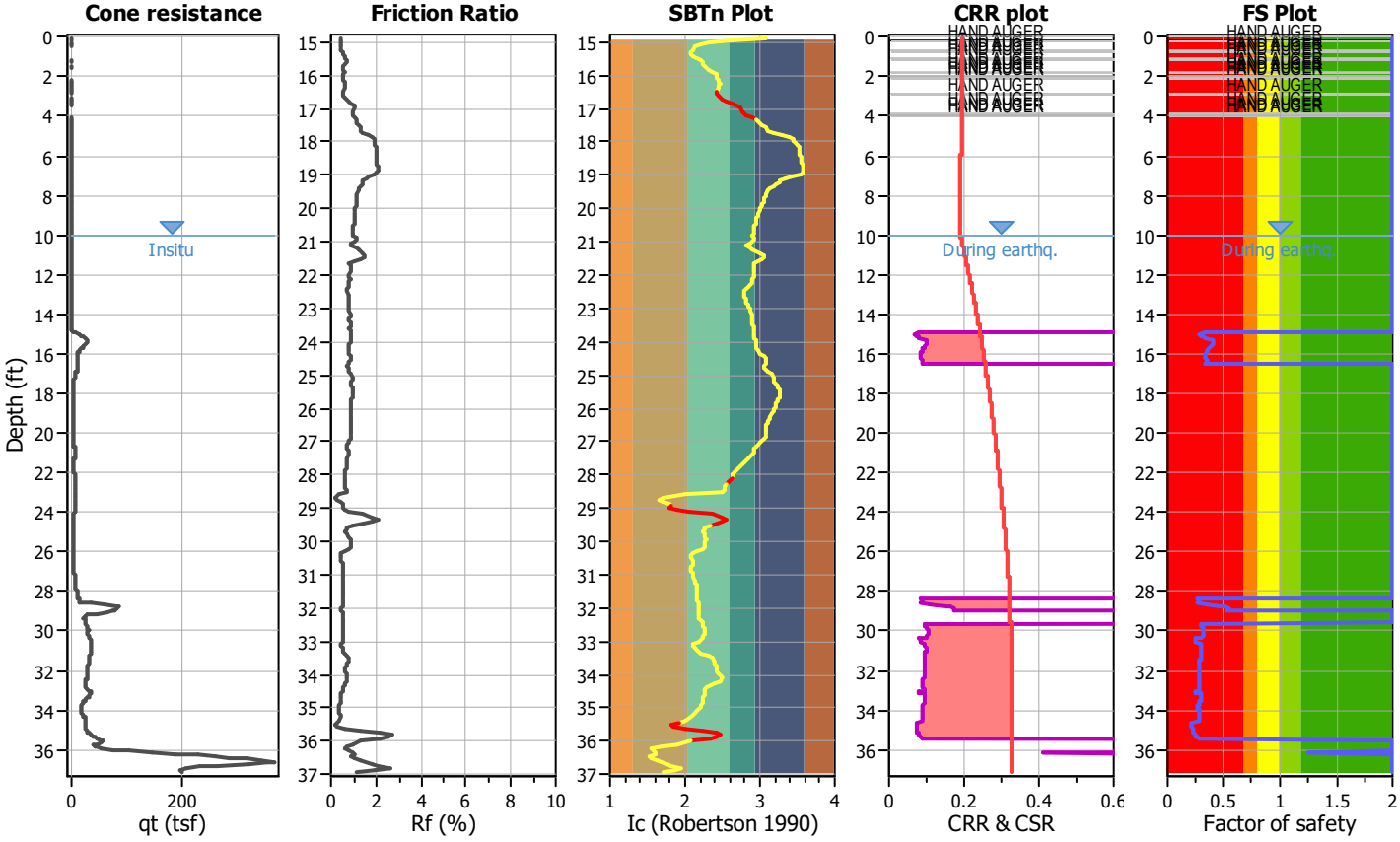
LIQUEFACTION ANALYSIS REPORT

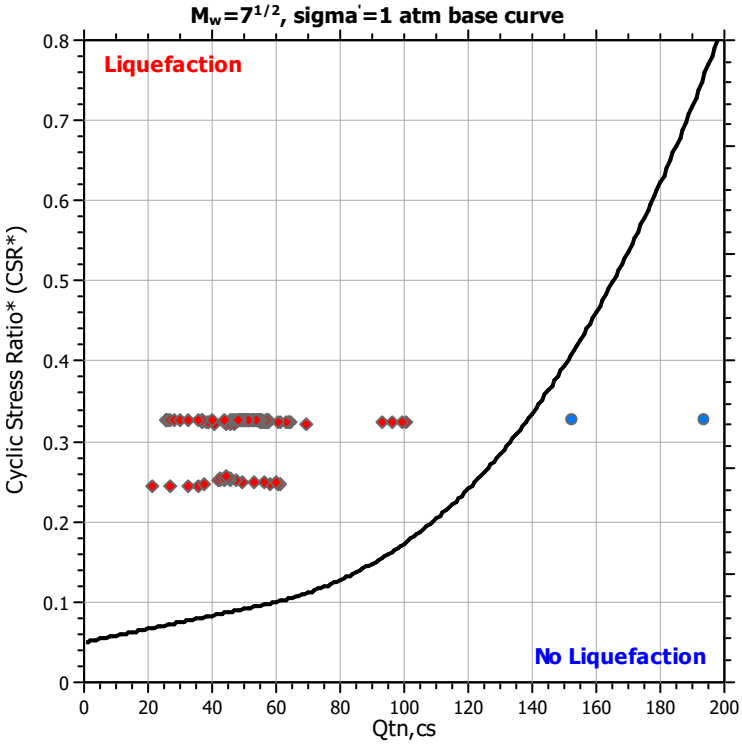
Project title : Camino Del Mar Bridge Replacement **Location : Del Mar, CA**

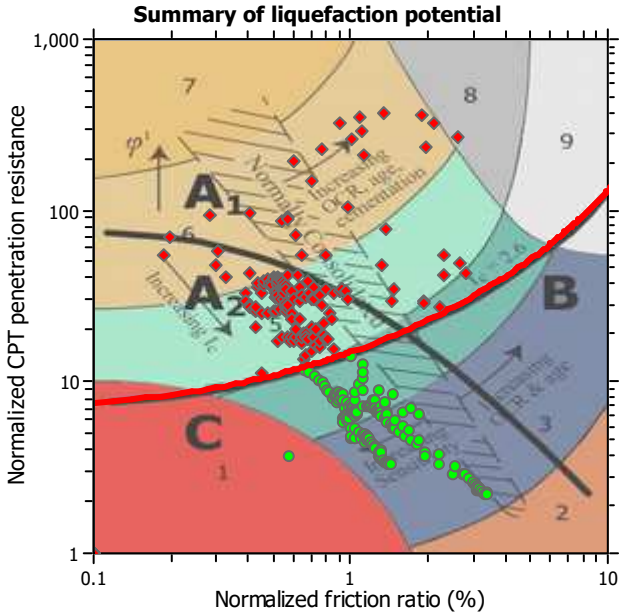
CPT file : CPT-20-002A

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	70.00 ft
Earthquake magnitude M_w:	6.63	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.41	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

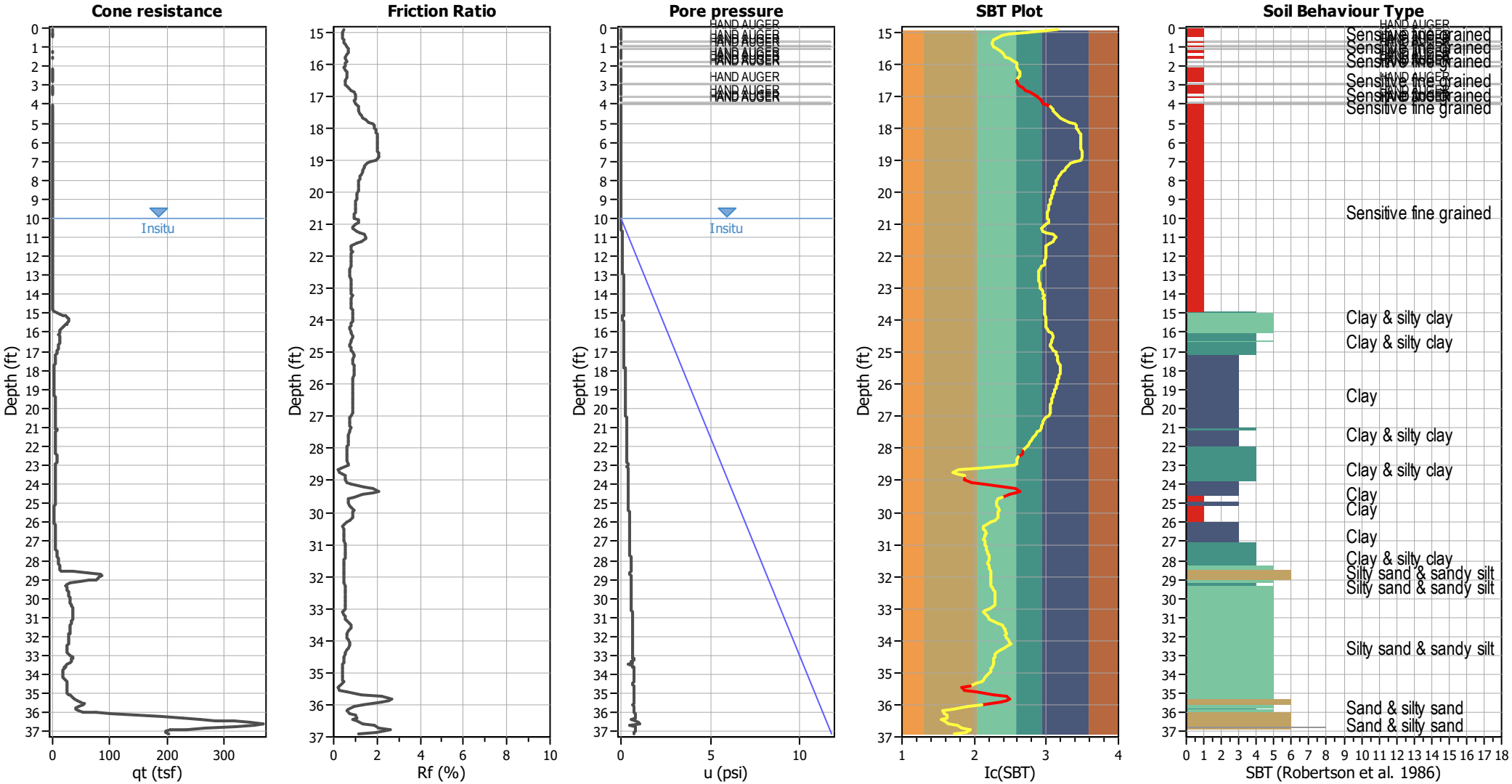






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



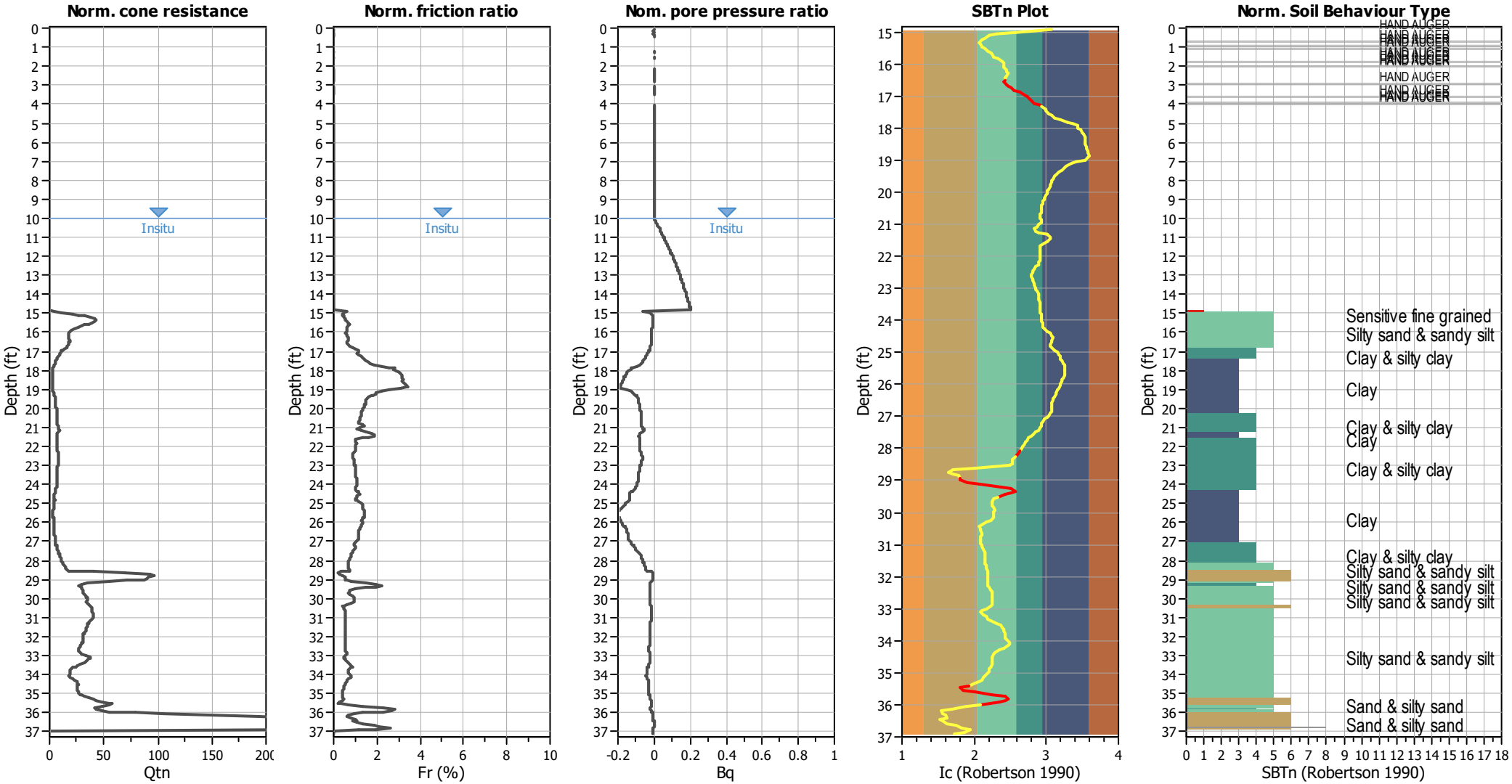
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



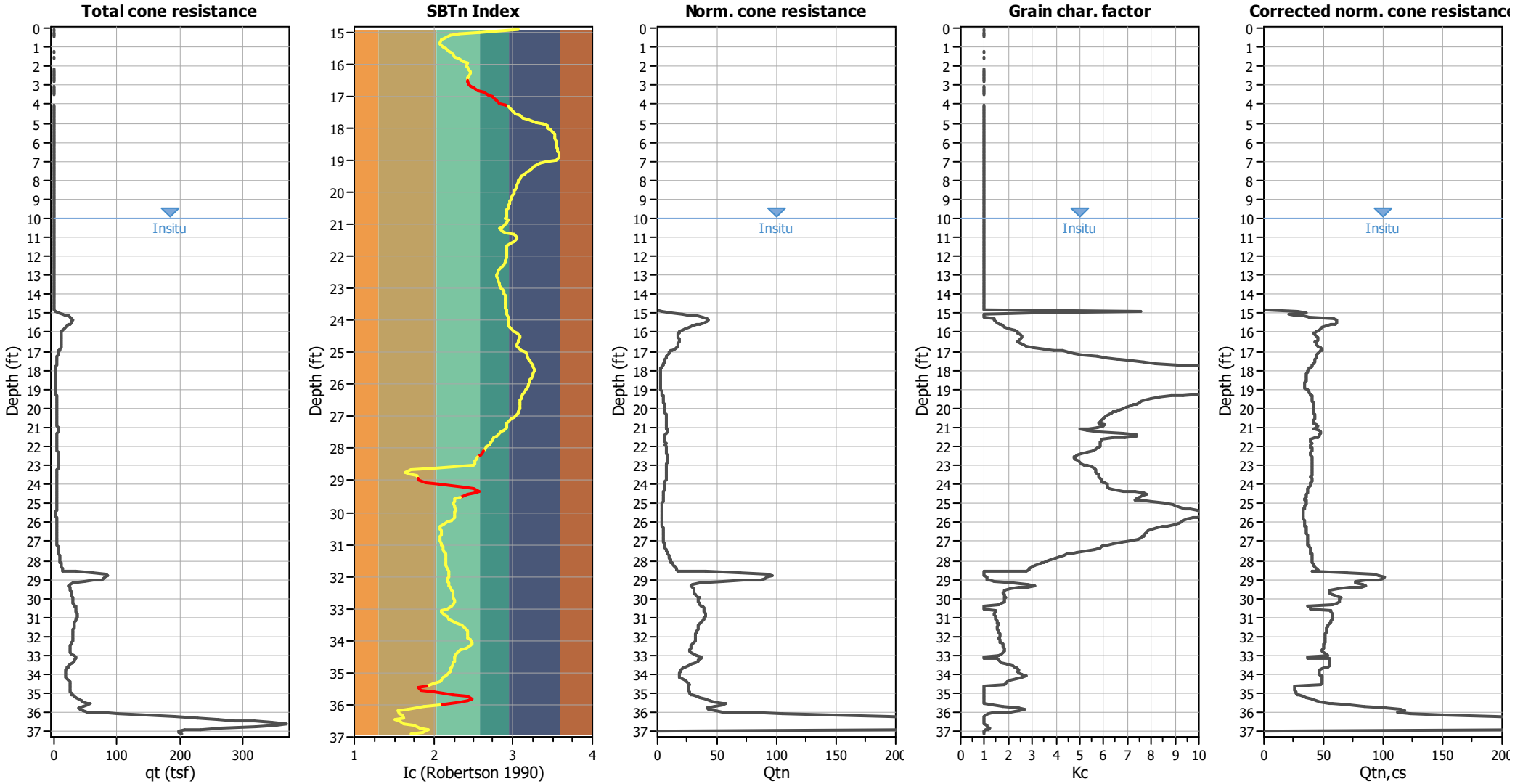
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

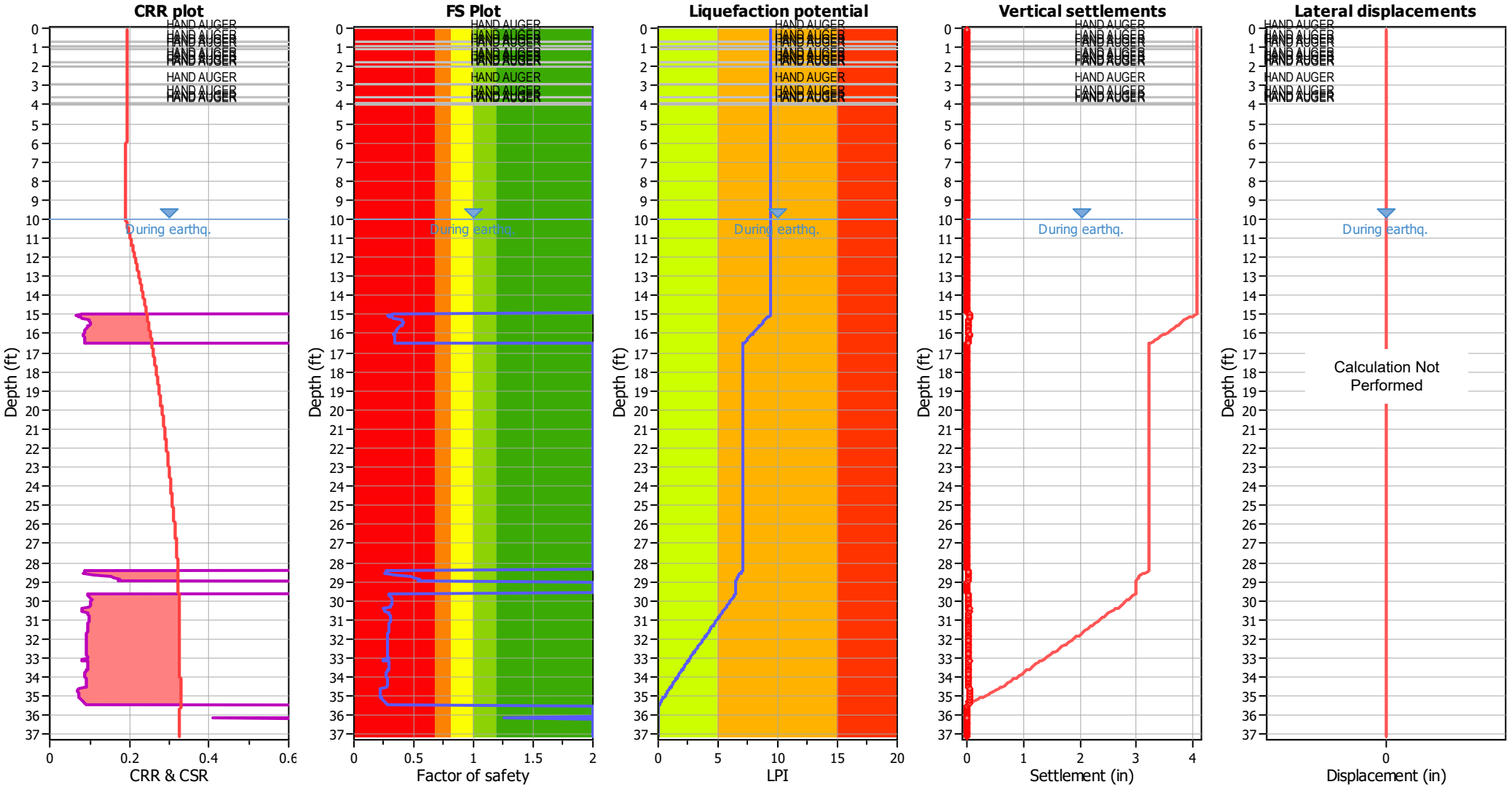
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

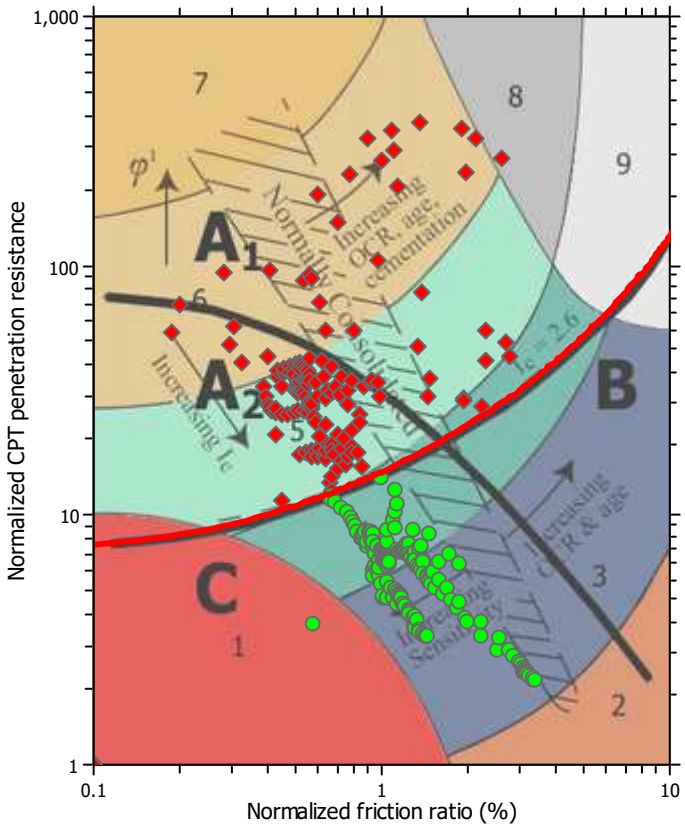
F.S. color scheme

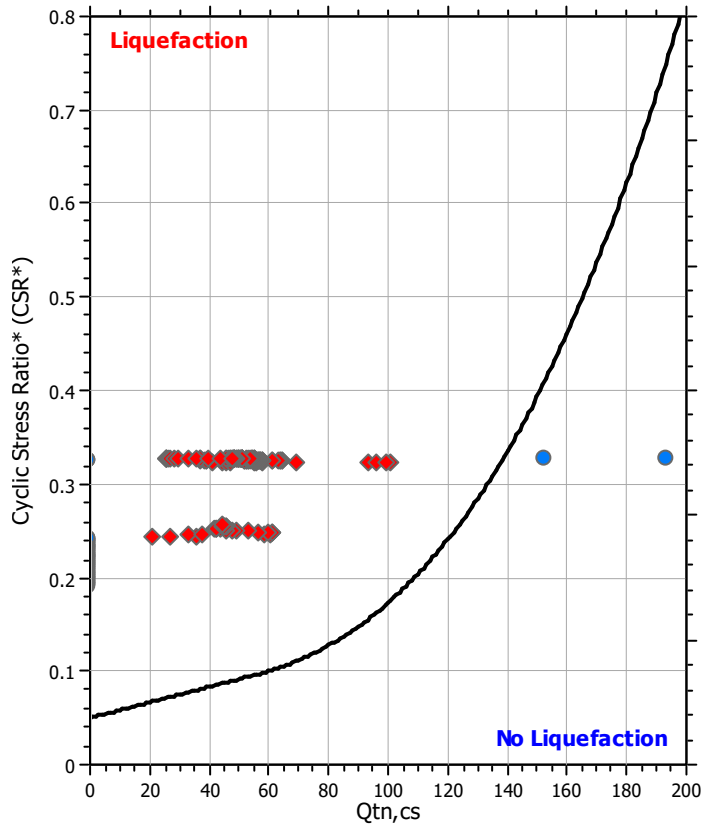
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

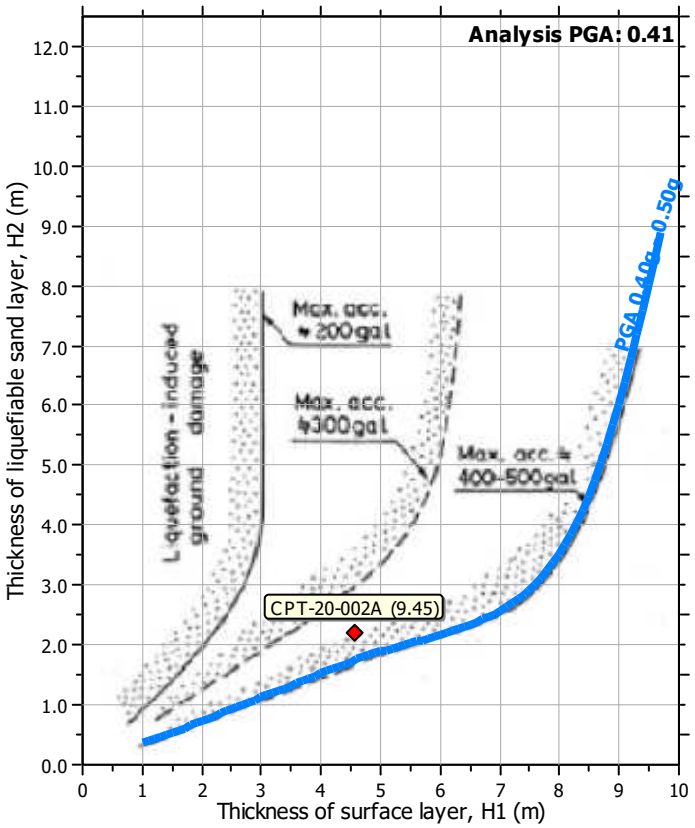
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



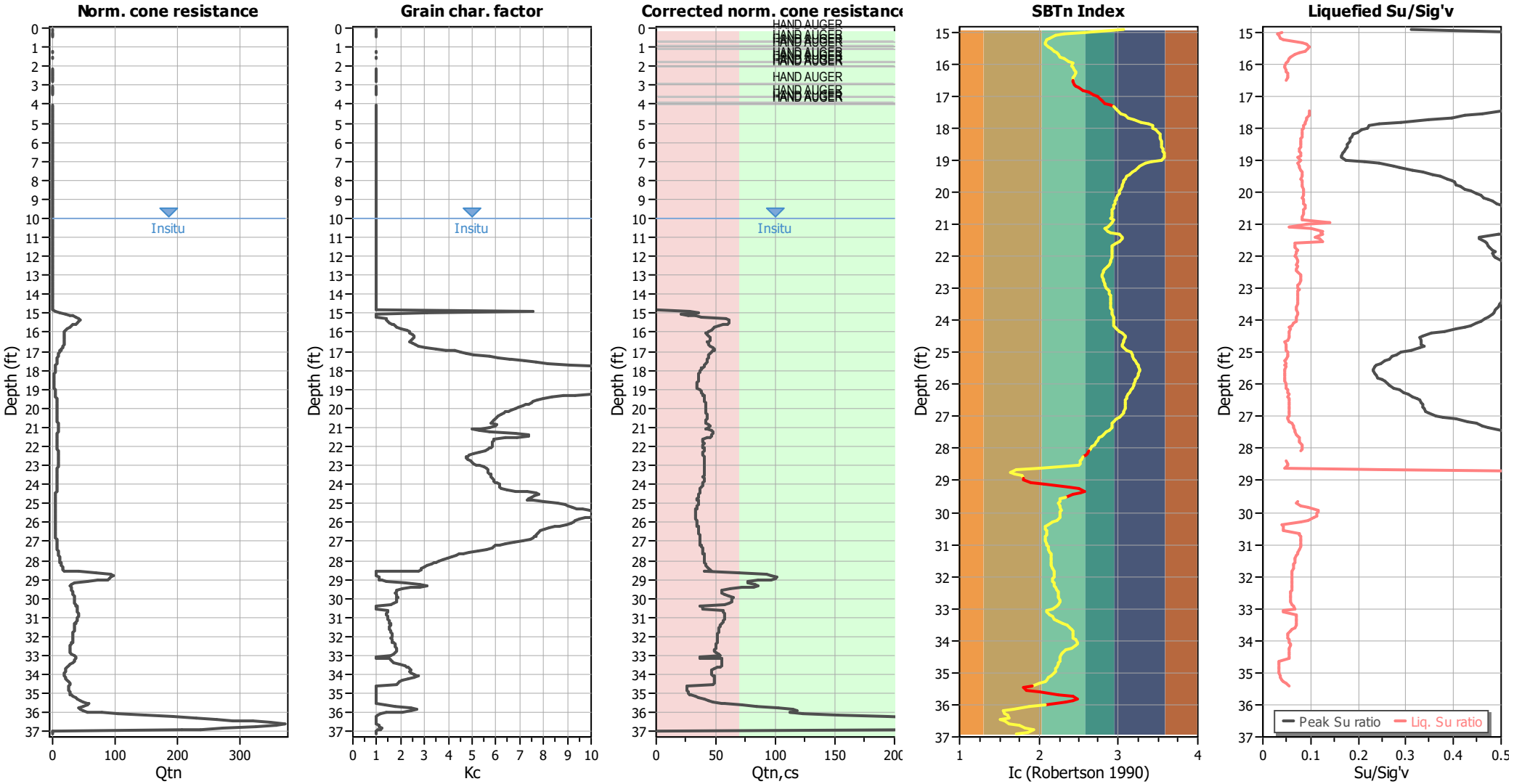




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

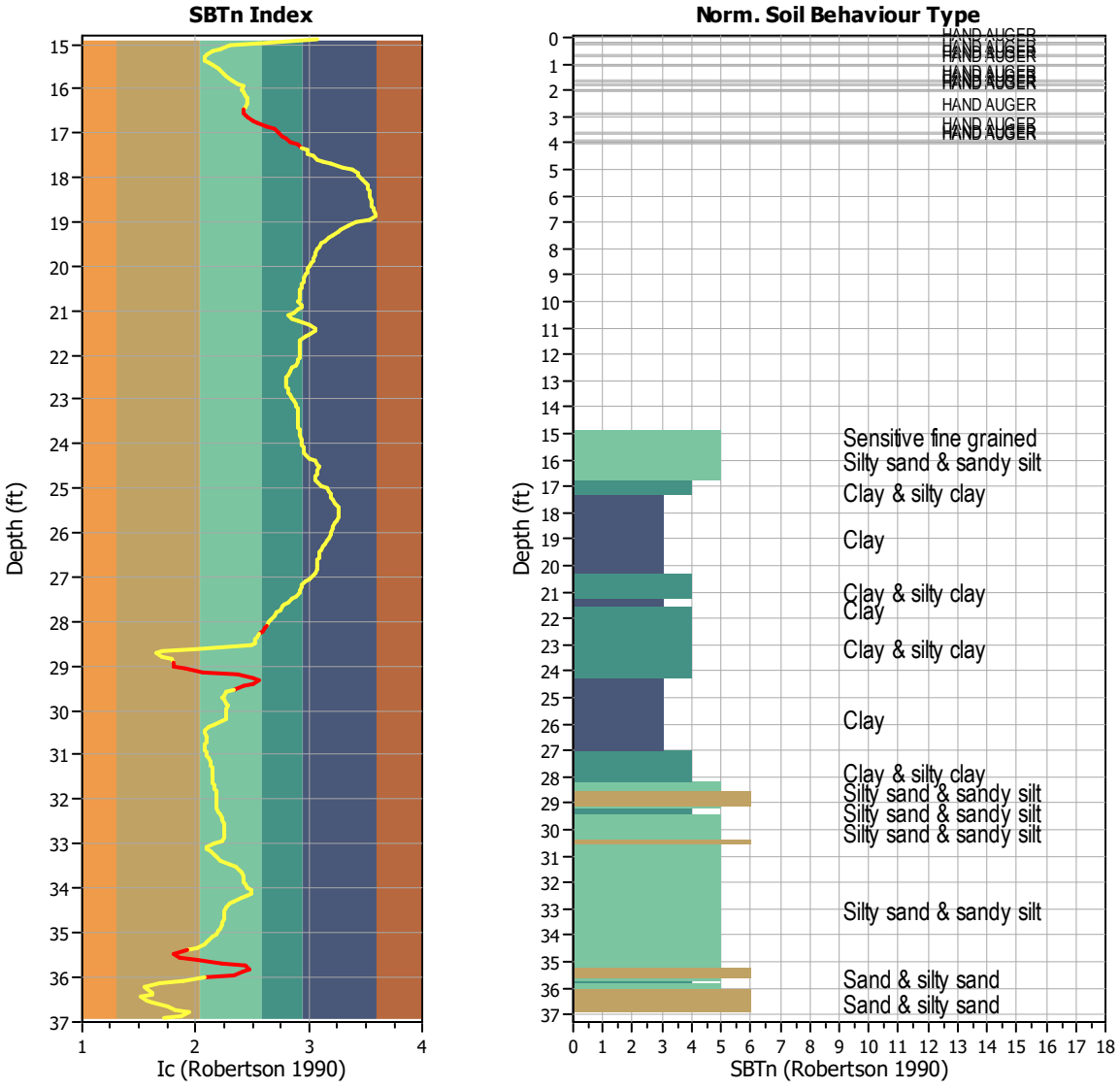
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

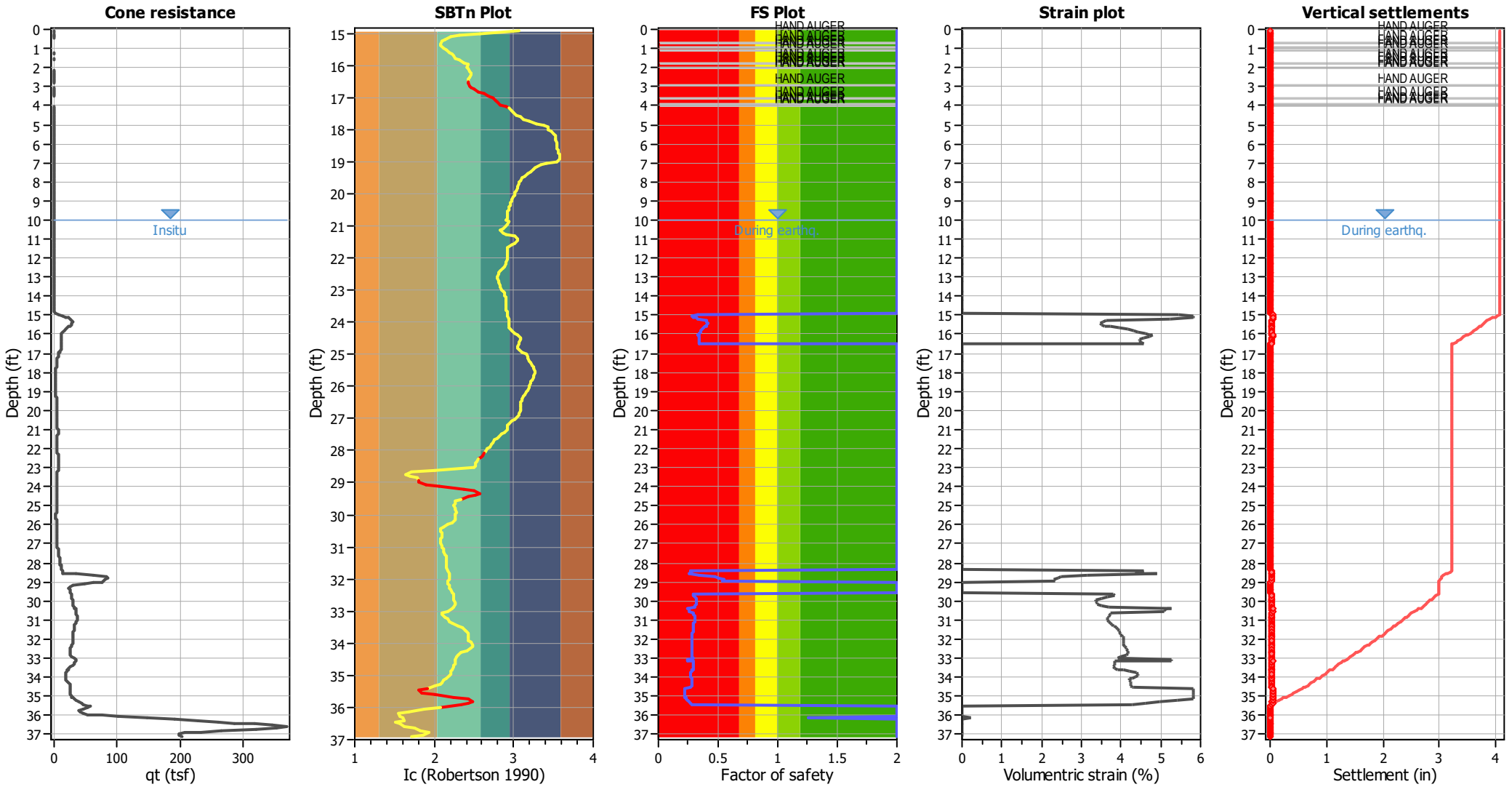
The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties		General statistics	
I_c minimum check value:	1.70	Total points in CPT file:	566
I_c maximum check value:	3.00	Total points excluded:	40
I_c change ratio value:	0.0250	Exclusion percentage:	7.07%
Minimum number of points in layer:	4	Number of layers detected:	6

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

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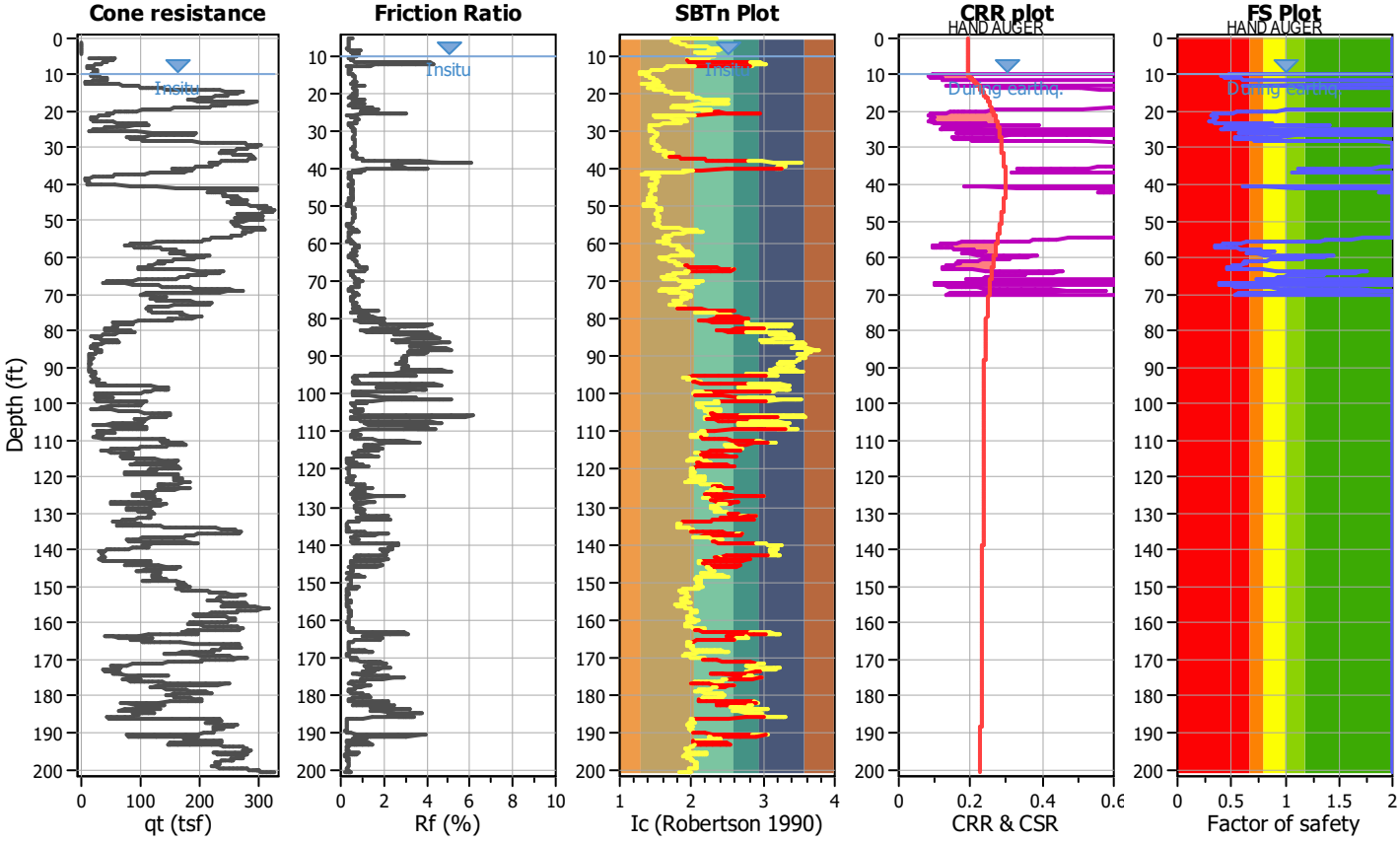
LIQUEFACTION ANALYSIS REPORT

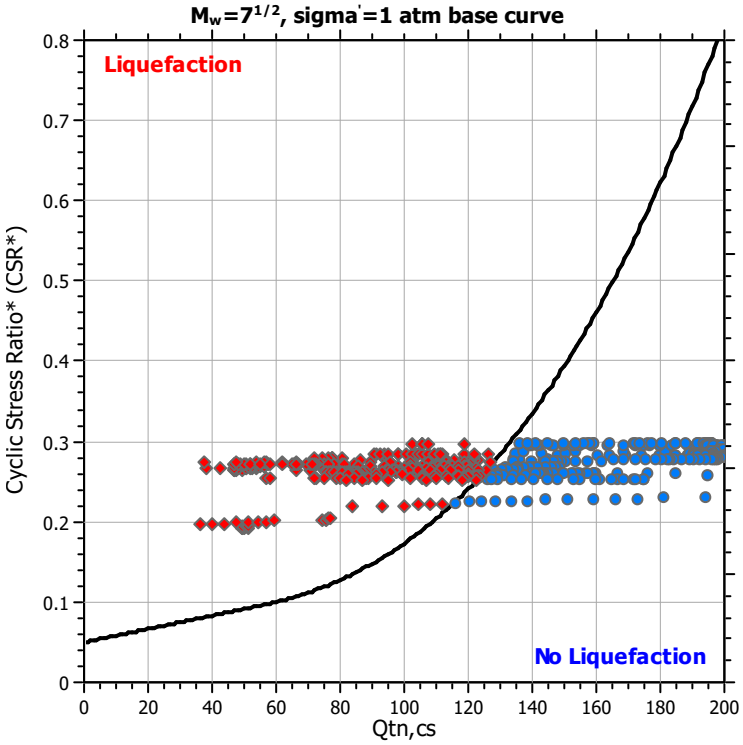
Project title : Camino Del Mar Bridge Replacement **Location : Del Mar, CA**

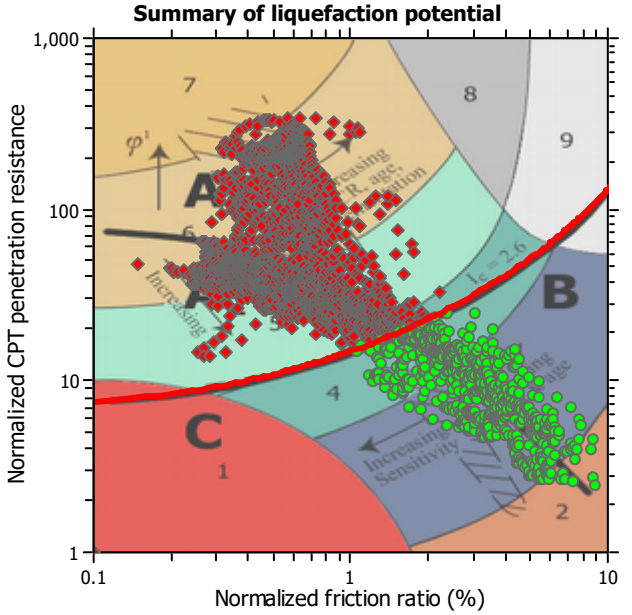
CPT file : CPT-20-003

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	70.00 ft
Earthquake magnitude M_w:	6.63	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.41	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

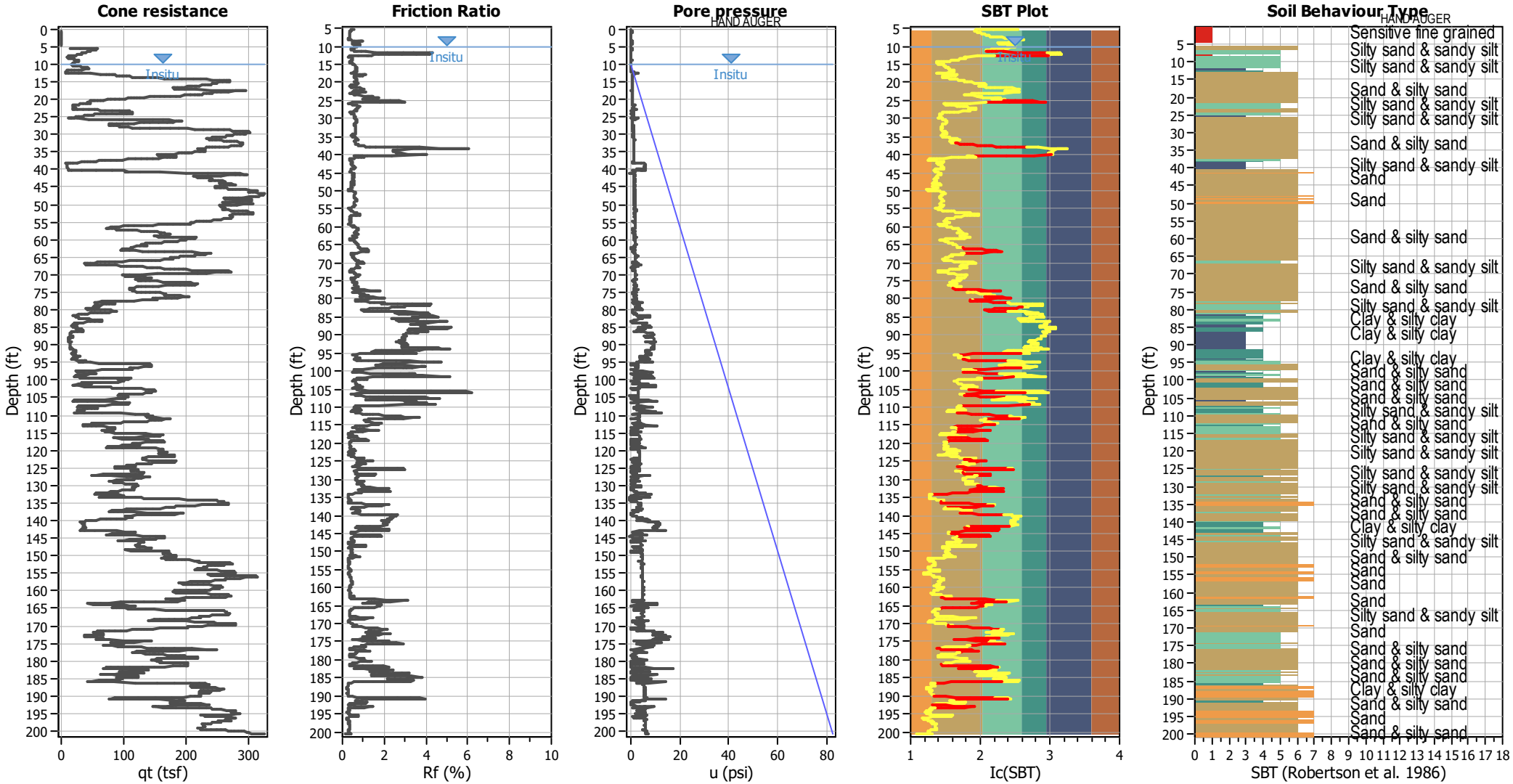






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



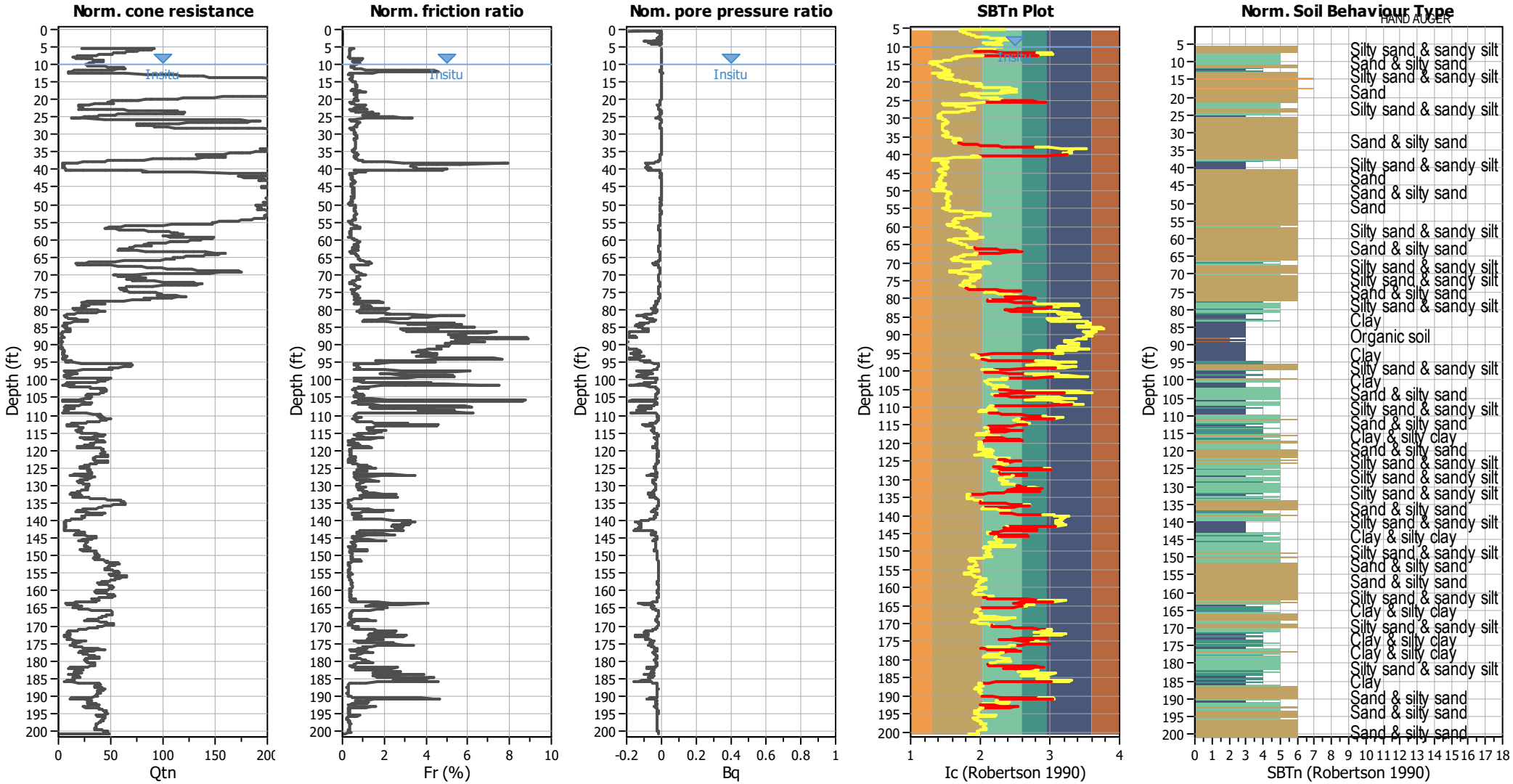
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



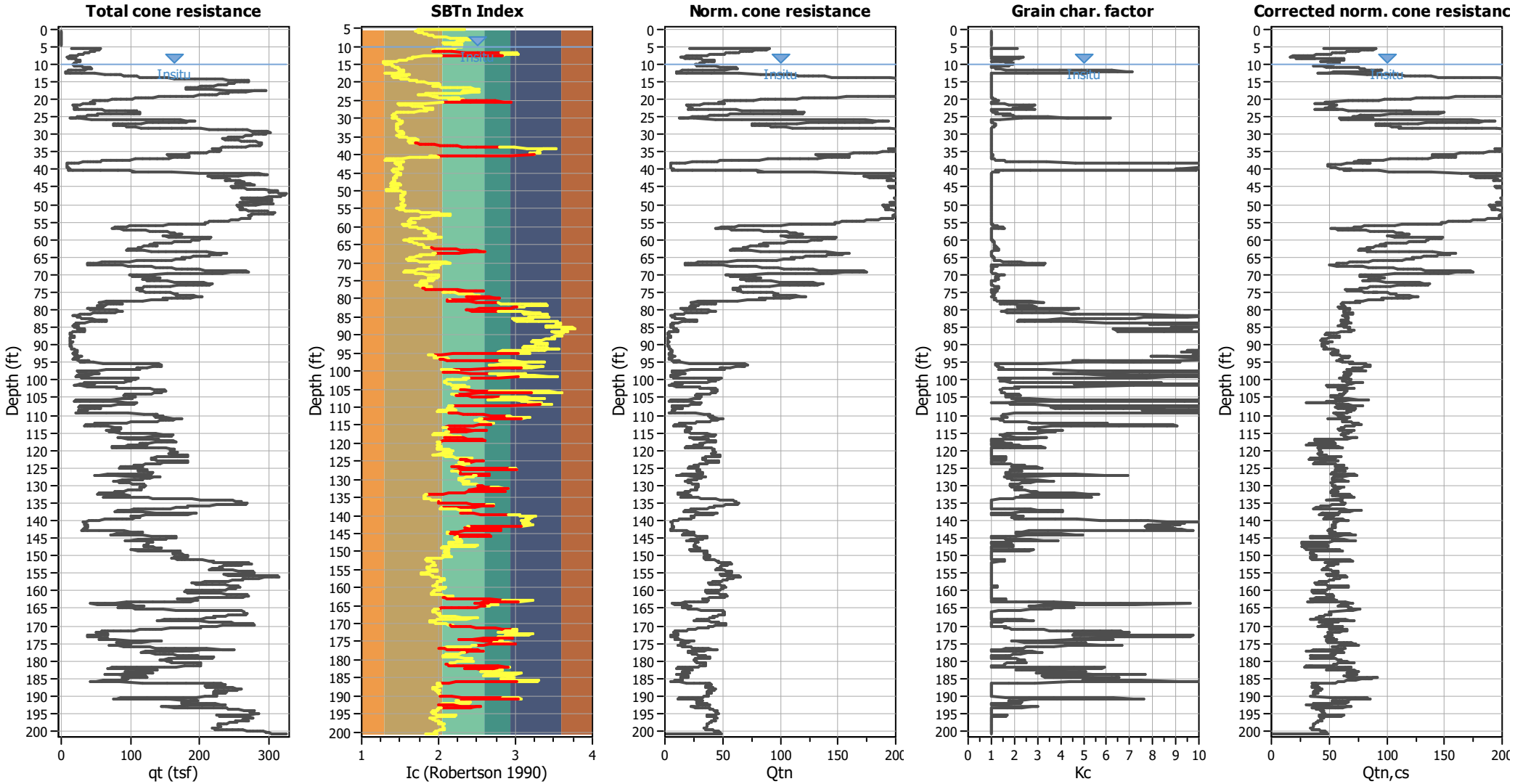
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

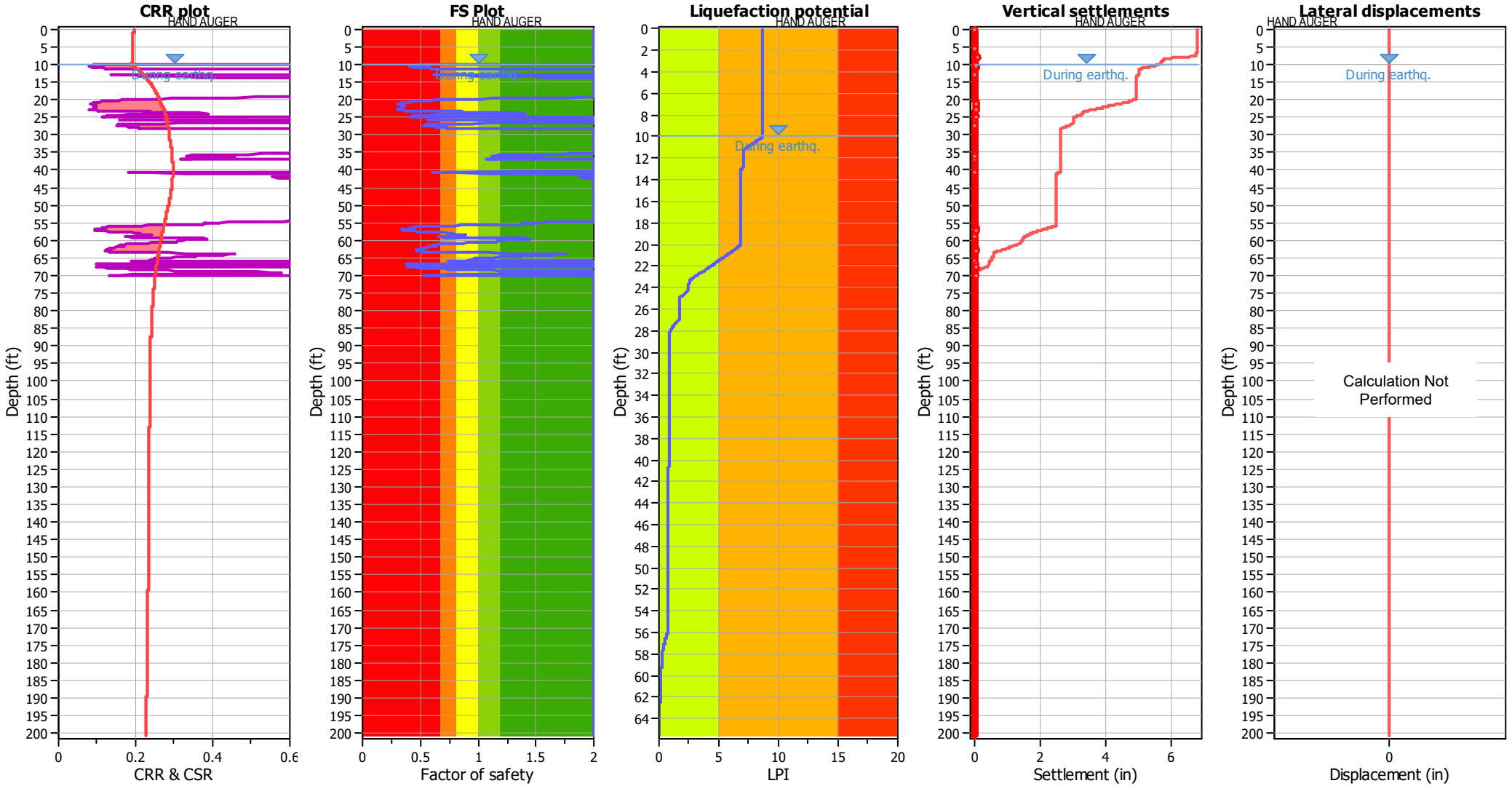
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

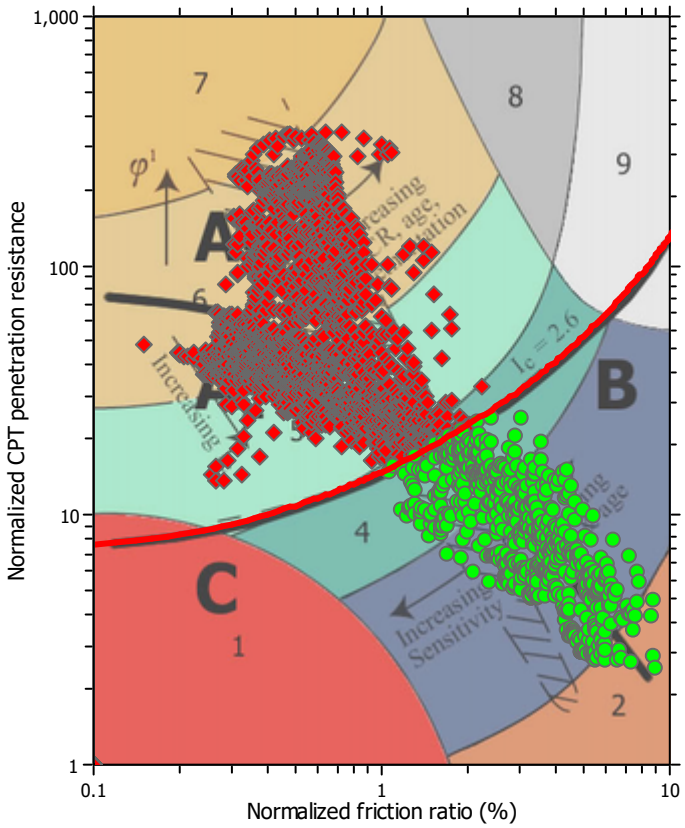
F.S. color scheme

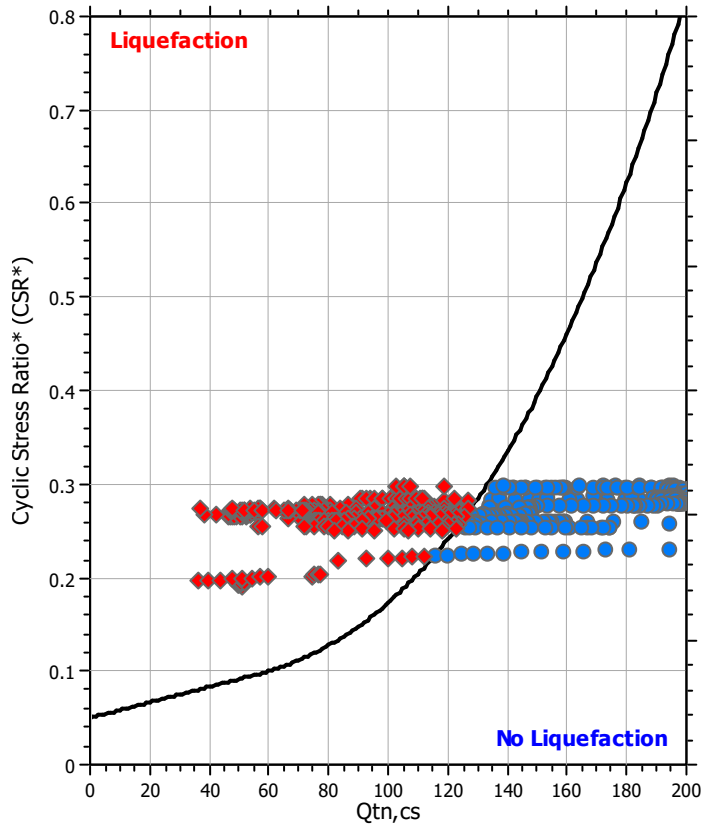
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

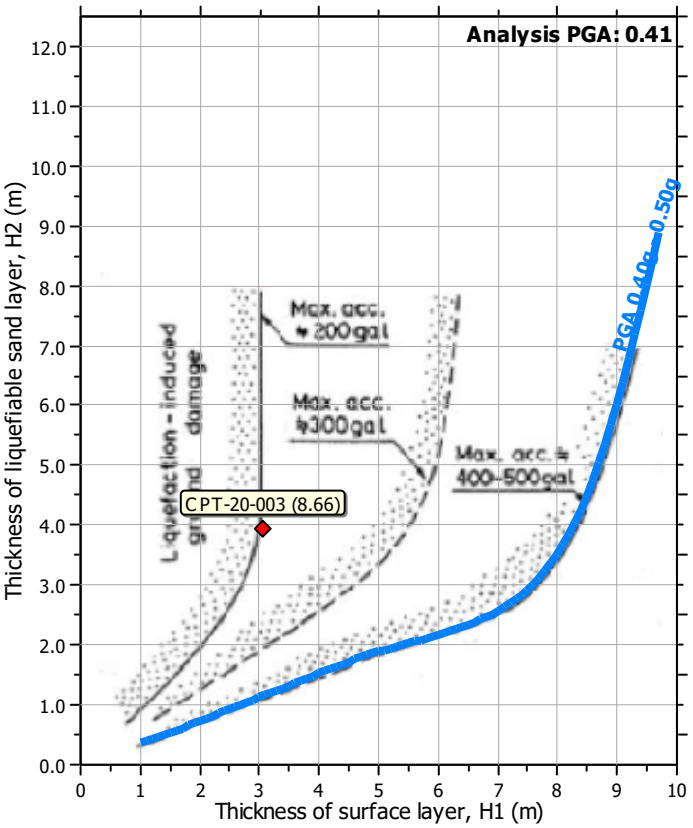
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



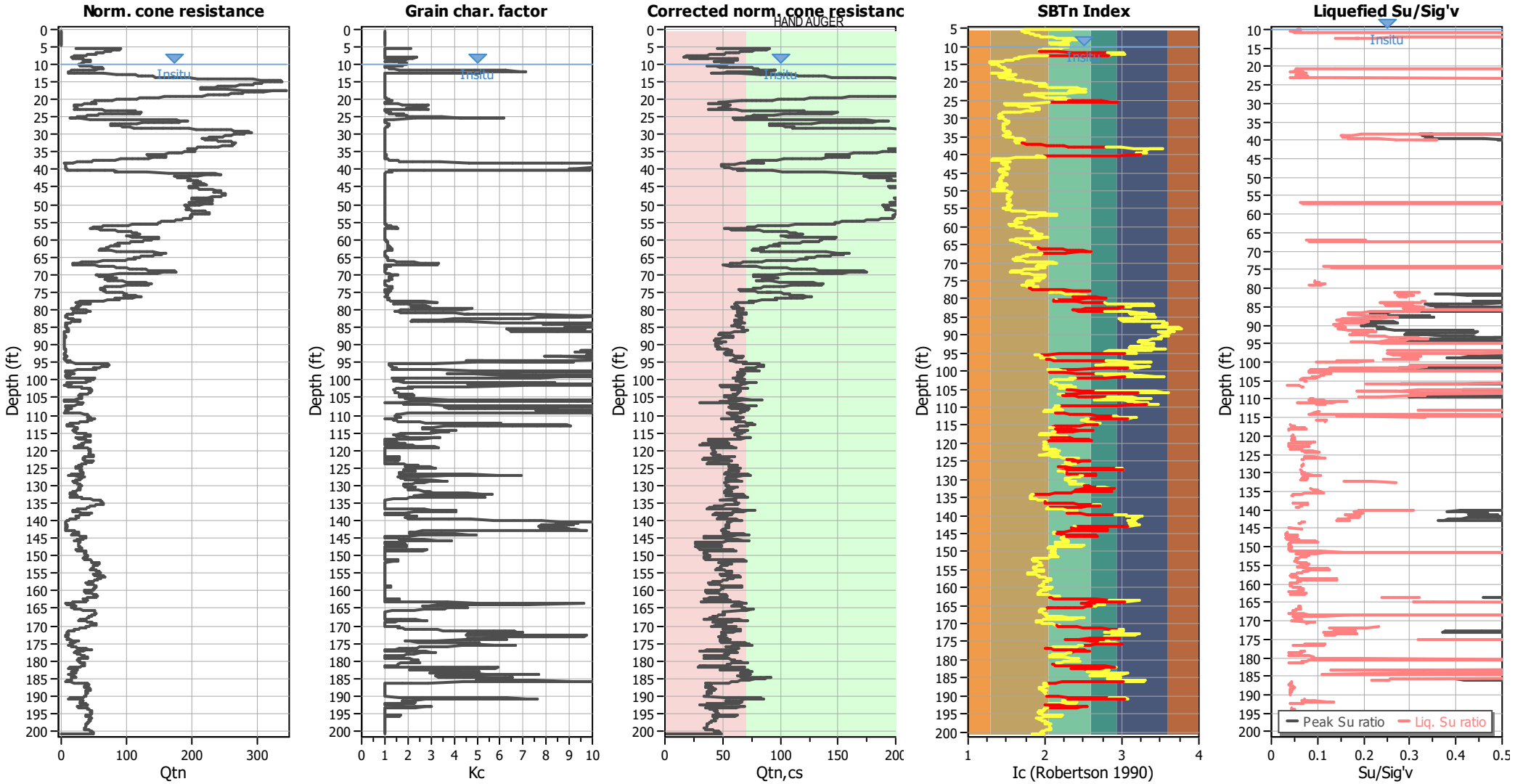




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

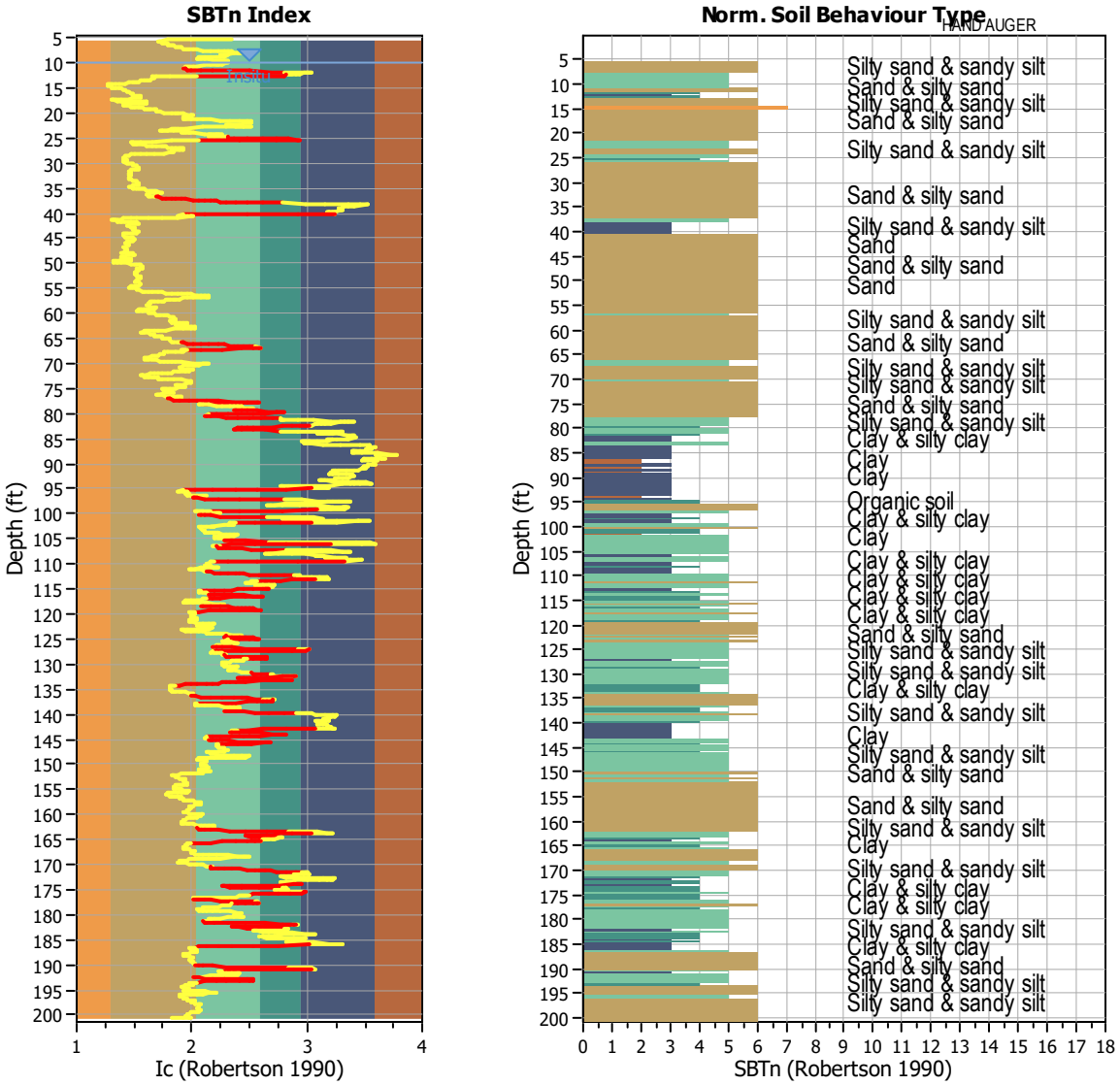
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.63	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	70.00 ft

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

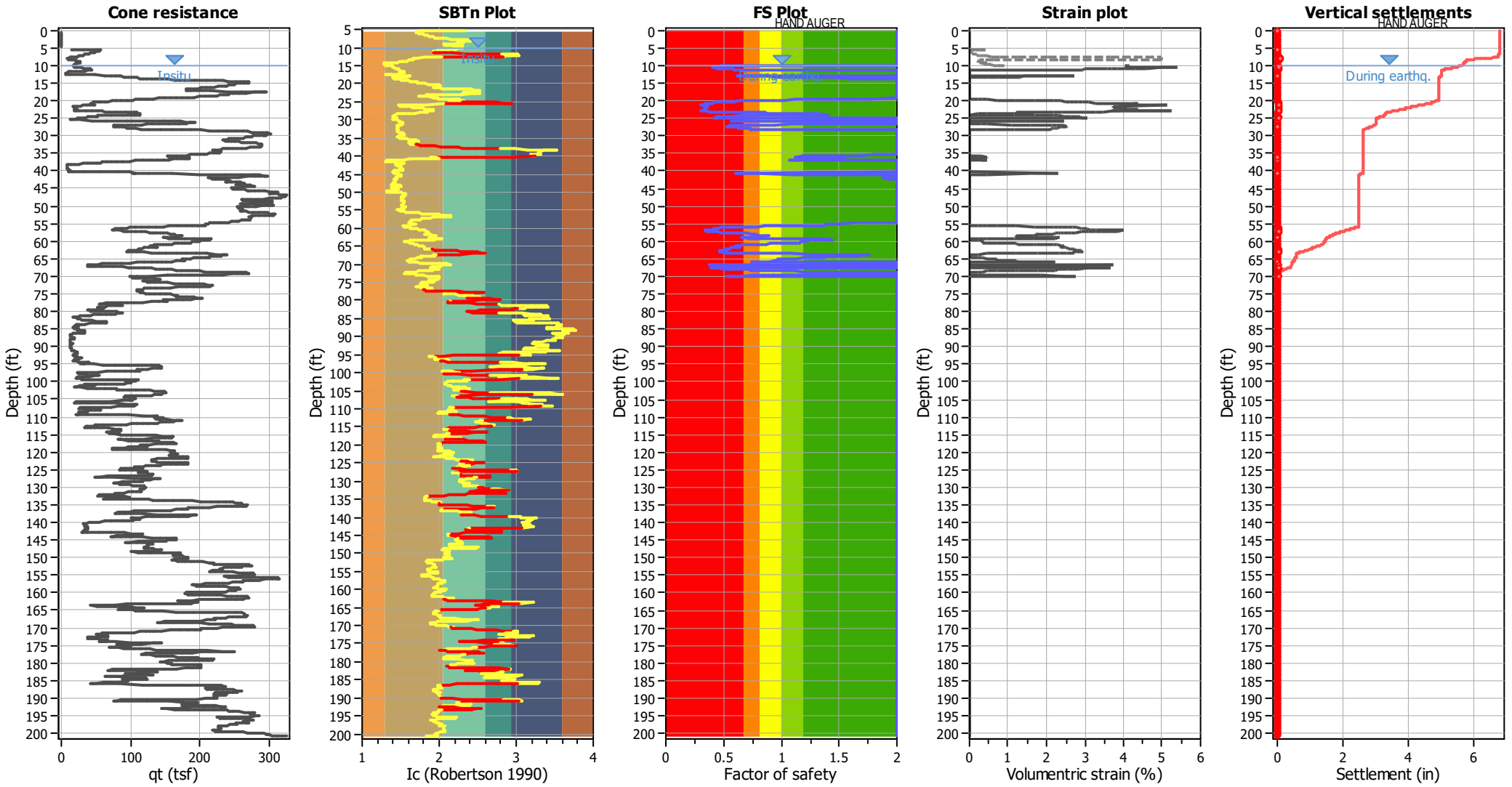
The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties		General statistics	
I_c minimum check value:	1.70	Total points in CPT file:	3061
I_c maximum check value:	3.00	Total points excluded:	554
I_c change ratio value:	0.0250	Exclusion percentage:	18.10%
Minimum number of points in layer:	4	Number of layers detected:	67

Estimation of post-earthquake settlements

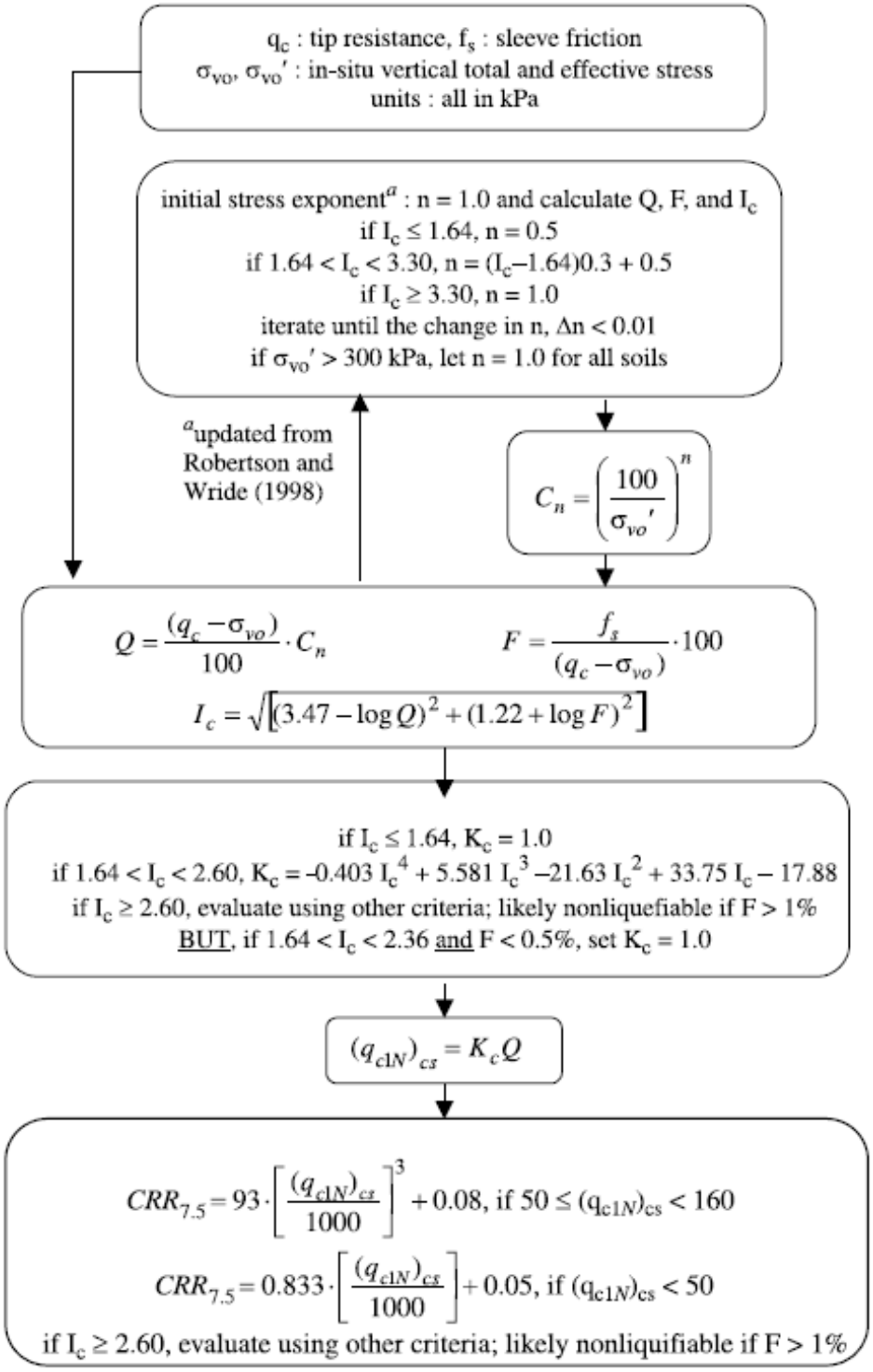


Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

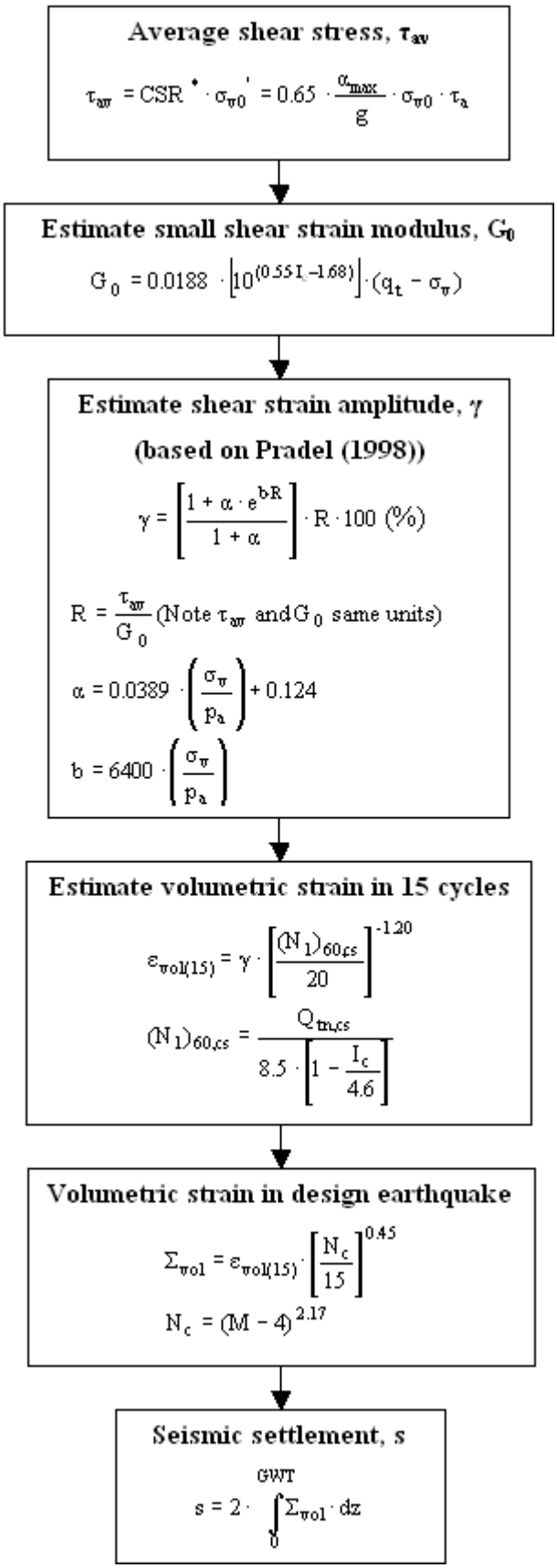
Procedure for the evaluation of soil liquefaction resistance, NCEER (1998)

Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. The procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:



[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

Procedure for the estimation of seismic induced settlements in dry sands



Robertson, P.K. and Lisheng, S., 2010, "Estimation of seismic compression in dry soils using the CPT" FIFTH INTERNATIONAL CONFERENCE ON RECENT ADVANCES IN GEOTECHNICAL EARTHQUAKE ENGINEERING AND SOIL DYNAMICS, Symposium in honor of professor I. M. Idriss, San Diego, CA

Liquefaction Potential Index (LPI) calculation procedure

Calculation of the Liquefaction Potential Index (LPI) is used to interpret the liquefaction assessment calculations in terms of severity over depth. The calculation procedure is based on the methology developed by Iwasaki (1982) and is adopted by AFPS.

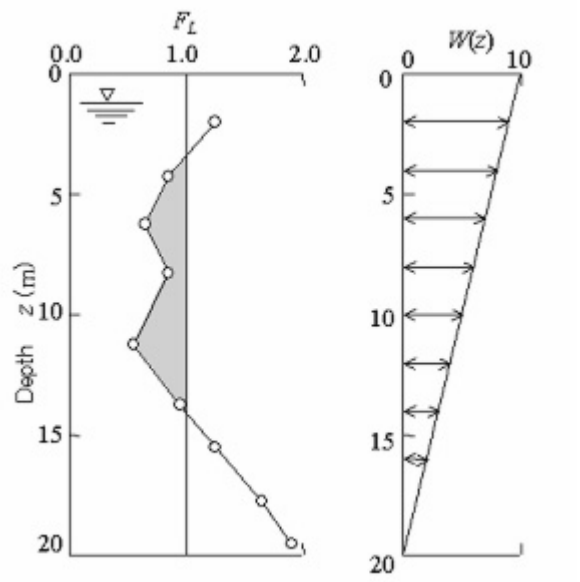
To estimate the severity of liquefaction extent at a given site, LPI is calculated based on the following equation:

$$\mathbf{LPI} = \int_0^{20} (10 - 0{,}5z) \times F_L \times dz$$

where:
F_L = 1 - F.S. when F.S. less than 1
F_L = 0 when F.S. greater than 1
z depth of measurment in meters

Values of LPI range between zero (0) when no test point is characterized as liquefiable and 100 when all points are characterized as susceptible to liquefaction. Iwasaki proposed four (4) discrete categories based on the numeric value of LPI:

- LPI = 0 : Liquefaction risk is very low
- 0 < LPI <= 5 : Liquefaction risk is low
- 5 < LPI <= 15 : Liquefaction risk is high
- LPI > 15 : Liquefaction risk is very high



Graphical presentation of the LPI calculation procedure

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G.3 LIQUEFACTION-INDUCED LATERAL SPREADING ANALYSES

PROJECT: Camino Del Mar Bridge Replacement
PROJECT NO.: 20180876.001A
SUBJECT: Liquefaction-Induced lateral spreading
Equations used in Calculations

DATE: 4/20/2020
PERFORMED BY: JB
REVIEWED BY: ZZ

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EQUATIONS USED IN CALCULATIONS

D_H repesents median values. The expected range lies within 1/2 to 2 times the median values.

Youd et al. (2002) Sloping Ground:

$$\log D_H = -16.213 + 1.532M - 1.406\log R^* - 0.012R + 0.338\log S + 0.540\log T_{15} + 3.413\log(100 - F_{15}) - 0.795\log(D50_{15} + 0.1\ \text{mm}) \quad (6b)$$

Youd et al. (2002) Free Face:

$$\log D_H = -16.713 + 1.532M - 1.406\log R^* - 0.012R + 0.592\log W + 0.540\log T_{15} + 3.413\log(100 - F_{15}) - 0.795\log(D50_{15} + 0.1\ \text{mm}) \quad (6a)$$

Bardet et al. (1999) Six Parameter Model:

$$Log(D_H + 0.01) = b_0 + b_{dif} + b_1 M + b_2 Log(R) + b_3 R + b_4 Log(W_{ff}) + b_5 Log(S_{gs}) + b_6 Log(T_{15}) + b_7 Log(100 - F_{15}) + b_8 D50_{15}$$

Where: W_{ff} = W (percent); S_{gs} = S (in percent)

Model coefficients	
b_0	-14.551
b_{dif}	-0.483
b_1	1.096
b_2	-0.873
b_3	-0.014
b_4	0.634
b_5	0.275
b_6	0.494
b_7	4.053
b_8	-0.814

Zhang et al. (2004):

$$D_r = 16\cdot\sqrt{(N_1)_{78}} = 14\cdot\sqrt{(N_1)_{60}} \quad [(N_1)_{60} \le 42]$$

$$D_r = -85 + 76\log(q_{c1N}) \quad (q_{c1N} \le 200)$$

$$\text{LDI} = \int_0^{Z_{max}} \gamma_{max}\, dz$$

(see chart to right for γ_{max}=f(Dr,Fξ.

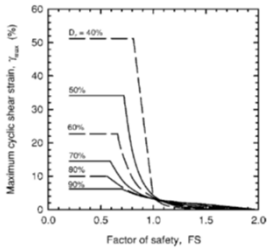
For sloping ground:

$$\frac{\text{LD}}{\text{LDI}} = S + 0.2 \quad (\text{for } 0.2\% < S < 3.5\%)$$

For free face:

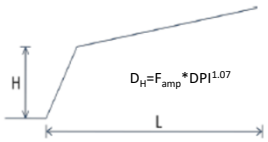
$$\frac{\text{LD}}{\text{LDI}} = 6\cdot\left(\frac{L}{H}\right)^{-0.8} \quad (\text{for } 4 < L/H < 40)$$

D_H = LD = LDI*(LD/LDI)



Faris (2004) and Caltrans (2012):

For Free Face:



$D_H = F_{amp} * DPI^{1.07}$

$$F_{amp} = \begin{cases} 2 & \text{for } L/H < 4 \\ 6\,(L/H)^{-0.8} & \text{for } 4 < L/H < 9 \\ 1 & \text{for } 9 < L/H \end{cases}$$

$$\gamma_{max} = \begin{cases} 0 & CSR \le 0.04 \\ \left(\frac{CSR - 0.04}{I_1 - 0.04}\right)0.01 & N_{1,60,cs} \le 15 \text{ AND } 0.04 \le CSR \le I_1 \\ 0.01 + \left(\frac{CSR - I_1}{I_2 - I_1}\right)0.02 & N_{1,60,cs} \le 17.5 \text{ AND } I_1 \le CSR \le I_2 \\ 1.859\left(1.1 - \sqrt{\frac{N_{1,60,cs} + \Delta n}{46}}\right)^3 \ge 0 & N_{1,60,cs} > 17.5 \text{ OR } CSR > I_2 \end{cases}$$

For sloping Ground:

$$D_H = S \cdot DPI^{1.07} \quad \textit{for } 0.25 \le S < 1 \textit{ and } S \textit{ is the slope (\%)}$$

$$I_1 = 0.04 + .00207\, N_{1,60,cs}$$

$$I_2 = 0.04 + .0047\, N_{1,60,cs}$$

$$\Delta n = N_{1,60,cs}\left(\frac{1}{\left(\frac{CSR - 0.04}{0.56}\right)^{1/3}} - 1\right)$$

$$DPI = \int_{layer}^{liq.} \gamma_{max}\, dz$$

Idriss & Boulanger (2008):

$$\text{LDI} = \int_0^{z_{max}} \gamma_{max} \cdot dz$$

$$\gamma_{lim} = 1.859\left(1.1 - \sqrt{\frac{(N_1)_{60cs}}{46}}\right)^3 \ge 0 \quad (\text{and } \gamma_{lim} \le 50)$$

$$\gamma_{max} = 0 \quad \text{if} \quad FS_{liq} \ge 2$$

$$\gamma_{max} = \min\left(\gamma_{lim},\ 0.035\,(2 - FS_{liq})\left(\frac{1 - F_\alpha}{FS_{liq} - F_\alpha}\right)\right) \quad \text{if} \quad 2 > FS_{liq} > F_\alpha$$

$$\gamma_{max} = \gamma_{lim} \quad \text{if} \quad FS_{liq} \le F_\alpha$$

$$F_\alpha = 0.032 + 0.69\sqrt{(N_1)_{60cs}} - 0.13\,(N_1)_{60cs}$$

with $(N_1)_{60cs}$ limited to values ≥ 7

Note: The Idriss & Boulanger (2008) method does not provide a way to convert from the Lateral Displacement Index (LDI) to an actual estimate for ground deformation that accounts for important factors such as earthquake magnitude, ground slope gradient, free face height and distance, etc. Idriss & Boulanger did not validate their method against an emprical dataset. For these reasons, the I&B method truly only produces an *index* of the expected lateral spreading ground deformtion. Despite these limitgations, the I&B calculation has been included for completeness an in cases where clients or projects require the I&B method.

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PROJECT:	Camino Del Mar Bridge Replacement	DATE:	4/20/2020
PROJECT NO.:	20180876.001A	PERFORMED BY:	JB
SUBJECT:	Liquefaction-Induced lateral spreading estimate	REVIEWED BY:	ZZ
	slope ground condition at piers		
	Based on boring CPT-20-001		

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OBJECTIVE: Estimate liquefaction-induced lateral spreading displacements using the five methods indicated below based on subsurface information from CPT-20-001 (near North Abutment).

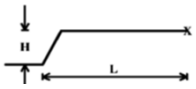
GIVENS: See Geometry in Geologic Cross-Section A-A'
See Stratigraphy in Cross Section A-A' and Boring and CPT Logs
Factors of safety and CPT or SPT data are calculated in a separate liquefaction triggering analysis. See the calculation package in Appendix G.

ASSUMPTIONS: Several simplyfying assumptions are necessary to perform this type of calculation: Simple geometry, average soil properties, site conditions fall within the range of characteristics of the model databases, etc.

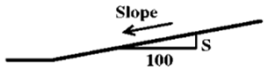
METHODOLGY: Five methods are used in the calculation:
1. Youd et al. (1999, 2002) and Bartlet & Youd (1995).
2. Bardet et al. (1999) 6-parameter model.
3. Zhang et al. (2004).
4. Faris (2004) as implemented by Caltrans (2012)
5. Idriss & Boulanger (2008)

Earthquake and Geometry Input

Variable Name	Variable Description	Input Values (enter SI or English)	Model Range: Youd et al (2002)	Bardet et al (1999)	Zhang et al (2004)	Faris (2004) Caltrans (2012)	Idriss & Boulanger (2008)
Mw	Moment magnitude of design EQ	6.63	6<Mw<8	6.4<Mw<9.2	6.4<Mw<9.2	not provdied	not provdied
R (km)	Equivalent distance to seismic source	3.5 km 2.2 mi	0.5km<R<100km	0.2km<R<100km	na	na	na
H (m)	Height of free face	4.0 m 13.0 ft	na	na	na	na	na
L (m)	Distance from toe of free face to site	9.1 m 30.0 ft	na	na	na	na	na
T_{15} (m)	Thickness of liq. layer w/ $(N1)_{60}$<=15	2.3 m 7.5 ft	1m<T_{15}<15m	0.2m<T_{15}<20m	na	na	na
F_{15} (%)	Average fines content (-#200) in T_{15} layer	5.0 %	0%<F_{15}<50%	0%<F_{15}<70%	na	na	na
$(D_{50})_{15}$ (mm)	Mean grain size in T_{15} layer	0.50 mm	0.07<$(D_{50})_{15}$ <3mm	0.04<$(D_{50})_{15}$<1.5mm	na	na	na
S (%)	Ground slope	4.3 %	0.1%<S<6%	0.05%<S<6%	0%<S<6.4%	not provdied	not provdied
W (%)	Free face ratio, W = H/L(100%)	43.3 %	1%<W<20%	1.6%<W<56%	2.5%<W<25%	not provdied	not provdied
Z_{T15} (m)	Depth to top of liq. layer	5.6 m 18.5 ft	1m<W<10m	na	na	not provdied	not provdied
Geometry	Free face of sloping ground condition	Sloping Ground	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"



"Free Face" Case



"Sloping Ground" Case

Youd (2002) Intermediate Calculations

R_0	$=10^{(0.89M-5.64)}$	1.8 km	1.1 mi
R*	= Req + R_0	5.4 km	3.3 mi

Use Faris/Caltrans? Yes

Soil Profile Input use in Zhang et al. (2004) and Faris/Caltrans Only

		Zhang et al., Faris/Caltrans and Idriss & Boulanger							Faris/Caltrans			Zhang et al.		I&B	
Layer No.	Soil Description	Depth to Top (feet)	Depth to Bot. (feet)	Layer Thickns (feet)	Use SPT or CPT $(N_1)_{60}$	q_{c1N}	FS_{liq}	FC (%)	CSR $_{M=7.5,\sigma'_{vo}=1}$	γ_{max} (%)	DPI (feet)	γ_{max} (%)	LDI (feet)	γ_{max} (%)	LDI (feet)
1	Poorly-Graded SAND with Silt (SP-SM)	0.0	10.0	10.0	41.2	200	NL	5	0.20	0.0	0.44	0.0	1.07	0.0	0.81
2	Poorly-Graded SAND with Silt (SP-SM)	10.0	13.0	3.0	31.1	140	NL	6	0.20	0.0	0.44	0.0	1.07	0.0	0.81
3	Poorly-Graded SAND with Silt (SP-SM)	13.0	18.5	5.5	39.7	190	NL	5	0.23	0.0	0.44	0.0	1.07	0.0	0.81
4	Poorly-Graded SAND with Silt (SP-SM)	18.5	22.0	3.5	21.3	93	0.74	5	0.26	5.3	0.44	10.8	1.07	8.3	0.81
5	Poorly-Graded SAND with Silt (SP-SM)	22.0	26.0	4.0	20.6	90	0.67	5	0.27	6.3	0.25	17.2	0.69	13.0	0.52

RESULTS

Lateral Spreading Displacement Estimate Results (D_H = Median)

	meters			feet		
	Low	Median	High	Low	Median	High
Youd et al. (2002):	**0.81**	**1.62**	**3.25**	**2.7**	**5.3**	**10.7**
Bardet et al. (1999):	**0.70**	**1.39**	**2.79**	**2.3**	**4.6**	**9.1**
Zhang et al. (2004):	**0.73**	**1.46**	**2.93**	**2.4**	**4.8**	**9.6**
Farris (2004) & Caltrans (2012):	**0.06**	**0.12**	**0.23**	**0.2**	**0.4**	**0.8**
Idriss & Boulanger (2008):	*See note below*			*See note below*		

CONCLUSIONS/INTERPRETATIONS:
Liquefiable layers accounted for in the upper 2H of the soil profile for lateral spreading calculations assuming mean grain size of 0.5mm.

Median "free-field" lateral spreading displacement for sloping condition at river channel range from approx. 0.5 to 5.5 feet. However, the piles would resist lateral flow resulting in lower lateral displacements.

PROJECT: Camino Del Mar Bridge Replacement
PROJECT NO.: 20180876.001A
SUBJECT: Liquefaction-Induced lateral spreading estimate
Based on boring CPT-20-002A

DATE: 4/21/2020
PERFORMED BY: JB
REVIEWED BY: ZZ

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OBJECTIVE: Estimate liquefaction-induced lateral spreading displacements using the five methods indicated below based on subsurface information from CPT-20-002A (near central portion of bridge).

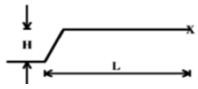
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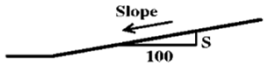
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Earthquake and Geometry Input

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H (m)	Height of free face	3.0 m 10.0 ft	na	na	na	na	na
L (m)	Distance from toe of free face to site	9.1 m 30.0 ft	na	na	na	na	na
T_{15} (m)	Thickness of liq. layer w/ $(N1)_{60}$<=15	2.8 m 9.3 ft	1m<T_{15}<15m	0.2m<T_{15}<20m	na	na	na
F_{15} (%)	Average fines content (-#200) in T_{15} layer	5.0 %	0%<F_{15}<50%	0%<F_{15}<70%	na	na	na
$(D_{50})_{15}$ (mm)	Mean grain size in T_{15} layer	0.50 mm	0.07<$(D_{50})_{15}$ <3mm	0.04<$(D_{50})_{15}$<1.5mm	na	na	na
S (%)	Ground slope	4.3 %	0.1%<S<6%	0.05%<S<6%	0%<S<6.4%	not provdied	not provdied
W (%)	Free face ratio, W = H/L(100%)	33.3 %	1%<W<20%	1.6%<W<56%	2.5%<W<25%	not provdied	not provdied
Z_{T15} (m)	Depth to top of liq. layer	0.0 m 0.0 ft	1m<W<10m	na	na	not provdied	not provdied
Geometry	Free face of sloping ground condition	Sloping Ground	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"



"Free Face" Case



"Sloping Ground" Case

Youd (2002) Intermediate Calculations

R_0	$=10^{(0.89M-5.64)}$	1.8 km	1.1 mi
R*	= Req + R_0	5.4 km	3.3 mi

Use Faris/Caltrans? Yes

Soil Profile Input use in Zhang et al. (2004) and Faris/Caltrans Only

		Zhang et al., Faris/Caltrans and Idriss & Boulanger							Faris/Caltrans			Zhang et al.		I&B	
Layer No.	Soil Description	Depth to Top (feet)	Depth to Bot. (feet)	Layer Thickns (feet)	Use SPT or CPT $(N_1)_{60}$	q_{c1N}	FS_{liq}	FC (%)	CSR $_{M=7.5,\sigma'_{vo}=1}$	γ_{max} (%)	DPI (feet)	γ_{max} (%)	LDI (feet)	γ_{max} (%)	LDI (feet)
1	Silty SAND to Sandy SILT (SM to ML)	0.0	1.8	1.8	2.0	24	0.35	30	0.19	73.9	5.10	51.2	4.76	50.0	4.45
2	Sensitive Fine-Grained (OL to CH)	1.8	13.0	11.2	3.4	6	NL	80	0.20	0.0	3.77	0.0	3.84	0.0	3.55
3	Silty SAND (SM)	13.0	14.7	1.7	7.8	43	0.36	15	0.22	39.0	3.77	51.2	3.84	42.0	3.55
4	Sandy SILT (ML)	14.7	20.5	5.8	4.1	31	0.27	50	0.24	53.6	3.11	51.2	2.97	48.8	2.83

RESULTS

Lateral Spreading Displacement Estimate Results (D_H = Median)

	meters			feet		
	Low	Median	High	Low	Median	High
Youd et al. (2002):	**0.91**	**1.82**	**3.65**	**3.0**	**6.0**	**12.0**
Bardet et al. (1999):	**0.77**	**1.55**	**3.10**	**2.5**	**5.1**	**10.2**
Zhang et al. (2004):	**3.27**	**6.53**	**13.07**	**10.7**	**21.4**	**42.9**
Farris (2004) & Caltrans (2012):	**0.80**	**1.61**	**3.21**	**2.6**	**5.2**	**10.5**
Idriss & Boulanger (2008):	*See note below*			*See note below*		

CONCLUSIONS/INTERPRETATIONS:
Liquefiable layers accounted for in the upper approximate 2H of the soil profile for lateral spreading calculations assuming mean grain size of 0.5mm.

Median "free-field" lateral spreading displacement for sloping condition at river channel range from approx. 5 to 6 feet (excluding Zhang due to unreasonbly high value). However, the piles would resist lateral flow resulting in lower lateral displacements.

PROJECT:	Camino Del Mar Bridge Replacement	DATE:	4/20/2020
PROJECT NO.:	20180876.001A	PERFORMED BY:	JB
SUBJECT:	Liquefaction-Induced lateral spreading estimate	REVIEWED BY:	ZZ
	Sloping ground condition at piers		
	Based on boring CPT-20-003		

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OBJECTIVE: Estimate liquefaction-induced lateral spreading displacements using the five methods indicated below based on subsurface information from CPT-20-003 (near Sorth Abutment)

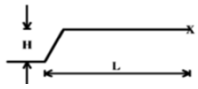
GIVENS: See Geometry in geologic Cross-Section A-A'
See Stratigraphy in Cross Section A-A' and Boring and CPT Logs
Factors of safety and CPT or SPT data are calculated in a separate liquefaction triggering analysis. See the calculation package in Appendix G.

ASSUMPTIONS: Several simplyfying assumptions are necessary to perform this type of calculation: Simple geometry, average soil properties, site conditions fall within the range of characteristics of the model databases, etc.

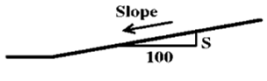
METHODOLGY: Five methods are used in the calculation:
1. Youd et al. (1999, 2002) and Bartlet & Youd (1995).
2. Bardet et al. (1999) 6-parameter model.
3. Zhang et al. (2004).
4. Faris (2004) as implemented by Caltrans (2012)
5. Idriss & Boulanger (2008)

Earthquake and Geometry Input

Variable Name	Variable Description	Input Values (enter SI or English)	Model Range: Youd et al (2002)	Bardet et al (1999)	Zhang et al (2004)	Faris (2004) Caltrans (2012)	Idriss & Boulanger (2008)
Mw	Moment magnitude of design EQ	6.63	6<Mw<8	6.4<Mw<9.2	6.4<Mw<9.2	not provdied	not provdied
R (km)	Equivalent distance to seismic source	3.5 km 2.2 mi	0.5km<R<100km	0.2km<R<100km	na	na	na
H (m)	Height of free face	3.0 m 10.0 ft	na	na	na	na	na
L (m)	Distance from toe of free face to site	9.1 m 30.0 ft	na	na	na	na	na
T_{15} (m)	Thickness of liq. layer w/ $(N1)_{60}$<=15	1.7 m 5.5 ft	1m<T_{15}<15m	0.2m<T_{15}<20m	na	na	na
F_{15} (%)	Average fines content (-#200) in T_{15} layer	5.0 %	0%<F_{15}<50%	0%<F_{15}<70%	na	na	na
$(D_{50})_{15}$ (mm)	Mean grain size in T_{15} layer	0.50 mm	0.07<$(D_{50})_{15}$ <3mm	0.04<$(D_{50})_{15}$<1.5mm	na	na	na
S (%)	Ground slope	4.3 %	0.1%<S<6%	0.05%<S<6%	0%<S<6.4%	not provdied	not provdied
W (%)	Free face ratio, W = H/L(100%)	33.3 %	1%<W<20%	1.6%<W<56%	2.5%<W<25%	not provdied	not provdied
Z_{T15} (m)	Depth to top of liq. layer	3.0 m 10.0 ft	1m<W<10m	na	na	not provdied	not provdied
Geometry	Free face of sloping ground condition	Sloping Ground	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"



"Free Face" Case



"Sloping Ground" Case

Youd (2002) Intermediate Calculations

R_0	$=10^{(0.89M-5.64)}$	1.8 km	1.1 mi
R*	= Req + R_0	5.4 km	3.3 mi

Use Faris/Caltrans? Yes

Soil Profile Input use in Zhang et al. (2004) and Faris/Caltrans Only

		Zhang et al., Faris/Caltrans and Idriss & Boulanger							Faris/Caltrans			Zhang et al.		I&B	
Layer No.	Soil Description	Depth to Top (feet)	Depth to Bot. (feet)	Layer Thickns (feet)	Use SPT or CPT $(N_1)_{60}$	Use SPT or CPT q_{c1N}	FS_{liq}	FC (%)	CSR $_{M=7.5,\sigma'_{vo}=1}$	γ_{max} (%)	DPI (feet)	γ_{max} (%)	LDI (feet)	γ_{max} (%)	LDI (feet)
1	Poorly-Graded SAND with Silt (SP-SM)	0.0	10.0	10.0	8.7	46	NL	5	0.19	0.0	1.82	0.0	2.31	0.0	1.94
2	Poorly-Graded SAND with Silt (SP-SM)	10.0	11.2	1.2	8.1	44	0.44	5	0.21	37.7	1.82	51.2	2.31	50.0	1.94
3	Poorly-Graded SAND with Silt (SP-SM)	11.2	12.7	1.5	3.2	28	NL	5	0.23	0.0	1.37	0.0	1.69	0.0	1.34
4	Poorly-Graded SAND with Silt (SP-SM)	12.7	13.7	1.0	25.7	113	0.91	5	0.24	1.8	1.37	4.2	1.69	4.3	1.34
5	Poorly-Graded SAND (SP)	13.7	19.7	6.0	48.6	253	NL	3	0.27	0.0	1.35	0.0	1.65	0.0	1.30
6	Silty SAND (SM)	19.7	23.0	3.3	8.4	45	0.38	15	0.29	41.1	1.35	50.1	1.65	39.3	1.30

RESULTS

Lateral Spreading Displacement Estimate Results (D_H = Median)

	meters			feet		
	Low	Median	High	Low	Median	High
Youd et al. (2002):	**0.69**	**1.37**	**2.75**	**2.3**	**4.5**	**9.0**
Bardet et al. (1999):	**0.60**	**1.19**	**2.39**	**2.0**	**3.9**	**7.8**
Zhang et al. (2004):	**1.58**	**3.17**	**6.34**	**5.2**	**10.4**	**20.8**
Farris (2004) & Caltrans (2012):	**0.27**	**0.53**	**1.07**	**0.9**	**1.7**	**3.5**
Idriss & Boulanger (2008):	*See note below*			*See note below*		

CONCLUSIONS/INTERPRETATIONS:
Liquefiable layers accounted for in the upper approximate 2H of the soil profile for lateral spreading calculations assuming mean grain size of 0.5mm.

Median "free-field" lateral spreading displacement for sloping condition at river channel range from approx. 2 to 4.5 feet (excluding Zhang due to unreasonbly high value). However, the piles would resist lateral flow resulting in lower lateral displacements.

PROJECT: Camino Del Mar Bridge Replacement
PROJECT NO.: 20180876.001A
SUBJECT: Liquefaction-Induced lateral spreading estimate
Sloping ground condition at piers
Based on boring R-20-001

DATE: 4/20/2020
PERFORMED BY: JB
REVIEWED BY: ZZ

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OBJECTIVE: Estimate liquefaction-induced lateral spreading displacements using the five methods indicated below based on subsurface information from boring R-20-001 (near North Abutment)

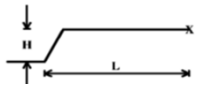
GIVENS: See Geometry in geologic Cross-Section A-A'
See Stratigraphy in Cross Section A-A' and Boring and CPT Logs
Factors of safety and CPT or SPT data are calculated in a separate liquefaction triggering analysis. See the calculation package in Appendix G.

ASSUMPTIONS: Several simplyfying assumptions are necessary to perform this type of calculation: Simple geometry, average soil properties, site conditions fall within the range of characteristics of the model databases, etc.

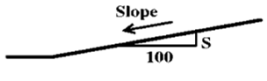
METHODOLGY: Five methods are used in the calculation:
1. Youd et al. (1999, 2002) and Bartlet & Youd (1995).
2. Bardet et al. (1999) 6-parameter model.
3. Zhang et al. (2004).
4. Faris (2004) as implemented by Caltrans (2012)
5. Idriss & Boulanger (2008)

Earthquake and Geometry Input

Variable Name	Variable Description	Input Values (enter SI or English)		Model Range: Youd et al (2002)	Bardet et al (1999)	Zhang et al (2004)	Faris (2004) Caltrans (2012)	Idriss & Boulanger (2008)
Mw	Moment magnitude of design EQ	6.63		6<Mw<8	6.4<Mw<9.2	6.4<Mw<9.2	not provdied	not provdied
R (km)	Equivalent distance to seismic source	3.5 km	2.2 mi	0.5km<R<100km	0.2km<R<100km	na	na	na
H (m)	Height of free face	4.0 m	13.0 ft	na	na	na	na	na
L (m)	Distance from toe of free face to site	9.1 m	30.0 ft	na	na	na	na	na
T_{15} (m)	Thickness of liq. layer w/ $(N1)_{60}$<=15	1.7 m	5.5 ft	1m<T_{15}<15m	0.2m<T_{15}<20m	na	na	na
F_{15} (%)	Average fines content (-#200) in T_{15} layer	5.0 %		0%<F_{15}<50%	0%<F_{15}<70%	na	na	na
$(D_{50})_{15}$ (mm)	Mean grain size in T_{15} layer	0.50 mm		0.07<$(D_{50})_{15}$ <3mm	0.04<$(D_{50})_{15}$<1.5mm	na	na	na
S (%)	Ground slope	4.3 %		0.1%<S<6%	0.05%<S<6%	0%<S<6.4%	not provdied	not provdied
W (%)	Free face ratio, W = H/L(100%)	43.3 %		1%<W<20%	1.6%<W<56%	2.5%<W<25%	not provdied	not provdied
Z_{T15} (m)	Depth to top of liq. layer	5.9 m	19.5 ft	1m<W<10m	na	na	not provdied	not provdied
Geometry	Free face of sloping ground condition	Sloping Ground		"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"



"Free Face" Case



"Sloping Ground" Case

Youd (2002) Intermediate Calculations

R_0	$=10^{(0.89M-5.64)}$	1.8 km	1.1 mi
R*	= Req + R_0	5.4 km	3.3 mi

Use Faris/Caltrans? Yes

Soil Profile Input use in Zhang et al. (2004) and Faris/Caltrans Only

		Zhang et al., Faris/Caltrans and Idriss & Boulanger							Faris/Caltrans			Zhang et al.		I&B	
Layer No.	Soil Description	Depth to Top (feet)	Depth to Bot. (feet)	Layer Thickns (feet)	Use SPT or CPT $(N_1)_{60}$	q_{c1N}	FS_{liq}	FC (%)	CSR $_{M=7.5,\sigma'_{vo}=1}$	γ_{max} (%)	DPI (feet)	γ_{max} (%)	LDI (feet)	γ_{max} (%)	LDI (feet)
1	Poorly-Graded SAND with Silt (SP-SM)	0.0	7.5	7.5	56.0	314	NL	5.1	0.19	0.0	1.56	0.0	2.19	0.0	2.29
2	Poorly-Graded SAND with Silt (SP-SM)	7.5	10.0	2.5	46.0	233	NL	11	0.19	0.0	1.56	0.0	2.19	0.0	2.29
3	Poorly-Graded SAND with Silt (SP-SM)	10.0	11.5	1.5	42.0	205	NL	6	0.20	0.0	1.56	0.0	2.19	0.0	2.29
4	Poorly-Graded SAND with Silt (SP-SM)	11.5	13.5	2.0	34.0	156	NL	6	0.21	0.0	1.56	0.0	2.19	0.0	2.29
5	Poorly-Graded SAND with Silt (SP-SM)	13.5	15.5	2.0	57.0	323	NL	6.2	0.23	0.0	1.56	0.0	2.19	0.0	2.29
6	Poorly-Graded SAND with Silt (SP-SM)	15.5	17.5	2.0	39.0	186	NL	5	0.24	0.0	1.56	0.0	2.19	0.0	2.29
7	Poorly-Graded SAND with Silt (SP-SM)	17.5	19.5	2.0	26.0	114	1.21	3.9	0.26	2.0	1.56	1.9	2.19	2.2	2.29
8	Poorly-Graded SAND with Silt (SP-SM)	19.5	21.5	2.0	12.0	57	0.49	5.5	0.26	23.7	1.52	36.7	2.16	38.0	2.24
9	Poorly-Graded SAND with Silt (SP-SM)	21.5	25.0	3.5	11.0	54	0.46	5.5	0.27	28.1	1.04	40.2	1.42	42.4	1.48
10	Poorly-Graded SAND with Silt (SP-SM)	25.0	28.0	3.0	27.0	119	2	5.5	0.28	1.9	0.06	0.5	0.02	0.0	0.00

RESULTS

Lateral Spreading Displacement Estimate Results (D_H = Median)

	meters			feet		
	Low	Median	High	Low	Median	High
Youd et al. (2002):	**0.69**	**1.37**	**2.75**	**2.3**	**4.5**	**9.0**
Bardet et al. (1999):	**0.60**	**1.19**	**2.39**	**2.0**	**3.9**	**7.8**
Zhang et al. (2004):	**1.50**	**3.01**	**6.02**	**4.9**	**9.9**	**19.7**
Farris (2004) & Caltrans (2012):	**0.23**	**0.45**	**0.90**	**0.7**	**1.5**	**3.0**
Idriss & Boulanger (2008):	*See note below*			*See note below*		

CONCLUSIONS/INTERPRETATIONS:
Liquefiable layers accounted for in the upper 2H of the soil profile for lateral spreading calculations assuming mean grain size of 0.5mm.

Median "free-field" lateral spreading displacement for sloping condition at river channel range from approx. 1.5 to 4.5 feet (excluding Zhang due to unreasonably high value). However, the piles would resist lateral flow resulting in lower lateral displacements.

PROJECT: Camino Del Mar Bridge Replacement
PROJECT NO.: 20180876.001A
SUBJECT: Liquefaction-Induced lateral spreading estimate
Sloping ground condition at piers
Based on boring R-20-002

DATE: 4/20/2020
PERFORMED BY: JB
REVIEWED BY: ZZ

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OBJECTIVE: Estimate liquefaction-induced lateral spreading displacements using the five methods indicated below based on subsurface information from boring R-20-002 (near South Abutment)

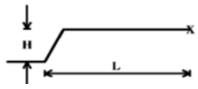
GIVENS: See Geometry in geologic Cross-Section A-A'
See Stratigraphy in Cross Section A-A' and Boring and CPT Logs
Factors of safety and CPT or SPT data are calculated in a separate liquefaction triggering analysis. See the calculation package in Appendix G.

ASSUMPTIONS: Several simplyfying assumptions are necessary to perform this type of calculation: Simple geometry, average soil properties, site conditions fall within the range of characteristics of the model databases, etc.

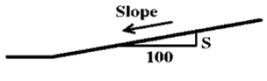
METHODOLGY: Five methods are used in the calculation:
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5. Idriss & Boulanger (2008)

Earthquake and Geometry Input

Variable Name	Variable Description	Input Values (enter SI or English)	Model Range: Youd et al (2002)	Bardet et al (1999)	Zhang et al (2004)	Faris (2004) Caltrans (2012)	Idriss & Boulanger (2008)
Mw	Moment magnitude of design EQ	6.63	6<Mw<8	6.4<Mw<9.2	6.4<Mw<9.2	not provdied	not provdied
R (km)	Equivalent distance to seismic source	3.5 km 2.2 mi	0.5km<R<100km	0.2km<R<100km	na	na	na
H (m)	Height of free face	3.0 m 10.0 ft	na	na	na	na	na
L (m)	Distance from toe of free face to site	9.1 m 30.0 ft	na	na	na	na	na
T_{15} (m)	Thickness of liq. layer w/ $(N1)_{60}$<=15	2.6 m 8.5 ft	1m<T_{15}<15m	0.2m<T_{15}<20m	na	na	na
F_{15} (%)	Average fines content (-#200) in T_{15} layer	5.0 %	0%<F_{15}<50%	0%<F_{15}<70%	na	na	na
$(D_{50})_{15}$ (mm)	Mean grain size in T_{15} layer	0.50 mm	0.07<$(D_{50})_{15}$ <3mm	0.04<$(D_{50})_{15}$<1.5mm	na	na	na
S (%)	Ground slope	4.3 %	0.1%<S<6%	0.05%<S<6%	0%<S<6.4%	not provdied	not provdied
W (%)	Free face ratio, W = H/L(100%)	33.3 %	1%<W<20%	1.6%<W<56%	2.5%<W<25%	not provdied	not provdied
Z_{T15} (m)	Depth to top of liq. layer	3.0 m 10.0 ft	1m<W<10m	na	na	not provdied	not provdied
Geometry	Free face of sloping ground condition	Sloping Ground	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"	"Free Face" or "Sloping Ground"



"Free Face" Case



"Sloping Ground" Case

Youd (2002) Intermediate Calculations

R_0	$=10^{(0.89M-5.64)}$	1.8 km	1.1 mi
R*	= Req + R_0	5.4 km	3.3 mi

Use Faris/Caltrans? Yes

Soil Profile Input use in Zhang et al. (2004) and Faris/Caltrans Only

		Zhang et al., Faris/Caltrans and Idriss & Boulanger							Faris/Caltrans			Zhang et al.		I&B	
Layer No.	Soil Description	Depth to Top (feet)	Depth to Bot. (feet)	Layer Thickns (feet)	Use SPT or CPT $(N_1)_{60}$	q_{c1N}	FS_{liq}	FC (%)	CSR $_{M=7.5,\sigma'_{vo}=1}$	γ_{max} (%)	DPI (feet)	γ_{max} (%)	LDI (feet)	γ_{max} (%)	LDI (feet)
1	Poorly-Graded SAND (SP)	0.0	7.0	7.0	26.0	114	NL	3.3	0.19	0.0	3.94	0.0	4.05	0.0	3.83
2	Poorly-Graded SAND with Silt (SP-SM)	7.0	8.5	1.5	24.0	105	NL	5.6	0.19	0.0	3.94	0.0	4.05	0.0	3.83
3	Poorly-Graded SAND with Silt (SP-SM)	8.5	10.0	1.5	9.0	47	NL	5	0.20	0.0	3.94	0.0	4.05	0.0	3.83
4	Poorly-Graded SAND with Silt (SP-SM)	10.0	12.5	2.5	4.0	31	0.37	5.2	0.22	76.5	3.94	51.2	4.05	50.0	3.83
5	Poorly-Graded SAND with Silt (SP-SM)	12.5	14.0	1.5	8.0	44	0.46	5	0.23	40.3	2.03	51.2	2.77	50.0	2.58
6	Poorly-Graded SAND (SP)	14.0	16.5	2.5	11.0	54	0.5	3.2	0.24	26.1	1.43	40.2	2.00	42.4	1.83
7	Poorly-Graded SAND (SP)	16.5	18.5	2.0	41.0	199	NL	3	0.25	0.0	0.78	0.0	1.00	0.0	0.77
8	Poorly-Graded SAND(SP)	18.5	20.5	2.0	25.0	110	1.14	3	0.26	2.5	0.78	2.2	1.00	2.5	0.77
9	Silty SAND (SM)	20.5	22.5	2.0	9.0	47	0.52	16	0.27	36.3	0.73	47.8	0.96	35.7	0.71

RESULTS

Lateral Spreading Displacement Estimate Results (D_H = Median)

	meters			feet		
	Low	Median	High	Low	Median	High
Youd et al. (2002):	**0.87**	**1.74**	**3.47**	**2.8**	**5.7**	**11.4**
Bardet et al. (1999):	**0.74**	**1.48**	**2.96**	**2.4**	**4.9**	**9.7**
Zhang et al. (2004):	**2.78**	**5.56**	**11.12**	**9.1**	**18.2**	**36.5**
Farris (2004) & Caltrans (2012):	**0.61**	**1.22**	**2.44**	**2.0**	**4.0**	**8.0**
Idriss & Boulanger (2008):	*See note below*			*See note below*		

CONCLUSIONS/INTERPRETATIONS:
Liquefiable layers accounted for in the upper approximate 2H of the soil profile for lateral spreading calculations assuming mean grain size of 0.5mm.

Median "free-field" lateral spreading displacement for sloping condition within river channel range from approx.4 to 6 feet (excluding Zhang due to unreasonably high value). However, the piles would resist lateral flow resulting in lower lateral displacements.

G.4 SLOPE STABILITY AND SEISMIC SLOPE DISPLACEMENT ANALYSES

Soil Description	γ_{total} (pcf)	Static Slope Stability Strength Parameters					Seismic Slope Stability Strength Parameters				
		Model	Static		Rapid Drawdown		Model	Yield Acceleration		Post-Liquefaction		Residual Strength
			c' / Su (psf)	Φ'	c' (psf)	Φ'		c' / Su (psf)	Φ'	c' / Su (psf)	Φ'	Sr (psf)
Artificial Fill (af) (above water)	120	Mohr-Coulomb	50	33	50	33	Mohr-Coulomb	50	34	50	33	-
Recent Alluvial Deposits (Qa) (Sand)	120	Mohr-Coulomb	50	28	50	28	Undrained (Phi = 0)	-	-	-	-	450
Recent Alluvial Deposits (Qa) (Clay)	110	Undrained (Phi=0)	400	0	0	18	Undrained (Phi=0)	400	0	400	0	-
Young Alluvial Deposits (Qya) (Sand)	125	Mohr-Coulomb	50	32	50	32	Undrained (Phi = 0)	-	-	-	-	700
Young Estuarine Deposits (Qyes) (Clay)	115	Undrained (Phi=0)	750	0	0	22	Undrained (Phi=0)	750	0	750	0	-
Old Alluvial Deposits (Qoa) (Sand)	125	Mohr-Coulomb	50	34	50	34	Mohr-Coulomb	50	35	50	34	-
Old Alluvial Deposits (Qoa)	130	Mohr-Coulomb	50	36	50	36	Mohr-Coulomb	50	37	50	36	-
Old Alluvial Deposits (Qoa) (Gravelly Sand)	130	Mohr-Coulomb	0	36	0	36	Mohr-Coulomb	0	37	0	36	-
Del Mar Formation	135	Mohr-Coulomb	4000	0	0	36	Mohr-Coulomb	4000	0	4000	0	-

Minimum Factor of Safety Requirements:

Model Case	Minimum Factor of Safety
Static Short-Term	1.3
Static Long-Term	1.5
Post-Liquefaction	1.1
Rapid Drawdown	1.1

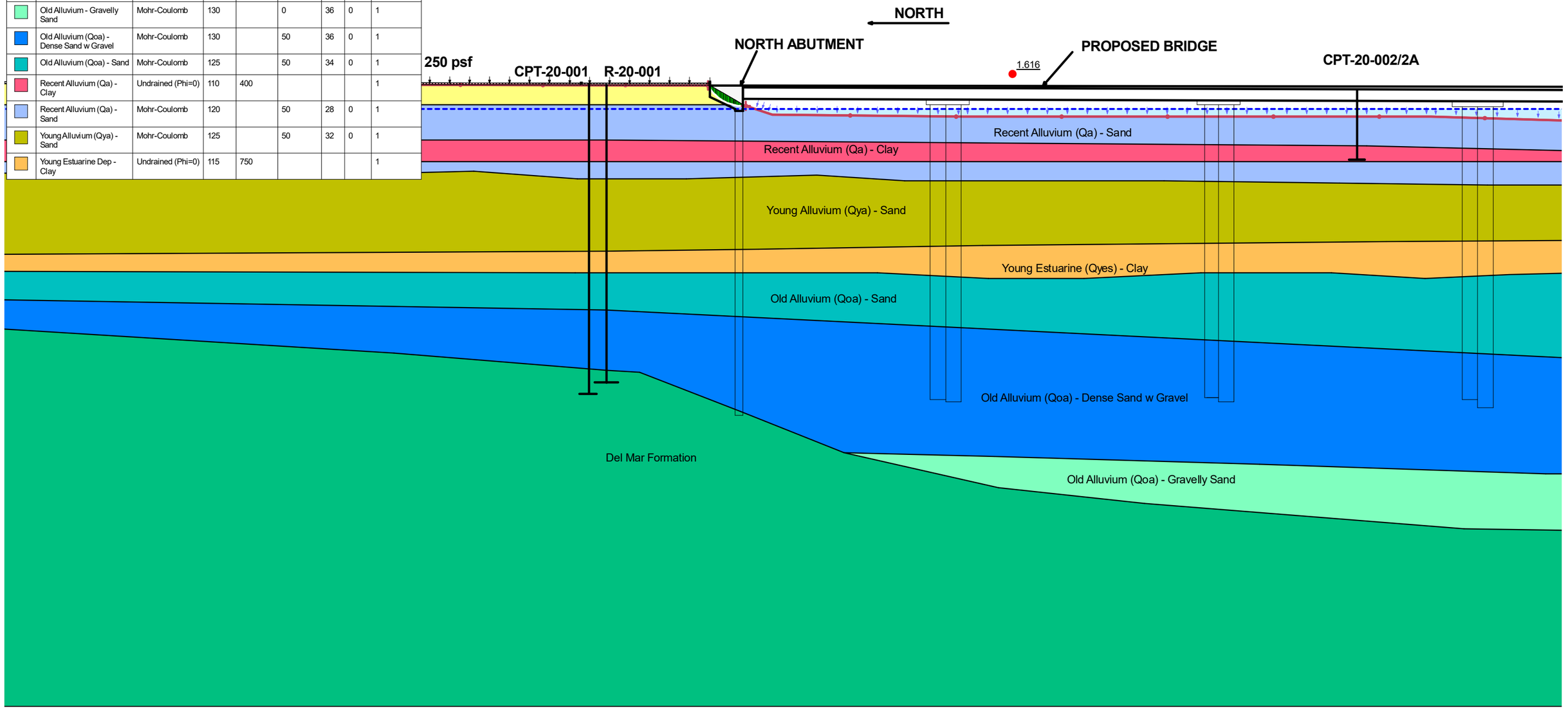
Static Slope Stability Results:

Case		Critical Factor of Safety
Static Short-Term	North Abutment	1.616
	South Abutment	1.515
Static Long-Term	North Abutment	1.861
	South Abutment	3.014
Post-Liquefaction	North Abutment	1.202
	South Abutment	1.363
Rapid Drawdown	North Abutment	1.534
	South Abutment	2.308

Seismic Slope Stability Results:

Case		Yield Coefficient	Median Seismic Slope Displacement
Yield Acceleration	North Abutment	0.049g	3.2 ft
	South Abutment	0.072g	2 ft

Color	Name	Model	Unit Weight (pcf)	Cohesion (psf)	Cohesion' (psf)	Phi' (°)	Phi-B (°)	Piezometric Line
	Artificial Fill	Mohr-Coulomb	120		50	33	0	1
	Del Mar Formation	Mohr-Coulomb	135		4,000	0	0	1
	Old Alluvium - Gravelly Sand	Mohr-Coulomb	130		0	36	0	1
	Old Alluvium (Qoa) - Dense Sand w Gravel	Mohr-Coulomb	130		50	36	0	1
	Old Alluvium (Qoa) - Sand	Mohr-Coulomb	125		50	34	0	1
	Recent Alluvium (Qa) - Clay	Undrained (Phi=0)	110	400				1
	Recent Alluvium (Qa) - Sand	Mohr-Coulomb	120		50	28	0	1
	Young Alluvium (Qya) - Sand	Mohr-Coulomb	125		50	32	0	1
	Young Estuarine Dep - Clay	Undrained (Phi=0)	115	750				1



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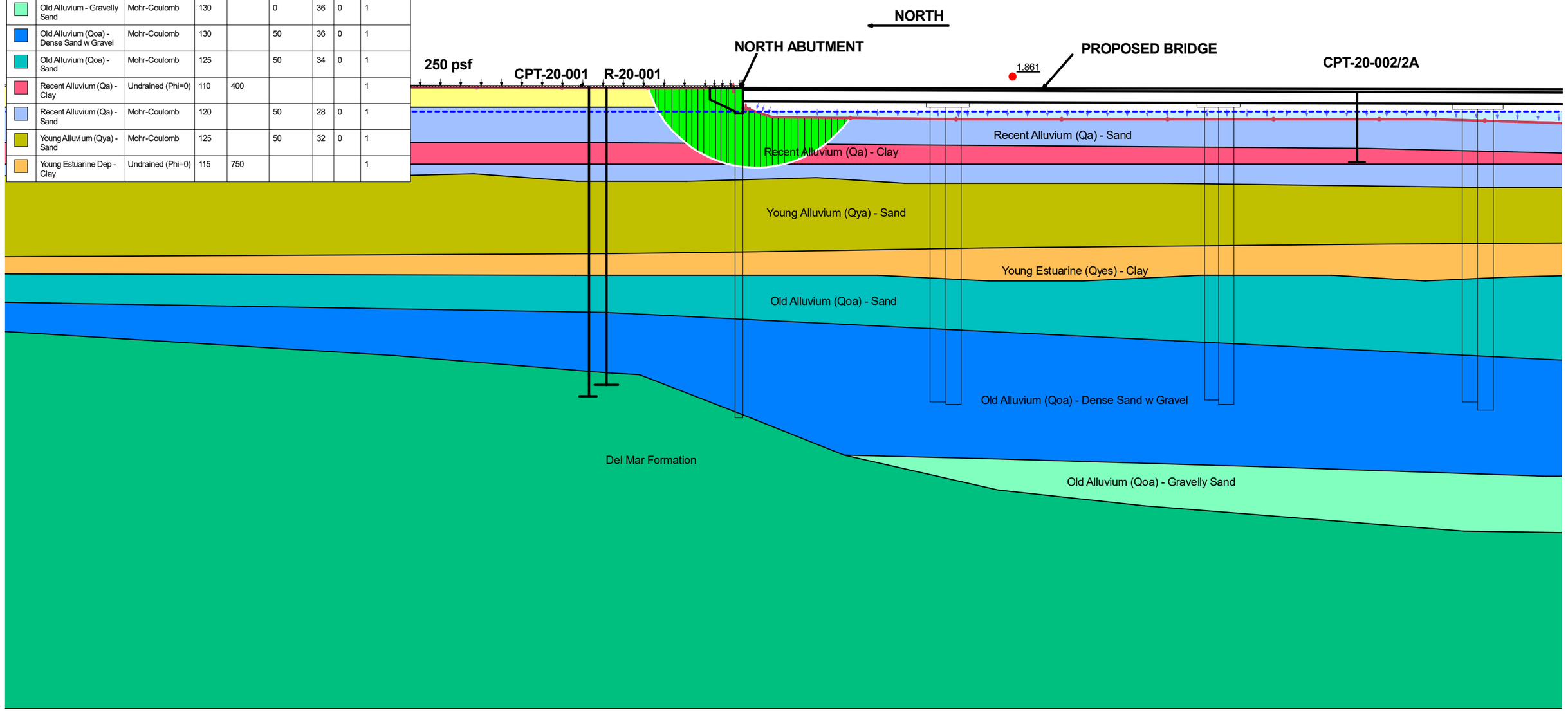
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SLOPE STABILITY ANALYSIS
NORTH ABUTMENT
SHORT-TERM STATIC ANALYSIS

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE:
1

Color	Name	Model	Unit Weight (pcf)	Cohesion (psf)	Cohesion' (psf)	Phi' (°)	Phi-B (°)	Piezometric Line
	Artificial Fill	Mohr-Coulomb	120		50	33	0	1
	Concrete	High Strength	150					1
	Del Mar Formation	Mohr-Coulomb	135		4,000	0	0	1
	Old Alluvium - Gravelly Sand	Mohr-Coulomb	130		0	36	0	1
	Old Alluvium (Qoa) - Dense Sand w Gravel	Mohr-Coulomb	130		50	36	0	1
	Old Alluvium (Qoa) - Sand	Mohr-Coulomb	125		50	34	0	1
	Recent Alluvium (Qa) - Clay	Undrained (Phi=0)	110	400				1
	Recent Alluvium (Qa) - Sand	Mohr-Coulomb	120		50	28	0	1
	Young Alluvium (Qya) - Sand	Mohr-Coulomb	125		50	32	0	1
	Young Estuarine Dep - Clay	Undrained (Phi=0)	115	750				1



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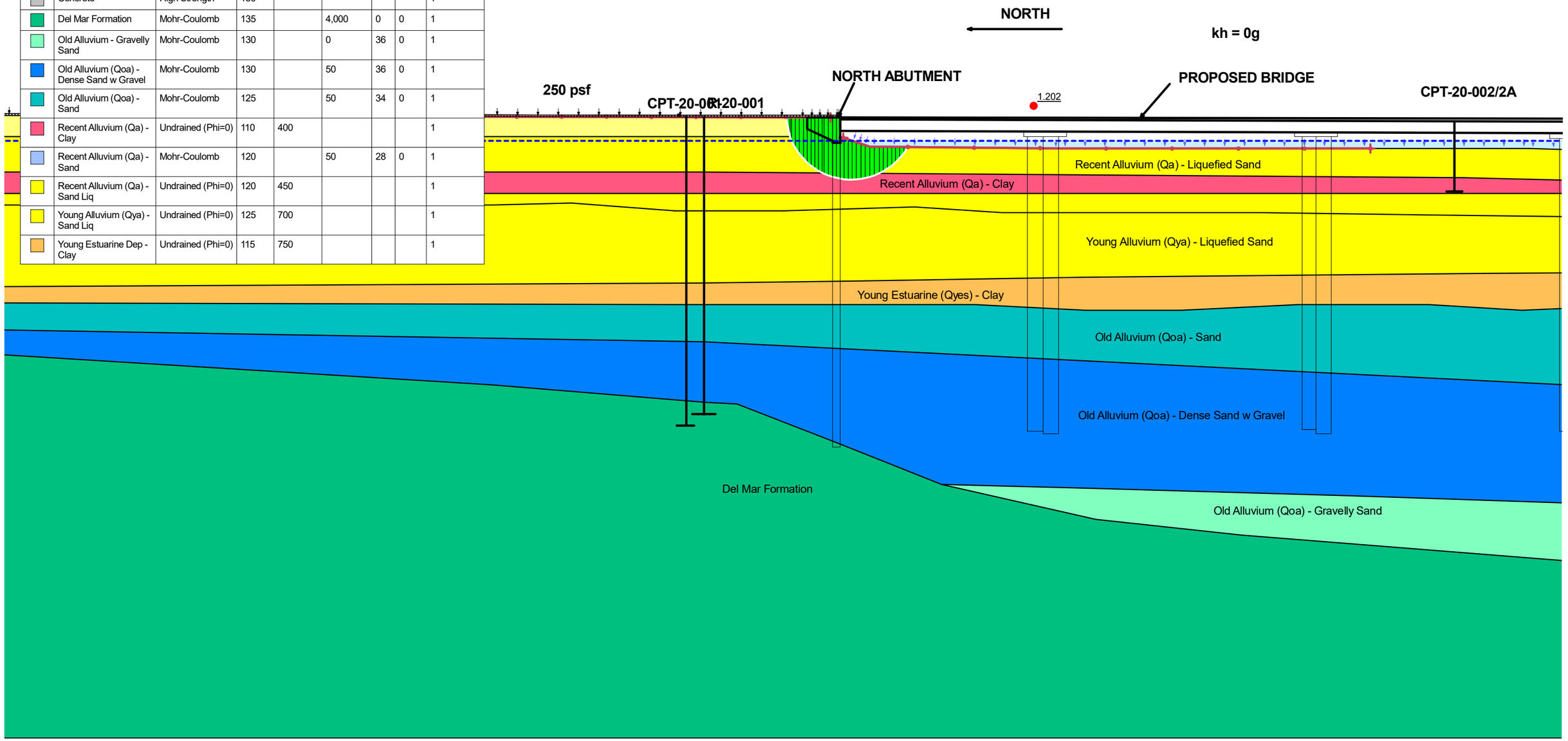
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SLOPE STABILITY ANALYSIS
NORTH ABUTMENT
LONG-TERM STATIC ANALYSIS

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE:
2

Color	Name	Model	Unit Weight (pcf)	Cohesion (psf)	Cohesion' (psf)	Phi' (°)	Phi-B (°)	Piezometric Line
	Artificial Fill	Mohr-Coulomb	120		50	33	0	1
	Concrete	High Strength	150					1
	Del Mar Formation	Mohr-Coulomb	135		4,000	0	0	1
	Old Alluvium - Gravelly Sand	Mohr-Coulomb	130		0	36	0	1
	Old Alluvium (Qoa) - Dense Sand w Gravel	Mohr-Coulomb	130		50	36	0	1
	Old Alluvium (Qoa) - Sand	Mohr-Coulomb	125		50	34	0	1
	Recent Alluvium (Qa) - Clay	Undrained (Phi=0)	110	400				1
	Recent Alluvium (Qa) - Sand	Mohr-Coulomb	120		50	28	0	1
	Recent Alluvium (Qa) - Sand Liq	Undrained (Phi=0)	120	450				1
	Young Alluvium (Qya) - Sand Liq	Undrained (Phi=0)	125	700				1
	Young Estuarine Dep - Clay	Undrained (Phi=0)	115	750				1



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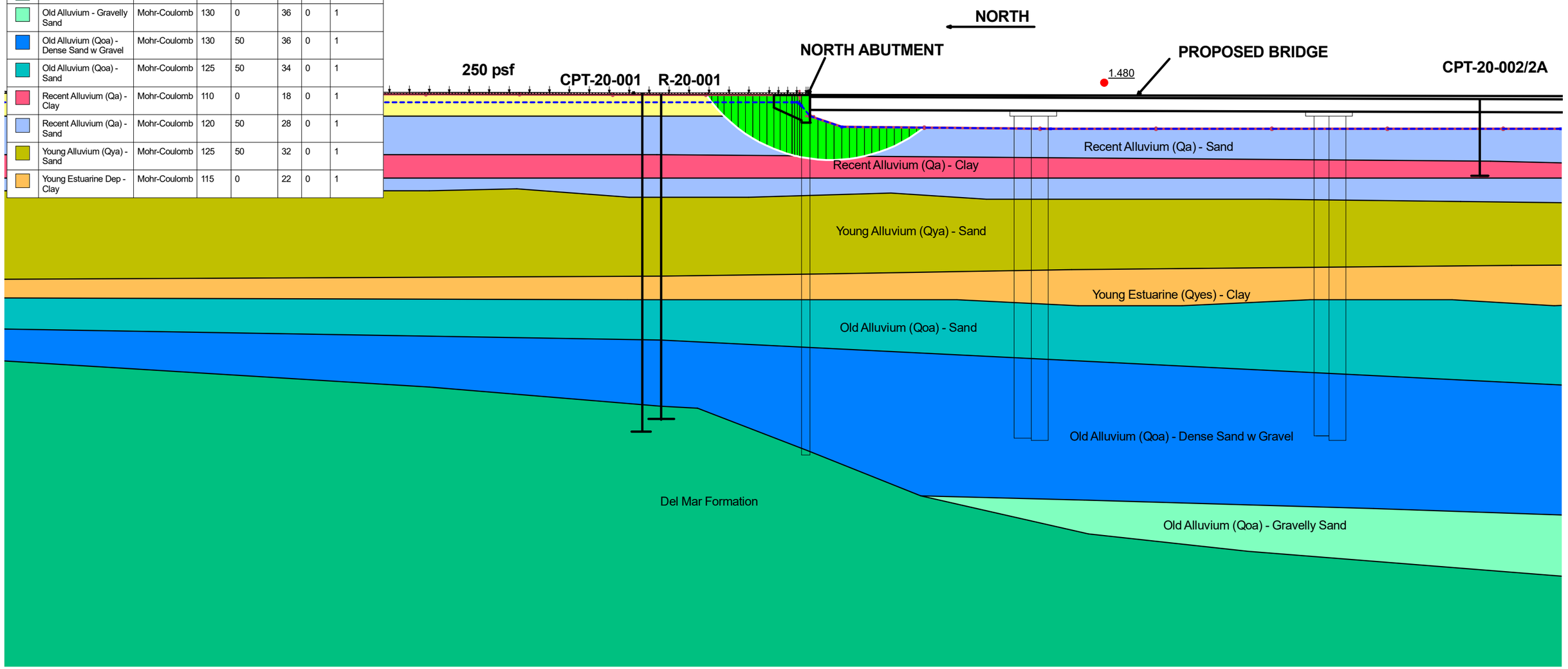
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SLOPE STABILITY ANALYSIS
NORTH ABUTMENT
POST-LIQUEFACTION ANALYSIS

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE:
3

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Phi-B (°)	Piezometric Line
	Artificial Fill	Mohr-Coulomb	120	50	33	0	1
	Concrete	High Strength	150				1
	Del Mar Formation	Mohr-Coulomb	135	0	36	0	1
	Old Alluvium - Gravelly Sand	Mohr-Coulomb	130	0	36	0	1
	Old Alluvium (Qoa) - Dense Sand w Gravel	Mohr-Coulomb	130	50	36	0	1
	Old Alluvium (Qoa) - Sand	Mohr-Coulomb	125	50	34	0	1
	Recent Alluvium (Qa) - Clay	Mohr-Coulomb	110	0	18	0	1
	Recent Alluvium (Qa) - Sand	Mohr-Coulomb	120	50	28	0	1
	Young Alluvium (Qya) - Sand	Mohr-Coulomb	125	50	32	0	1
	Young Estuarine Dep - Clay	Mohr-Coulomb	115	0	22	0	1



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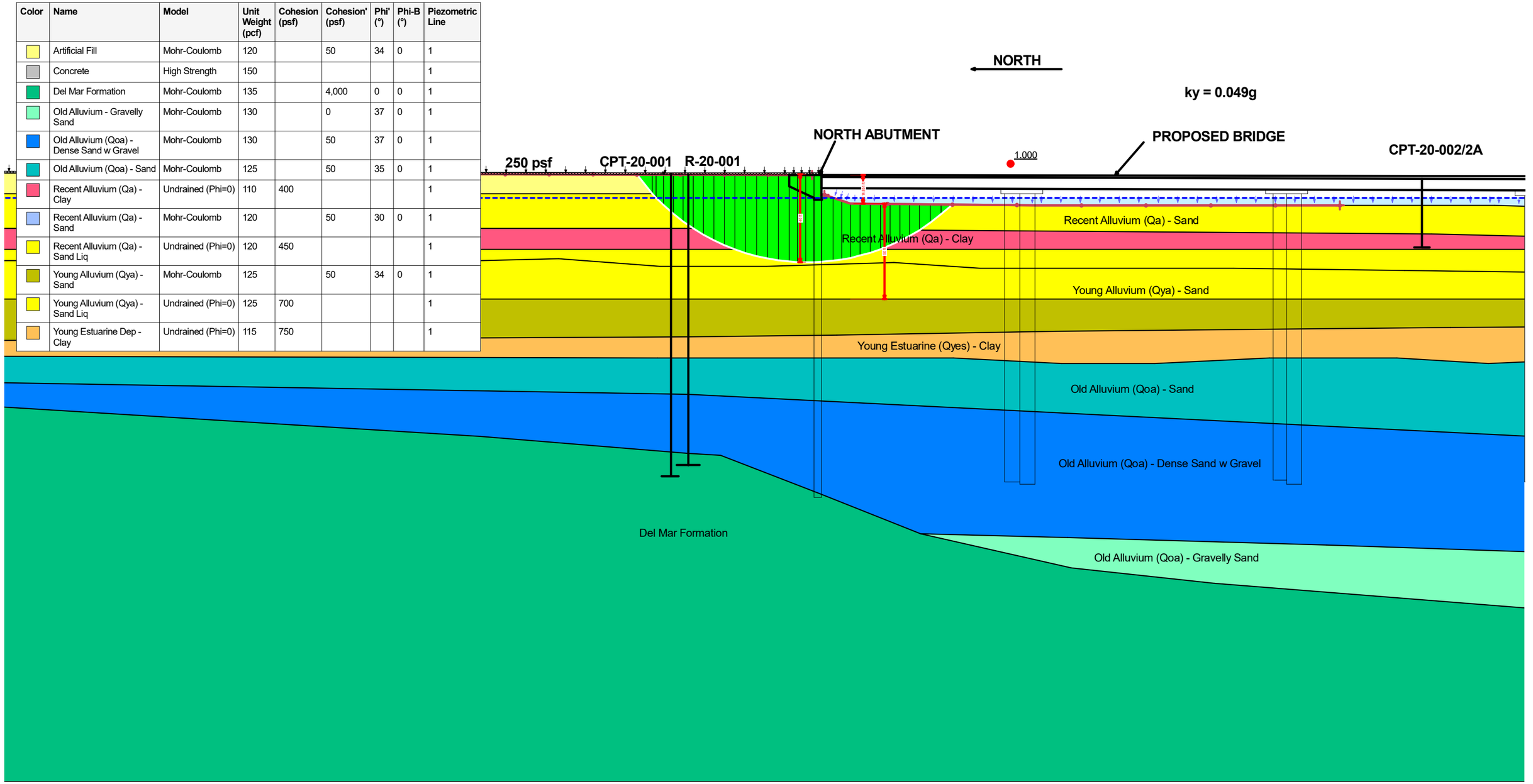
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SLOPE STABILITY ANALYSIS
NORTH ABUTMENT DESIGN FLOOD LEVEL RAPID DRAWDOWN

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE:
4

Color	Name	Model	Unit Weight (pcf)	Cohesion (psf)	Cohesion' (psf)	Phi' (°)	Phi-B (°)	Piezometric Line
	Artificial Fill	Mohr-Coulomb	120		50	34	0	1
	Concrete	High Strength	150					1
	Del Mar Formation	Mohr-Coulomb	135		4,000	0	0	1
	Old Alluvium - Gravelly Sand	Mohr-Coulomb	130		0	37	0	1
	Old Alluvium (Qoa) - Dense Sand w Gravel	Mohr-Coulomb	130		50	37	0	1
	Old Alluvium (Qoa) - Sand	Mohr-Coulomb	125		50	35	0	1
	Recent Alluvium (Qa) - Clay	Undrained (Phi=0)	110	400				1
	Recent Alluvium (Qa) - Sand	Mohr-Coulomb	120		50	30	0	1
	Recent Alluvium (Qa) - Sand Liq	Undrained (Phi=0)	120	450				1
	Young Alluvium (Qya) - Sand	Mohr-Coulomb	125		50	34	0	1
	Young Alluvium (Qya) - Sand Liq	Undrained (Phi=0)	125	700				1
	Young Estuarine Dep - Clay	Undrained (Phi=0)	115	750				1



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SLOPE STABILITY ANALYSIS
NORTH ABUTMENT
PSEUDO-STATIC YIELD COEFFICIENT

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE:
5

North Abutment Seismic Slope Displacements

Simplified Procedure for Estimating Earthquake Induced Deviatoric Slope Displacements
by Jonathan D. Bray and Thaleia Travasarou
Journal of Geotechnical and Geonvironmental Engineering, ASCE, V. 133(4), pp. 381-392, April 2007

SEE NOTES BELOW FOR GUIDANCE IN THE USE OF SPREADSHEET

Input Parameters			
Yield Coefficient (ky)	0.049		Based on pseudostatic analysis
Initial Fundamental Period (Ts)	0.26	seconds	1D: Ts=4H/Vs 2D: Ts=2.6H/Vs
Degraded Period (1.5Ts)	0.39	seconds	
Moment Magnitude (Mw)	6.6		
Spectral Acceleration (Sa(1.5Ts))	0.913	g	

Additional Input Parameters		
Probability of Exceedance #1 (P1)	84	%
Probability of Exceedance #2 (P2)	50	%
Probability of Exceedance #3 (P3)	16	%
Displacement Threshold (d_threshold)	15.24	cm

Intermediate Calculated Parameters			
Non-Zero Seismic Displacement Est (D)	96.49	cm	eq. (5) or (6)
Standard Deviation of Non-Zero Seismic D	0.66		

Results			
Probability of Negligible Displ. (P(D=0))	0.000		eq. (3)
D1	50.05	cm	calc. using eq. (7)
D2	96.49	cm	calc. using eq. (7)
D3	186.01	cm	calc. using eq. (7)
P(D>d_threshold)	0.997		eq. (7)

Notes

1. Values highlighted in blue are input parameters
2. Probability of Exceedance is the desired probability of exceeding a particular displacement value.
3. Displacements D1, D2, and D3 correspond to P1, P2, and P3, respectively.
   (e.g., the probability of exceeding displacement D1 is P1)
4. Calculated seismic displacements are due to deviatoric deformation only (add in volumetrically induced movement).
5. ky may range between 0.01 and 0.5, Ts between 0 and 2 s, Sa between 0.002 and 2.7 g, M between 4.5 and 9
6. Rigid slope is assumed for Ts < 0.05 s
7. When a value for D is not calculated, D is < 1cm
8. ky may be estimated using the simplified equations shown below.
9. Examples of how Ts is estimated are shown below.
10. Vs = weighted avg. shear wave velocity for the sliding mass, e.g., for 2 layers, Vs = [(h1)(Vs1) + (h2)(Vs2)]/(h1 + h2)

Median slope displacement = 96.5 cm = 38 inches = 3.2 ft

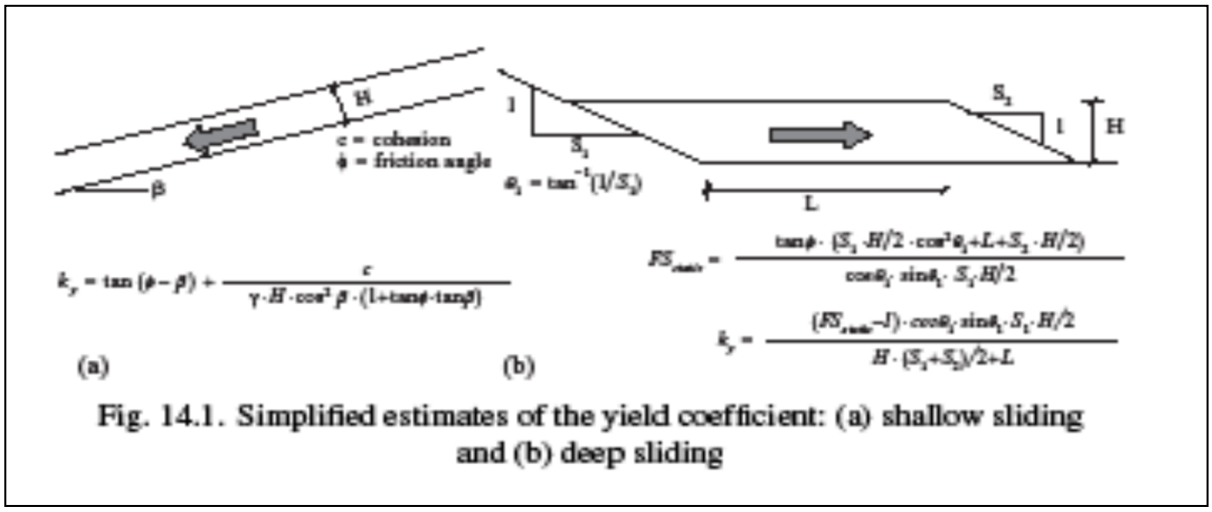


Fig. 14.1. Simplified estimates of the yield coefficient: (a) shallow sliding and (b) deep sliding

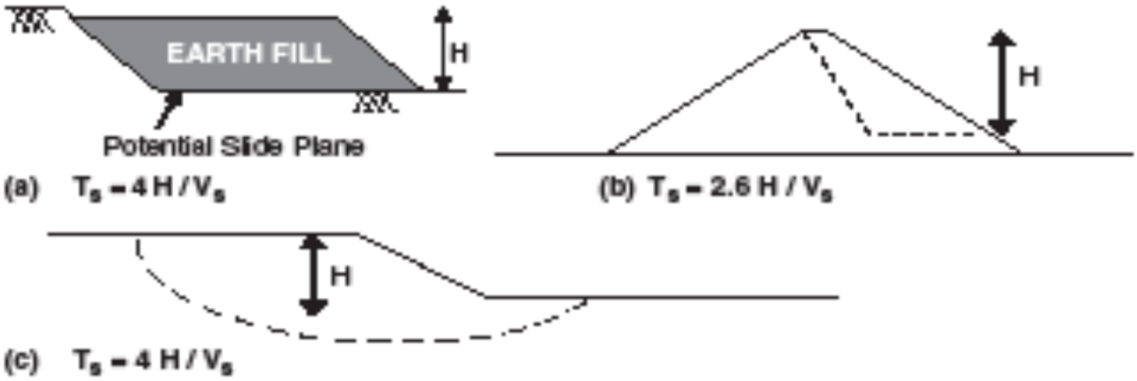
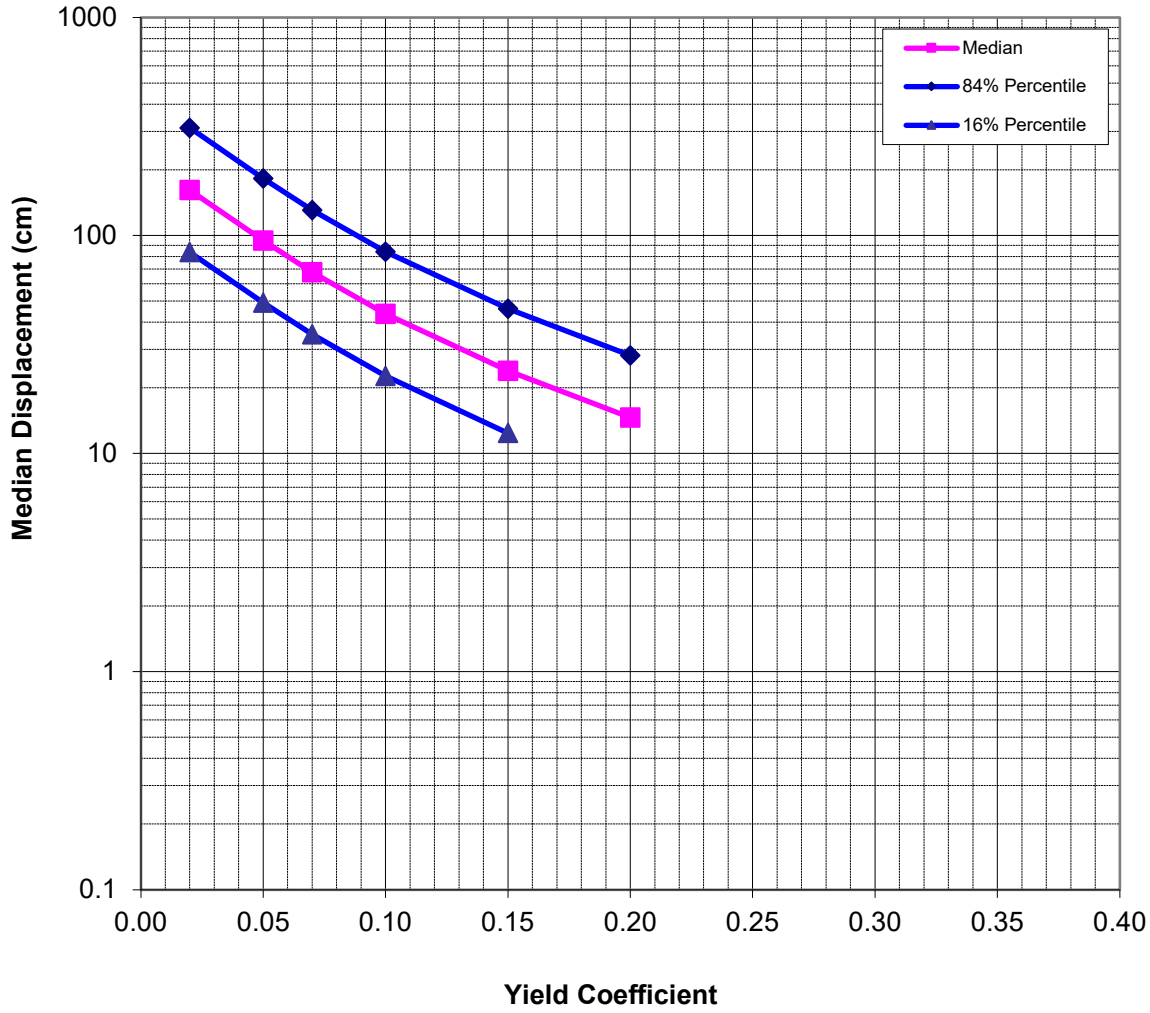


Fig. 14.4. Estimating the initial fundamental period of potential sliding blocks

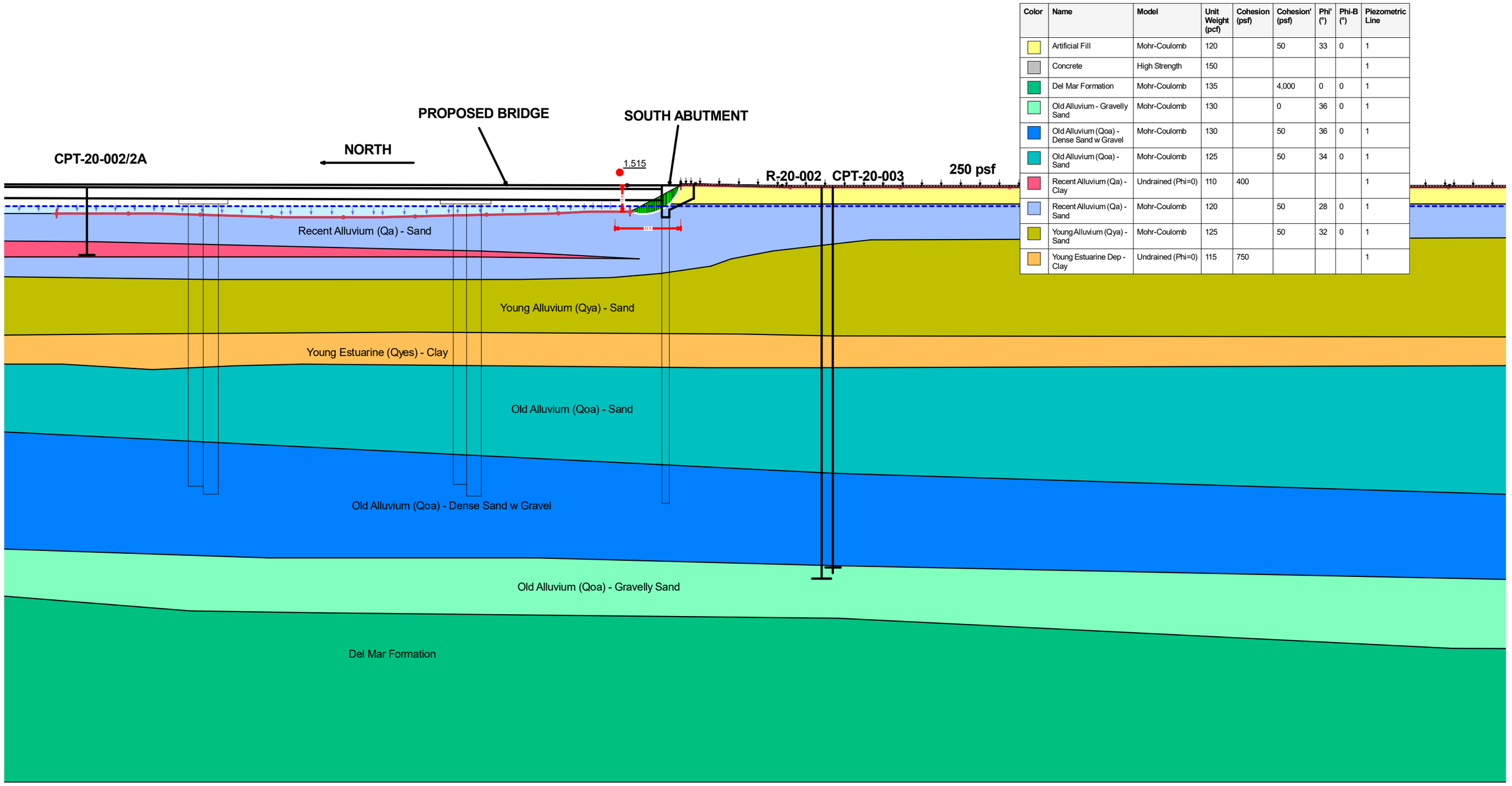
Figures from Bray, J.D. (2007) “Chapter 14: Simplified Seismic Slope Displacement Procedures,” Earthquake Geotechnical Engineering, 4th Inter. Conf. on Earthquake Geotechnical Engineering - Invited Lectures, in Geotechnical, Geological, and Earthquake Engineering Series, Vol. 6, Pitilakis, Kyriazis D., Ed., Springer, Vol. 6, pp. 327-353.

Dependence on ky

ky	P(D="0")	D (cm)	Dmedian (cm)	D1 (cm)	D3 (cm)
0.020	0.00	161.5	161.5	311.2	83.8
0.05	0.00	94.8	94.8	182.7	49.2
0.07	0.00	67.7	67.7	130.6	35.1
0.1	0.00	43.7	43.7	84.2	22.7
0.15	0.00	24.0	24.0	46.2	12.4
0.2	0.00	14.6	14.6	28.2	7.6
0.3	0.03	6.6	6.5	12.7	3.2
0.4	0.16	3.6	3.0	6.3	<1



Simplified Procedure for Estimating Earthquake Induced Deviatoric Slope Displacements
by Jonathan D. Bray and Thaleia Travasarou
Journal of Geotechnical and Geonvironmental Engineering, Vol 133, No. 4, pp. 381-392, April 2007



Color	Name	Model	Unit Weight (pcf)	Cohesion (psf)	Cohesion' (psf)	Phi' (°)	Phi-B (°)	Piezometric Line
	Artificial Fill	Mohr-Coulomb	120		50	33	0	1
	Concrete	High Strength	150					1
	Del Mar Formation	Mohr-Coulomb	135		4,000	0	0	1
	Old Alluvium - Gravelly Sand	Mohr-Coulomb	130		0	36	0	1
	Old Alluvium (Qoa) - Dense Sand w Gravel	Mohr-Coulomb	130		50	36	0	1
	Old Alluvium (Qoa) - Sand	Mohr-Coulomb	125		50	34	0	1
	Recent Alluvium (Qa) - Clay	Undrained (Phi=0)	110	400				1
	Recent Alluvium (Qa) - Sand	Mohr-Coulomb	120		50	28	0	1
	Young Alluvium (Qya) - Sand	Mohr-Coulomb	125		50	32	0	1
	Young Estuarine Dep - Clay	Undrained (Phi=0)	115	750				1

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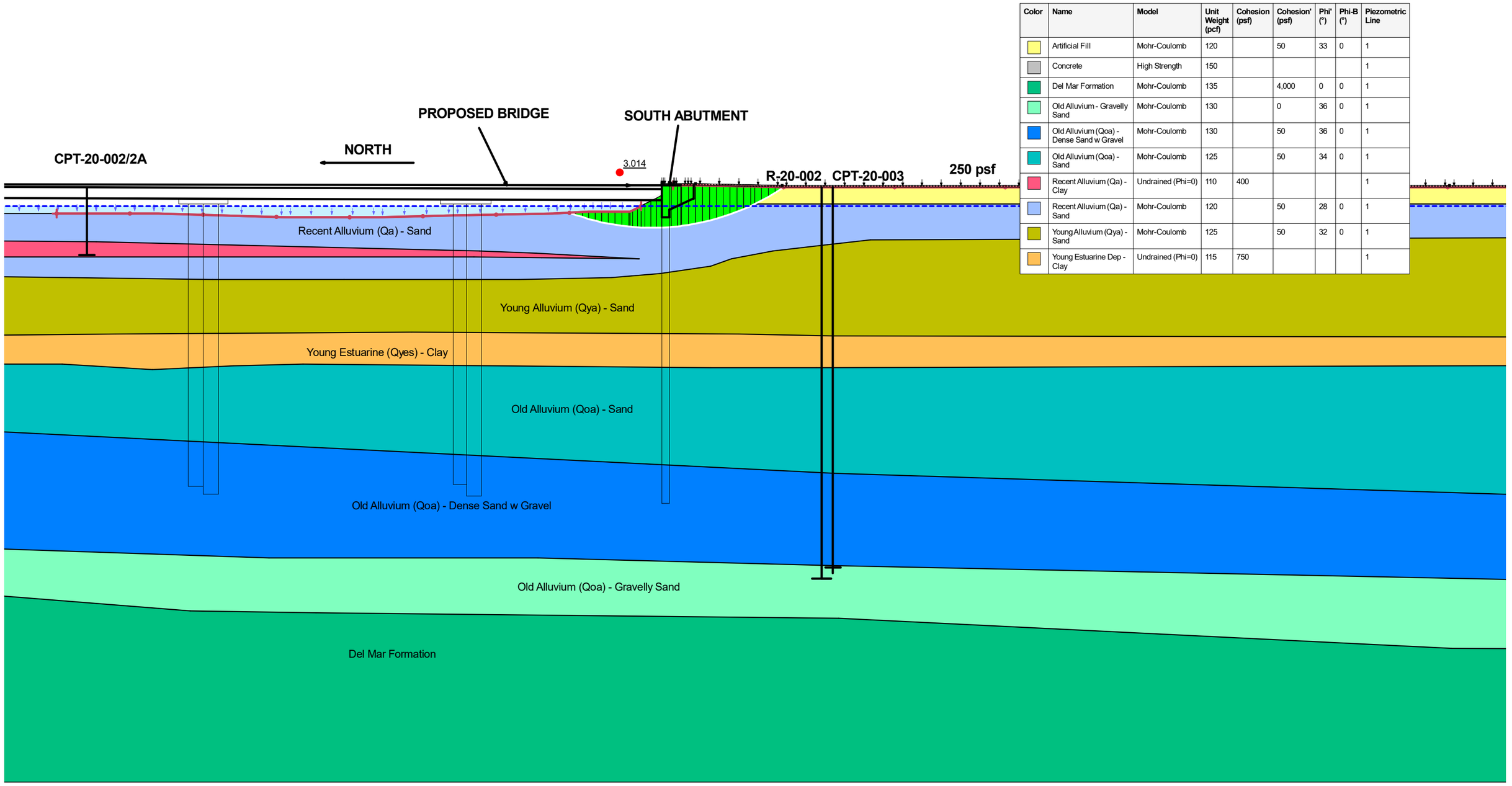
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SLOPE STABILITY ANALYSIS
SOUTH ABUTMENT
SHORT-TERM STATIC ANALYSIS

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE:
6



Color	Name	Model	Unit Weight (pcf)	Cohesion (psf)	Cohesion' (psf)	Phi' (°)	Phi-B (°)	Piezometric Line
	Artificial Fill	Mohr-Coulomb	120		50	33	0	1
	Concrete	High Strength	150					1
	Del Mar Formation	Mohr-Coulomb	135		4,000	0	0	1
	Old Alluvium - Gravelly Sand	Mohr-Coulomb	130		0	36	0	1
	Old Alluvium (Qoa) - Dense Sand w Gravel	Mohr-Coulomb	130		50	36	0	1
	Old Alluvium (Qoa) - Sand	Mohr-Coulomb	125		50	34	0	1
	Recent Alluvium (Qa) - Clay	Undrained (Phi=0)	110	400				1
	Recent Alluvium (Qa) - Sand	Mohr-Coulomb	120		50	28	0	1
	Young Alluvium (Qya) - Sand	Mohr-Coulomb	125		50	32	0	1
	Young Estuarine Dep - Clay	Undrained (Phi=0)	115	750				1

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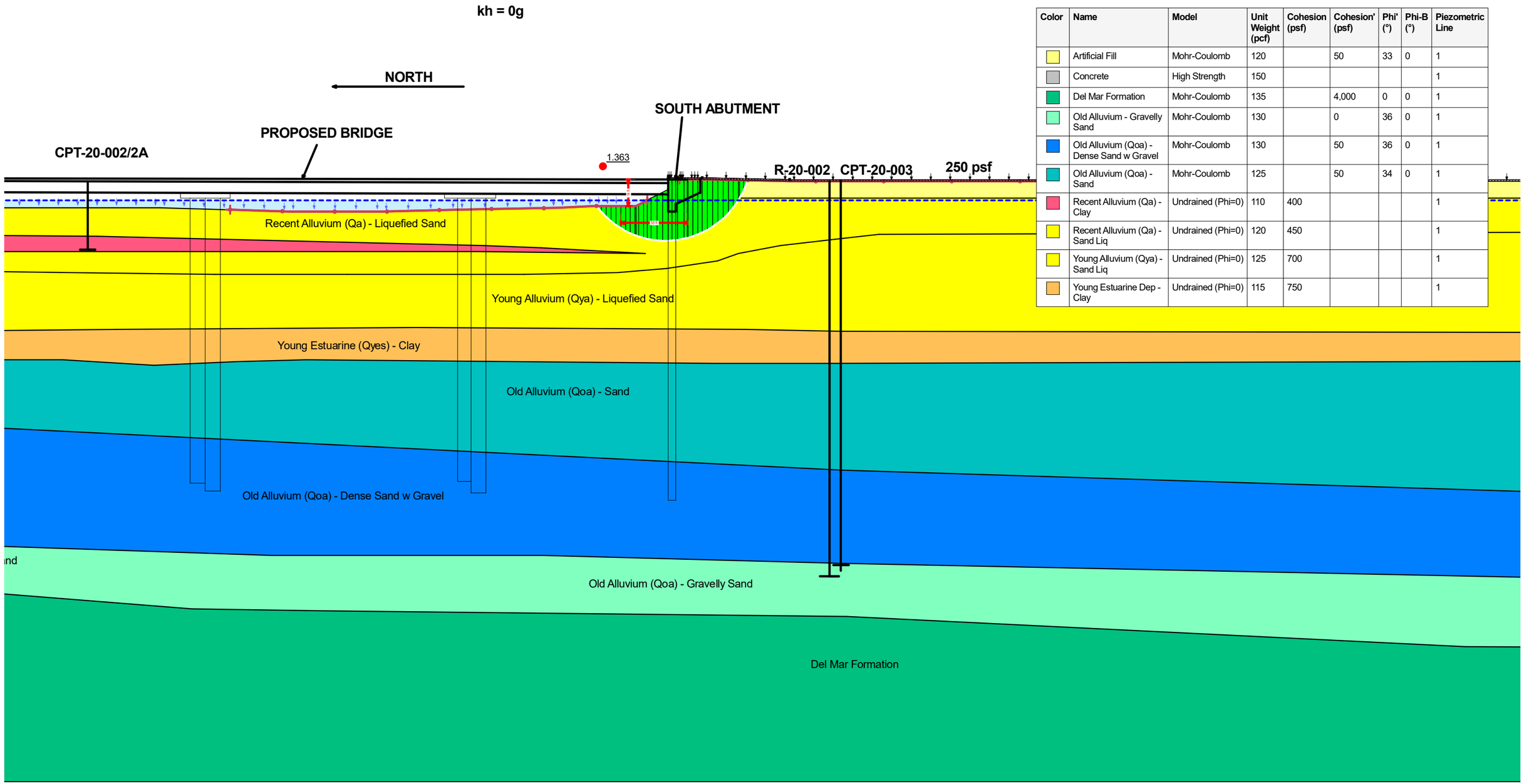
PROJECT NO.	20180876.001A
DRAWN:	04/2020
DRAWN BY:	JLB
CHECKED BY:	KR
FILE NAME:	-

SLOPE STABILITY ANALYSIS
SOUTH ABUTMENT
LONG-TERM STATIC ANALYSIS

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE:
7

kh = 0g



Color	Name	Model	Unit Weight (pcf)	Cohesion (psf)	Cohesion' (psf)	Phi' (°)	Phi-B (°)	Piezometric Line
	Artificial Fill	Mohr-Coulomb	120		50	33	0	1
	Concrete	High Strength	150					1
	Del Mar Formation	Mohr-Coulomb	135		4,000	0	0	1
	Old Alluvium - Gravelly Sand	Mohr-Coulomb	130		0	36	0	1
	Old Alluvium (Qoa) - Dense Sand w Gravel	Mohr-Coulomb	130		50	36	0	1
	Old Alluvium (Qoa) - Sand	Mohr-Coulomb	125		50	34	0	1
	Recent Alluvium (Qa) - Clay	Undrained (Phi=0)	110	400				1
	Recent Alluvium (Qa) - Sand Liq	Undrained (Phi=0)	120	450				1
	Young Alluvium (Qya) - Sand Liq	Undrained (Phi=0)	125	700				1
	Young Estuarine Dep - Clay	Undrained (Phi=0)	115	750				1

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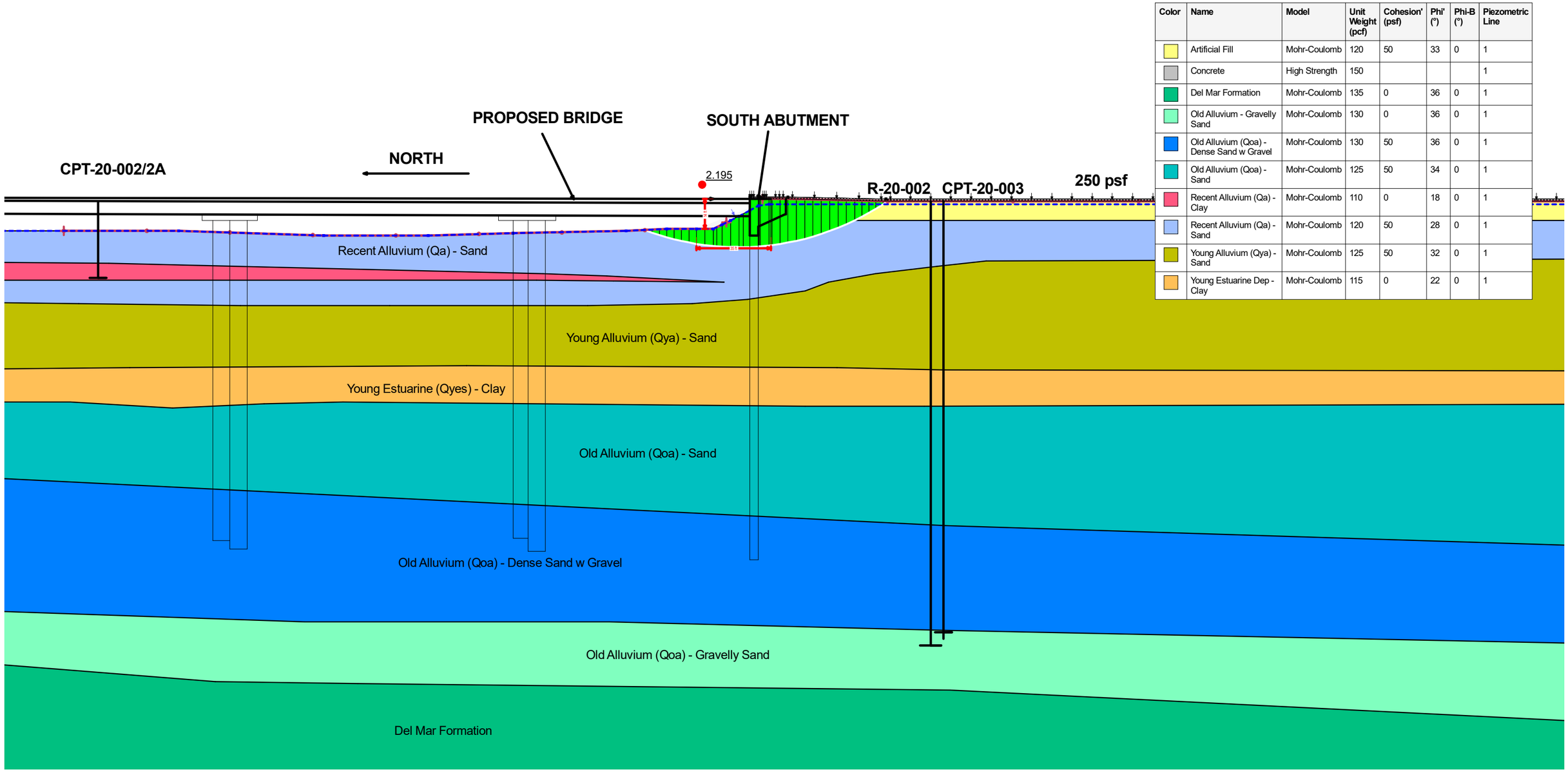
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SLOPE STABILITY ANALYSIS
SOUTH ABUTMENT
POST-LIQUEFACTION ANALYSIS

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE:
8



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Phi-B (°)	Piezometric Line
	Artificial Fill	Mohr-Coulomb	120	50	33	0	1
	Concrete	High Strength	150				1
	Del Mar Formation	Mohr-Coulomb	135	0	36	0	1
	Old Alluvium - Gravelly Sand	Mohr-Coulomb	130	0	36	0	1
	Old Alluvium (Qoa) - Dense Sand w Gravel	Mohr-Coulomb	130	50	36	0	1
	Old Alluvium (Qoa) - Sand	Mohr-Coulomb	125	50	34	0	1
	Recent Alluvium (Qa) - Clay	Mohr-Coulomb	110	0	18	0	1
	Recent Alluvium (Qa) - Sand	Mohr-Coulomb	120	50	28	0	1
	Young Alluvium (Qya) - Sand	Mohr-Coulomb	125	50	32	0	1
	Young Estuarine Dep - Clay	Mohr-Coulomb	115	0	22	0	1

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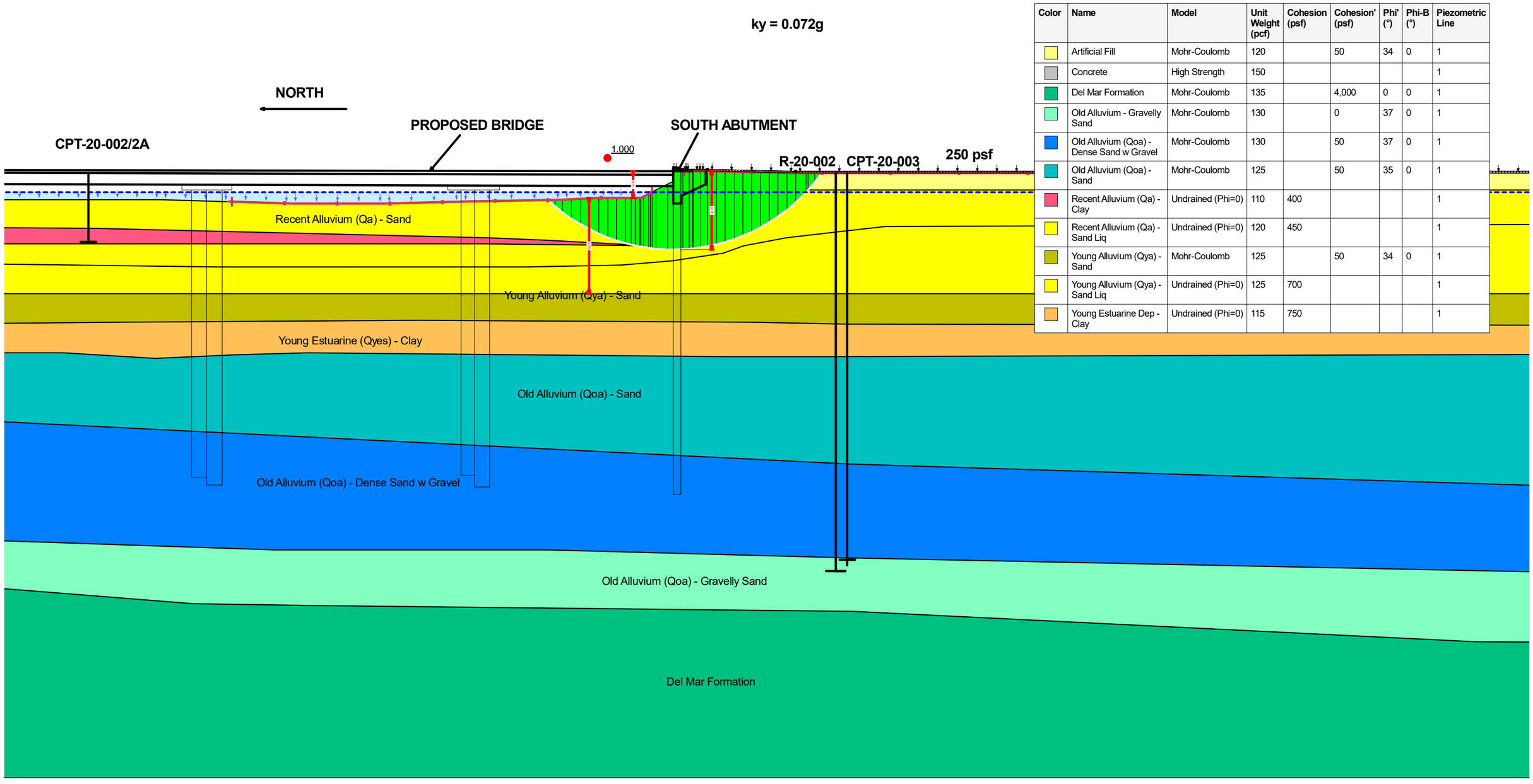
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SLOPE STABILITY ANALYSIS
SOUTH ABUTMENT DESIGN FLOOD LEVEL
RAPID DRAWDOWN

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE:
9



Color	Name	Model	Unit Weight (pcf)	Cohesion (psf)	Cohesion' (psf)	Phi' (°)	Phi-B (°)	Piezometric Line
	Artificial Fill	Mohr-Coulomb	120		50	34	0	1
	Concrete	High Strength	150					1
	Del Mar Formation	Mohr-Coulomb	135		4,000	0	0	1
	Old Alluvium - Gravelly Sand	Mohr-Coulomb	130		0	37	0	1
	Old Alluvium (Qoa) - Dense Sand w Gravel	Mohr-Coulomb	130		50	37	0	1
	Old Alluvium (Qoa) - Sand	Mohr-Coulomb	125		50	35	0	1
	Recent Alluvium (Qa) - Clay	Undrained (Phi=0)	110	400				1
	Recent Alluvium (Qa) - Sand Liq	Undrained (Phi=0)	120	450				1
	Young Alluvium (Qya) - Sand	Mohr-Coulomb	125		50	34	0	1
	Young Alluvium (Qya) - Sand Liq	Undrained (Phi=0)	125	700				1
	Young Estuarine Dep - Clay	Undrained (Phi=0)	115	750				1

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SLOPE STABILITY ANALYSIS
SOUTH ABUTMENT
PSEUDO-STATIC YIELD COEFFICIENT

CAMINO DEL MAR BRIDGE REPLACEMENT
OVER SAN DIEGUITO RIVER - PHASE 0
DEL MAR, CALIFORNIA

FIGURE:
10

South Abutment Seismic Slope Displacements

Simplified Procedure for Estimating Earthquake Induced Deviatoric Slope Displacements
by Jonathan D. Bray and Thaleia Travasarou
Journal of Geotechnical and Geonvironmental Engineering, ASCE, V. 133(4), pp. 381-392, April 2007

SEE NOTES BELOW FOR GUIDANCE IN THE USE OF SPREADSHEET

Input Parameters			
Yield Coefficient (ky)	0.072		Based on pseudostatic analysis
Initial Fundamental Period (Ts)	0.23	seconds	1D: Ts=4H/Vs 2D: Ts=2.6H/Vs
Degraded Period (1.5Ts)	0.35	seconds	
Moment Magnitude (Mw)	6.6		
Spectral Acceleration (Sa(1.5Ts))	0.9	g	

Additional Input Parameters		
Probability of Exceedance #1 (P1)	84	%
Probability of Exceedance #2 (P2)	50	%
Probability of Exceedance #3 (P3)	16	%
Displacement Threshold (d_threshold)	15.24	cm

Intermediate Calculated Parameters			
Non-Zero Seismic Displacement Est (D)	61.49	cm	eq. (5) or (6)
Standard Deviation of Non-Zero Seismic D	0.66		

Results			
Probability of Negligible Displ. (P(D=0))	0.000		eq. (3)
D1	31.90	cm	calc. using eq. (7)
D2	61.49	cm	calc. using eq. (7)
D3	118.54	cm	calc. using eq. (7)
P(D>d_threshold)	0.983		eq. (7)

Notes

1. Values highlighted in blue are input parameters
2. Probability of Exceedance is the desired probability of exceeding a particular displacement value.
3. Displacements D1, D2, and D3 correspond to P1, P2, and P3, respectively.
   (e.g., the probability of exceeding displacement D1 is P1)
4. Calculated seismic displacements are due to deviatoric deformation only (add in volumetrically induced movement).
5. ky may range between 0.01 and 0.5, Ts between 0 and 2 s, Sa between 0.002 and 2.7 g, M between 4.5 and 9
6. Rigid slope is assumed for Ts < 0.05 s
7. When a value for D is not calculated, D is < 1cm
8. ky may be estimated using the simplified equations shown below.
9. Examples of how Ts is estimated are shown below.
10. Vs = weighted avg. shear wave velocity for the sliding mass, e.g., for 2 layers, Vs = [(h1)(Vs1) + (h2)(Vs2)]/(h1 + h2)

Median slope displacement = 61.5 cm = 24 inches = 2 ft

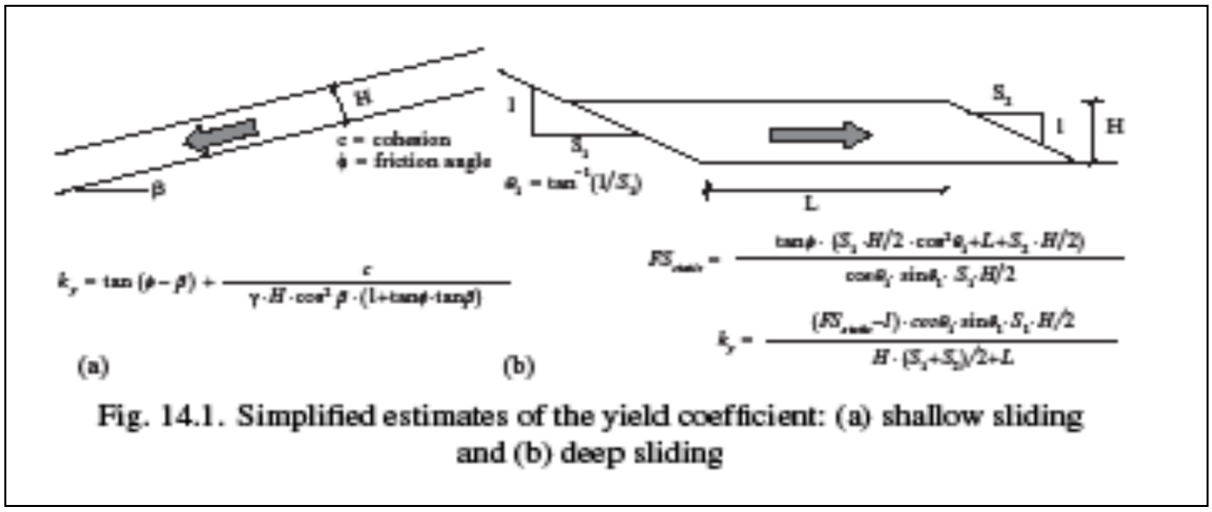


Fig. 14.1. Simplified estimates of the yield coefficient: (a) shallow sliding and (b) deep sliding

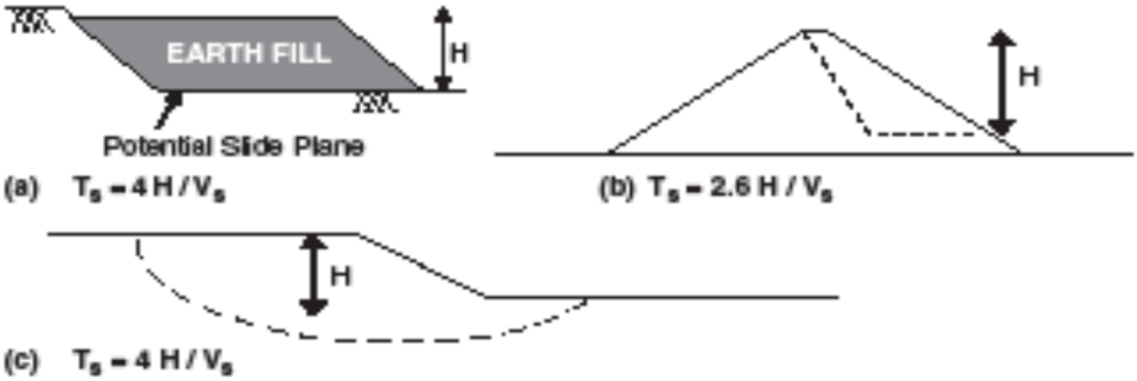
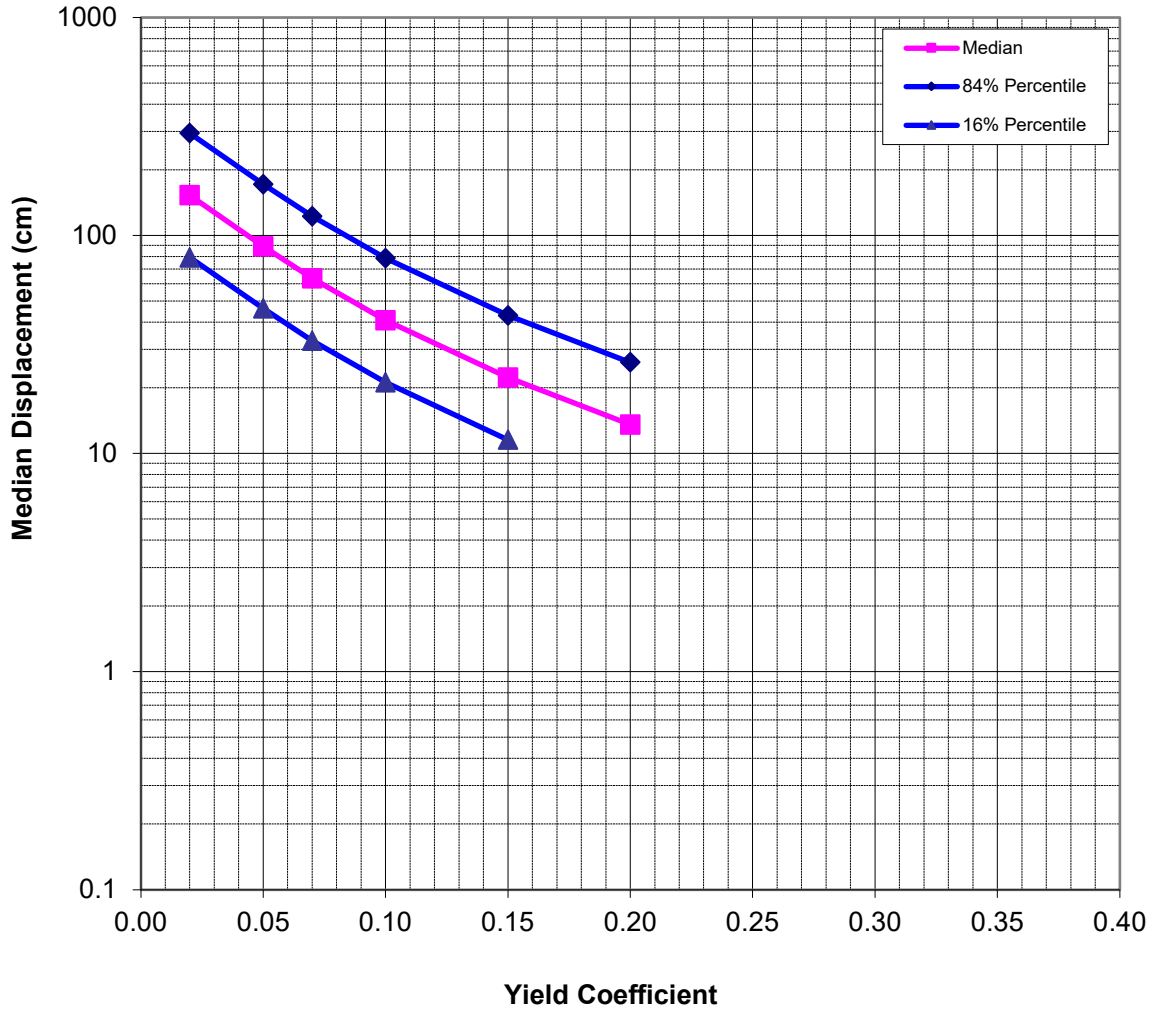


Fig. 14.4. Estimating the initial fundamental period of potential sliding blocks

Figures from Bray, J.D. (2007) “Chapter 14: Simplified Seismic Slope Displacement Procedures,” Earthquake Geotechnical Engineering, 4th Inter. Conf. on Earthquake Geotechnical Engineering - Invited Lectures, in Geotechnical, Geological, and Earthquake Engineering Series, Vol. 6, Pitilakis, Kyriazis D., Ed., Springer, Vol. 6, pp. 327-353.

Dependence on ky

ky	P(D="0")	D (cm)	Dmedian (cm)	D1 (cm)	D3 (cm)
0.020	0.00	152.8	152.8	294.6	79.3
0.05	0.00	89.1	89.1	171.7	46.2
0.07	0.00	63.5	63.5	122.4	32.9
0.1	0.00	40.8	40.8	78.7	21.2
0.15	0.00	22.3	22.3	43.0	11.6
0.2	0.00	13.6	13.6	26.2	7.0
0.3	0.03	6.2	6.0	11.7	3.0
0.4	0.18	3.3	2.7	5.8	<1



Simplified Procedure for Estimating Earthquake Induced Deviatoric Slope Displacements
by Jonathan D. Bray and Thaleia Travasarou
Journal of Geotechnical and Geonvironmental Engineering, Vol 133, No. 4, pp. 381-392, April 2007

G.5 AXIAL PILE CAPACITY ANALYSES

Strength Parameters for Axial Pile Capacity Analysis

NORTH ABUTMENT SUBSURFACE PARAMETERS USED IN AXIAL CAPACITY ANALYSES

Layer	Top Depth (ft)	Bottom Depth (ft)	Top Elev (ft)	Bottom Elev (ft)	Soil Model	Total Unit Weight	Friction Angle	Avg N Value	Top Beta, β	Bottom Beta, β	Adhesion factor, α	Undrained Shear Strength, Su (psf)	Steel Casing Reduction Factor[1]
1 - Artificial Fill	0	9	16	7	FHWA Sand	120	34	15	1.2	1.095	-	-	0
2 - Recent Alluvium (Qoa) (Sand)	9	28	7	-12	FHWA Sand	120	28	10	0.73	0.524	-	-	0
3 - Recent Alluvium (Qoa) (Clay)	28	39	-12	-23	FHWA Clay	110	-	-	-	-	0.55	400	0
4 - Recent Alluvium (Qoa) (Sand)	39	48	-23	-32	FHWA Sand	120	28	10	0.438	0.376	-	-	0
5 - Young Alluvium (Qya) (Sand)	48	85	-32	-69	FHWA Sand	125	32	30	0.565	0.255	-	-	0
6 - Young Estuarine (Qyes) (Clay)	85	95	-69	-79	FHWA Clay	115	-	-	-	-	0.55	750	0
7 - Old Alluvium (Qoa) (Sand)	95	116	-79	-100	FHWA Sand	125	34	25	0.25	0.25	-	-	1
8 - Old Alluvium (Qoa) (Sand w	116	146	-100	-130	FHWA Sand	130	36	35	0.25	0.25	-	-	1
9 - Del Mar Formation	146	266	-130	-250	FHWA Clay	135	-	-	-	-	0.51	4000	1

[1]Assumes casing extends to top of Old alluvial deposits for constructability. Geotechnical capacities are negelected for permanent steel smooth-wall casing per Caltrans Guildelines.

PIER SUBSURFACE PARAMETERS USED IN AXIAL CAPACITY ANALYSES

Layer	Top Depth (ft)	Bottom Depth (ft)	Top Elev (ft)	Bottom Elev (ft)	Top Depth from Pile Cut Off (ft)	Bottom Depth from Pile Cut Off (ft)	Soil Model	Total Unit Weight	Friction Angle*	Avg N Value	Top Beta, β	Bottom Beta, β	Adhesion factor, α	Undrained Shear Strength, Su (psf)	Steel Casing Reduction Factor[1]
1 - Recent Alluvium (Qoa) (Sand)	0	12	2	-10	-	-	FHWA Sand	120	28	10	1.00	0.69	-	-	0
2 - Recent Alluvium (Qoa) (Clay)	12	19	-10	-17	0	2	FHWA Clay	110	-	-	-	-	0.55	400	0
3 - Recent Alluvium (Qoa) (Sand)	19	35	-17	-33	2	18	FHWA Sand	120	28	10	0.61	0.47	-	-	0
4 - Young Alluvium (Qya) (Sand)	35	65	-33	-63	18	48	FHWA Sand	125	32	30	0.70	0.41	-	-	0
5 - Young Estuarine (Qyes) (Clay)	65	82	-63	-80	48	65	FHWA Clay	115	-	-	-	-	0.55	750	0
6 - Old Alluvium (Qoa) (Sand)	82	122	-80	-120	65	105	FHWA Sand	125	34	25	0.28	0.25	-	-	1
7 - Old Alluvium (Qoa) (Sand w	122	207	-120	-205	105	190	FHWA Sand	130	36	35	0.25	0.25	-	-	1
8 - Del Mar Formation	207	252	-205	-250	190	235	FHWA Clay	135	-	-	-	-	0.51	4000	1

[1]Assumes casing extends to top of Old alluvial deposits for constructability. Geotechnical capacities are negelected for permanent steel smooth-wall casing per Caltrans Guildelines.

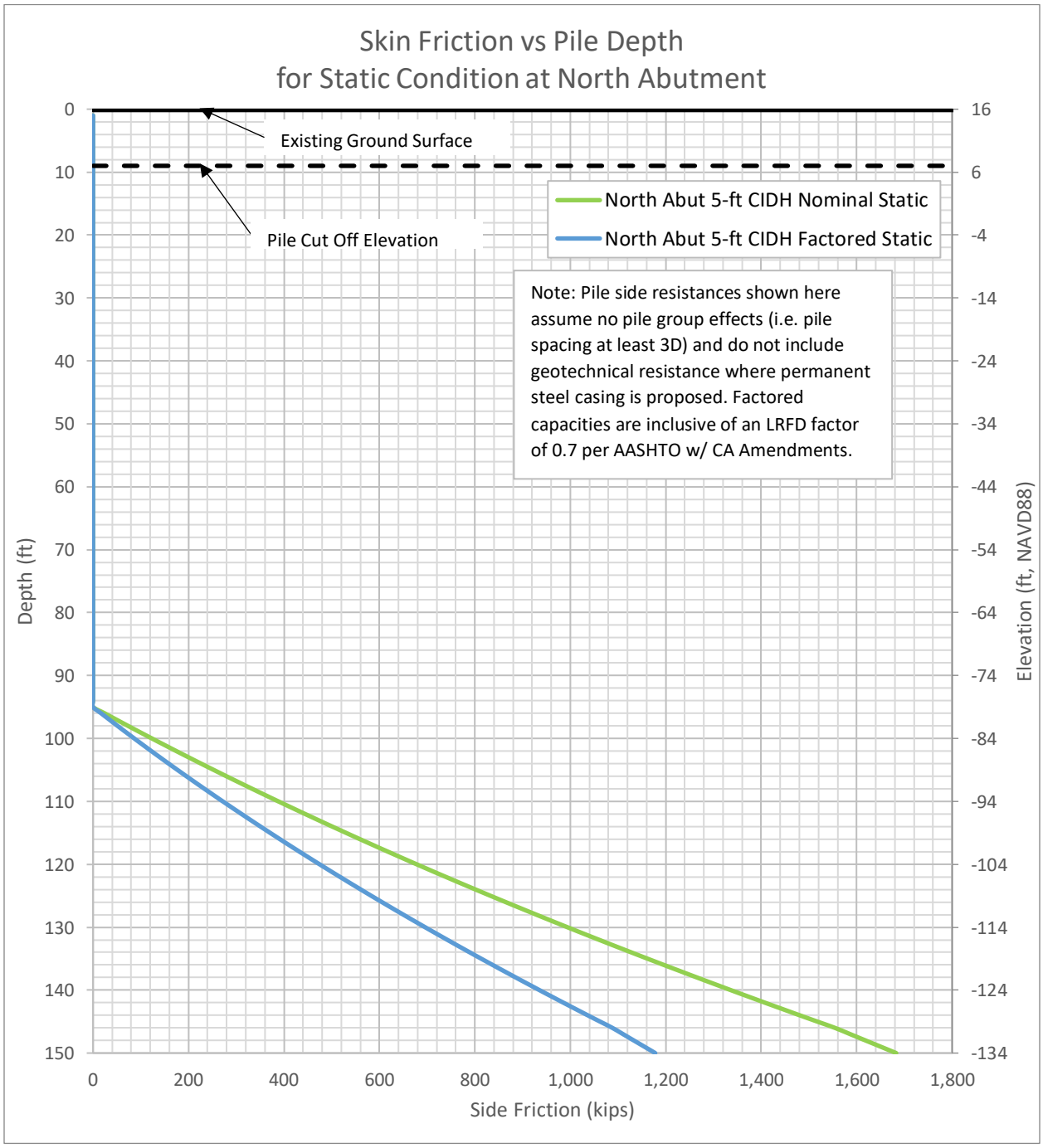
SOUTH ABUTMENT SUBSURFACE PARAMETERS USED IN AXIAL CAPACITY ANALYSES

Layer	Top Depth (ft)	Bottom Depth (ft)	Top Elev (ft)	Bottom Elev (ft)	Soil Model	Total Unit Weight	Friction Angle*	Avg N Value	Top Beta, β	Bottom Beta, β	Adhesion factor, α	Undrained Shear Strength, Su (psf)	Steel Casing Reduction Factor[1]
1 - Artificial Fill	0	9	16	7	FHWA Sand	120	34	15	1.20	1.10	-	-	0
2 - Recent Alluvium (Qoa) (Sand)	9	30	7	-14	FHWA Sand	120	28	10	0.73	0.51	-	-	0
3 - Young Alluvium (Qya) (Sand)	30	78	-14	-62	FHWA Sand	125	32	30	0.76	0.31	-	-	0
4 - Young Estuarine (Qyes) (Clay)	78	94	-62	-78	FHWA Clay	115	-	-	-	-	0.55	750	0
5 - Old Alluvium (Qoa) (Sand)	94	152	-78	-136	FHWA Sand	125	34	25	0.25	0.25	-	-	1
6 - Old Alluvium (Qoa) (Sand w	152	201	-136	-185	FHWA Sand	130	36	35	0.25	0.25	-	-	1
7 - Old Alluvial Deposits (Qoa) (Gravelly Sand)	201	231	-185	-215	FHWA Sand	130	36	50	0.25	0.25	-	-	1
8 - Del Mar Formation	231	266	-215	-250	FHWA Clay	135	-	-	-	-	0.51	4000	1

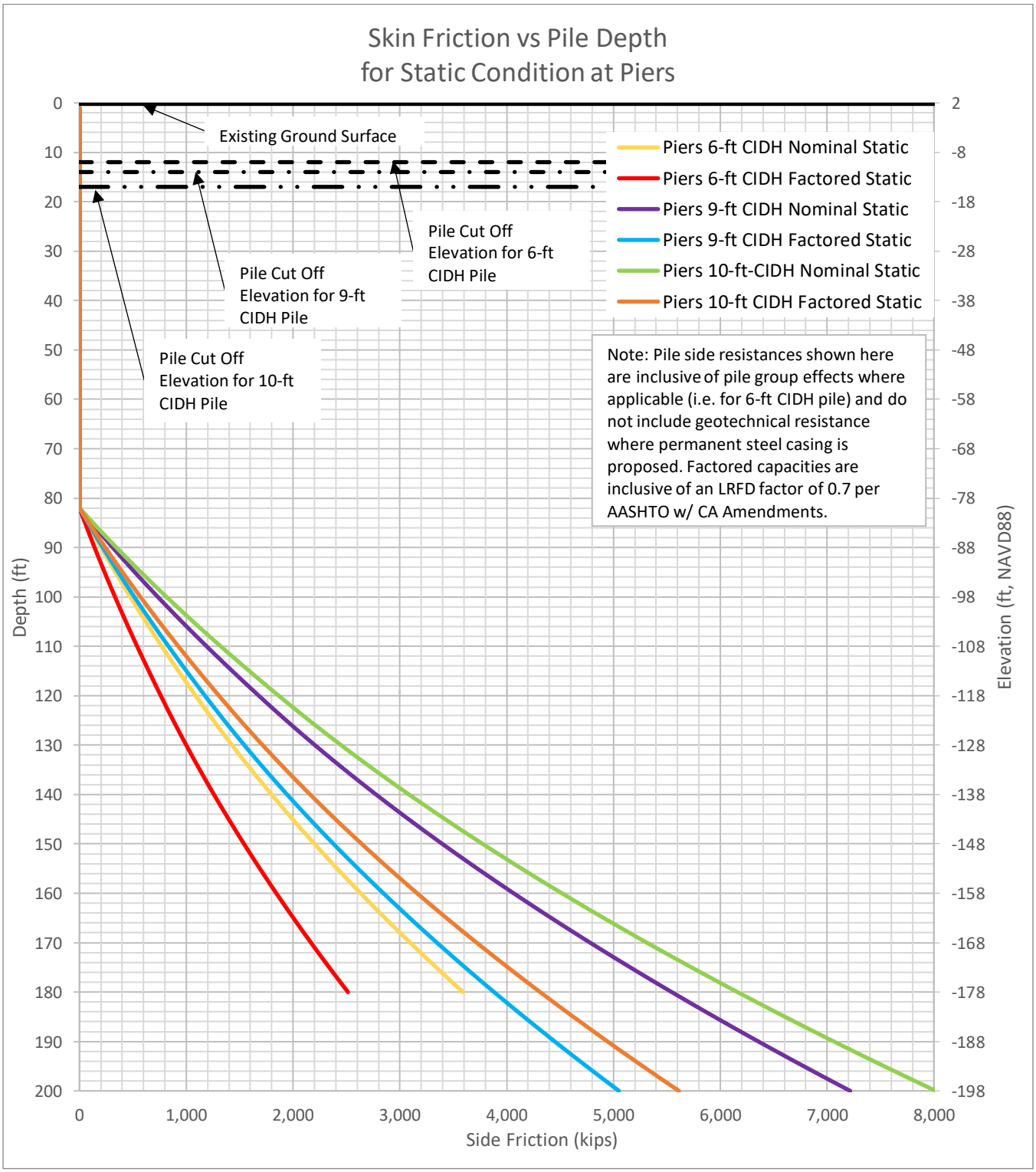
[1]Assumes casing extends to top of Old alluvial deposits for constructability. Geotechnical capacities are negelected for permanent steel smooth-wall casing per Caltrans Guildelines.

Axial Pile Capacity Charts

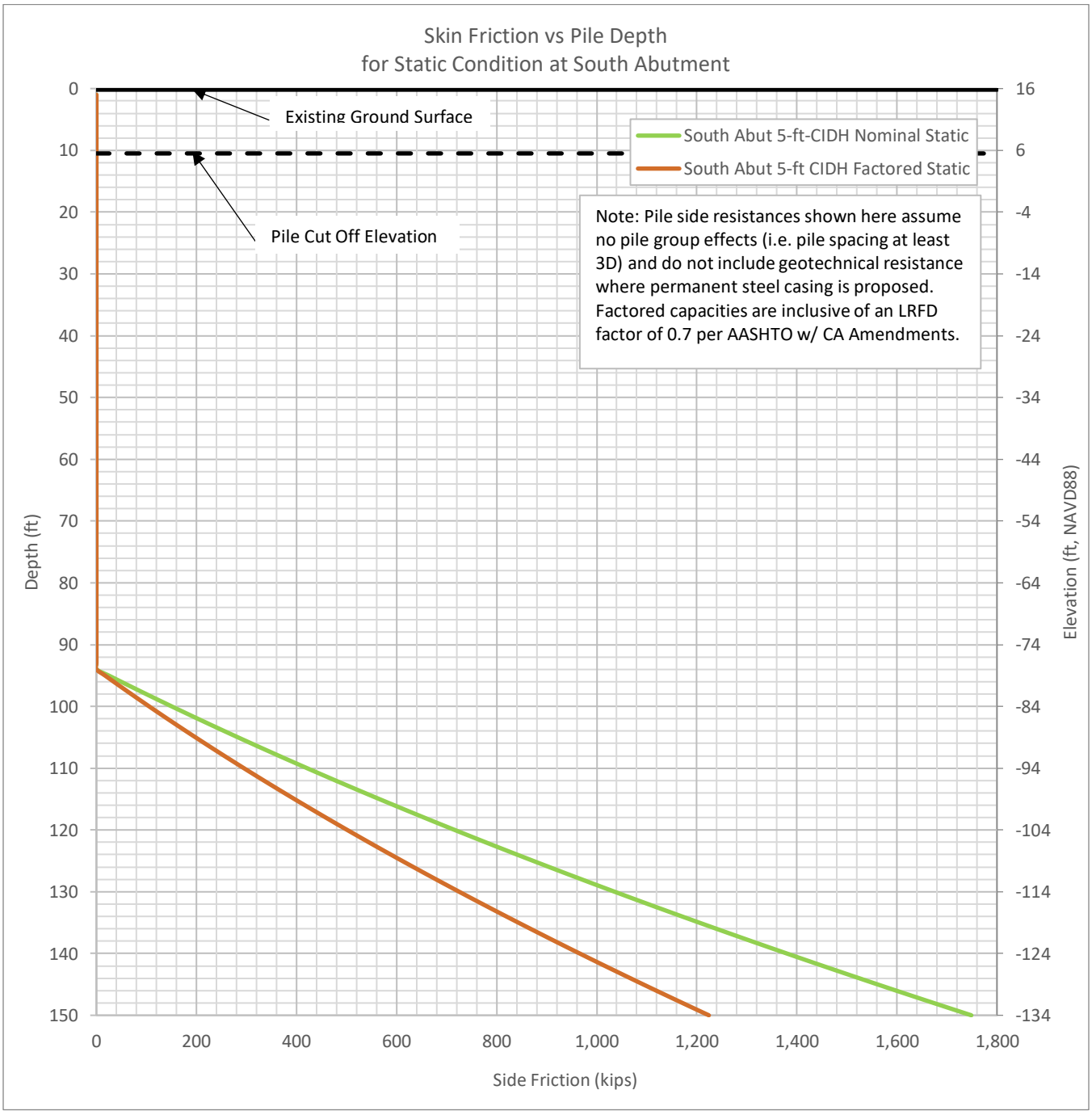
North Abutment Results



Pier Axial Capacity Results



South Abutment Results



North Abutment
Static Axial Capacity
5-ft CIDH with 6-ft Casing

SHAFT for Windows, Version 2017.8.4

Serial Number : 253582343

VERTICALLY LOADED DRILLED SHAFT ANALYSIS
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Path to file locations : C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Pile Capacity\SHAFT Final Rev2\
Name of input data file : NorthAbut_Final_Rev.sf8d
Name of output file : NorthAbut_Final_Rev.sf8o
Name of plot output file : NorthAbut_Final_Rev.sf8p
Name of runtime file : NorthAbut_Final_Rev.sf8r

Time and Date of Analysis

Date: May 18, 2020 Time: 09:08:59

Camino Del Mar Bridge Replacement - Phase 0

PROPOSED DEPTH = 150.0 FT

NUMBER OF LAYERS = 9

WATER TABLE DEPTH = 10.0 FT.

SOIL INFORMATION

LAYER NO 1----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.120E+01
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.000E+00

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.110E+01
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.900E+01

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 2----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.730E+00
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.900E+01

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.524E+00
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.280E+02

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.700E+00

LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 3----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.110E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.280E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.110E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.390E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 4----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD

SKIN FRICTION COEFFICIENT- BETA	= 0.438E+00
INTERNAL FRICTION ANGLE, DEG.	= 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11
DEPTH, FT	= 0.390E+02

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD

SKIN FRICTION COEFFICIENT- BETA	= 0.376E+00
INTERNAL FRICTION ANGLE, DEG.	= 0.280E+02

```
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.120E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.480E+02

  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 5----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.565E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.320E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.480E+02

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.255E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.320E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.850E+02

  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 6----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.750E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.115E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.850E+02
```

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.750E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.115E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.950E+02	
LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.700E+00	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.500E+00	

LAYER NO 7----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD

SKIN FRICTION COEFFICIENT- BETA	= 0.250E+00	
INTERNAL FRICTION ANGLE, DEG.	= 0.340E+02	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.950E+02	

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD

SKIN FRICTION COEFFICIENT- BETA	= 0.250E+00	
INTERNAL FRICTION ANGLE, DEG.	= 0.340E+02	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.116E+03	
LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.700E+00	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.500E+00	

LAYER NO 8----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD

SKIN FRICTION COEFFICIENT- BETA	= 0.250E+00	
INTERNAL FRICTION ANGLE, DEG.	= 0.360E+02	

```
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.116E+03

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.146E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 9----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.510E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.400E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.135E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.146E+03


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.510E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.400E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.135E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.266E+03


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00
```

(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS

INPUT DRILLED SHAFT INFORMATION

MINIMUM SHAFT DIAMETER	=	5.000	FT.
MAXIMUM SHAFT DIAMETER	=	5.000	FT.
RATIO BASE/SHAFT DIAMETER	=	0.000	FT.
ANGLE OF BELL	=	0.000	DEG.
IGNORED TOP PORTION	=	95.000	FT.
IGNORED BOTTOM PORTION	=	0.000	FT.
ELASTIC MODULUS, Ec	=	0.360E+07	LB/SQ IN

COMPUTATION RESULTS

- CASE ANALYZED : 1
  VARIATION LENGTH : 1
  VARIATION DIAMETER : 1

DRILLED SHAFT INFORMATION

DIAMETER OF STEM	=	5.000	FT.
DIAMETER OF BASE	=	5.000	FT.
END OF STEM TO BASE	=	0.000	FT.
ANGLE OF BELL	=	0.000	DEG.
IGNORED TOP PORTION	=	95.000	FT.
IGNORED BOTTOM PORTION	=	0.000	FT.
AREA OF ONE PERCENT STEEL	=	28.278	SQ.IN.
ELASTIC MODULUS, Ec	=	0.360E+07	LB/SQ IN
VOLUME OF UNDERREAM	=	0.000	CU.YDS.
SHAFT LENGTH	=	150.000	FT.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
96.0	69.82	12.08	174.58	186.66	8.46	87.29	95.75
97.0	70.55	24.29	174.58	198.86	17.00	87.29	104.29
98.0	71.28	36.61	174.58	211.19	25.63	87.29	112.92
99.0	72.00	49.06	174.58	223.64	34.34	87.29	121.63
100.0	72.73	61.64	174.58	236.21	43.15	87.29	130.43
101.0	73.46	74.33	174.58	248.91	52.03	87.29	139.32
102.0	74.19	87.15	174.58	261.73	61.01	87.29	148.30
103.0	74.91	100.09	174.58	274.67	70.07	87.29	157.36
104.0	75.64	113.16	174.58	287.74	79.21	87.29	166.50
105.0	76.37	126.35	174.58	300.93	88.44	87.29	175.73
106.0	77.10	139.66	174.58	314.24	97.76	87.29	185.05
107.0	77.82	153.09	184.68	337.78	107.16	92.34	199.51
108.0	78.55	166.65	195.71	362.36	116.65	97.86	214.51
109.0	79.28	180.33	207.66	387.98	126.23	103.83	230.06
110.0	80.00	194.13	220.52	414.65	135.89	110.26	246.15
111.0	80.73	208.06	234.30	442.36	145.64	117.15	262.79
112.0	81.46	222.11	245.33	467.43	155.47	122.66	278.14
113.0	82.19	236.28	253.60	489.87	165.39	126.80	292.19
114.0	82.91	250.57	259.11	509.68	175.40	129.55	304.95
115.0	83.64	264.99	261.87	526.85	185.49	130.93	316.43
116.0	84.37	279.53	261.87	541.40	195.67	130.93	326.60
117.0	85.10	294.20	261.87	556.06	205.94	130.93	336.87
118.0	85.82	309.00	261.87	570.86	216.30	130.93	347.23
119.0	86.55	323.93	261.87	585.80	226.75	130.93	357.68
120.0	87.28	339.00	261.87	600.86	237.30	130.93	368.23
121.0	88.01	354.20	261.87	616.06	247.94	130.93	378.87
122.0	88.73	369.53	261.87	631.39	258.67	130.93	389.60
123.0	89.46	384.99	261.87	646.86	269.50	130.93	400.43
124.0	90.19	400.59	261.87	662.46	280.41	130.93	411.35
125.0	90.91	416.32	261.87	678.19	291.42	130.93	422.36
126.0	91.64	432.18	261.87	694.05	302.53	130.93	433.46
127.0	92.37	448.18	261.87	710.04	313.73	130.93	444.66
128.0	93.10	464.31	261.87	726.17	325.01	130.93	455.95
129.0	93.82	480.57	261.87	742.43	336.40	130.93	467.33

130.0	94.55	496.96	261.87	758.83	347.87	130.93	478.81
131.0	95.28	513.49	261.87	775.35	359.44	130.93	490.37
132.0	96.01	530.15	261.87	792.01	371.10	130.93	502.04
133.0	96.73	546.94	261.87	808.81	382.86	130.93	513.79
134.0	97.46	563.86	261.87	825.73	394.71	130.93	525.64
135.0	98.19	580.92	261.87	842.79	406.65	130.93	537.58
136.0	98.91	598.11	261.87	859.98	418.68	130.93	549.61
137.0	99.64	615.44	272.47	887.91	430.80	136.24	567.04
138.0	100.37	632.89	284.05	916.94	443.02	142.02	585.05
139.0	101.10	650.48	296.58	947.06	455.34	148.29	603.63
140.0	101.82	668.20	310.08	978.28	467.74	155.04	622.78
141.0	102.55	686.06	324.55	1010.60	480.24	162.27	642.51
142.0	103.28	704.04	336.12	1040.16	492.83	168.06	660.89
143.0	104.01	722.16	344.80	1066.96	505.51	172.40	677.91
144.0	104.73	740.41	350.58	1091.00	518.29	175.29	693.58
145.0	105.46	758.80	353.48	1112.27	531.16	176.74	707.90
146.0	106.19	777.32	353.48	1130.79	544.12	176.74	720.86
147.0	106.92	793.34	353.48	1146.82	555.34	176.74	732.08
148.0	107.64	809.36	353.48	1162.84	566.56	176.74	743.29
149.0	108.37	825.39	353.48	1178.86	577.77	176.74	754.51
150.0	109.10	841.41	353.48	1194.89	588.99	176.74	765.73

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.5856E-01	0.2734E-04	0.4654E-02	0.1000E-04
0.2928E+00	0.1367E-03	0.2327E-01	0.5000E-04
0.5856E+00	0.2734E-03	0.4654E-01	0.1000E-03
0.2952E+02	0.1373E-01	0.2327E+01	0.5000E-02
0.4428E+02	0.2060E-01	0.3491E+01	0.7500E-02
0.5904E+02	0.2747E-01	0.4654E+01	0.1000E-01
0.1476E+03	0.6867E-01	0.1164E+02	0.2500E-01
0.2934E+03	0.1369E+00	0.2327E+02	0.5000E-01
0.4065E+03	0.1957E+00	0.3491E+02	0.7500E-01
0.5086E+03	0.2512E+00	0.4654E+02	0.1000E+00
0.8122E+03	0.4949E+00	0.1164E+03	0.2500E+00
0.9751E+03	0.7967E+00	0.1785E+03	0.5000E+00
0.9990E+03	0.9048E+00	0.1979E+03	0.6000E+00
0.1102E+04	0.1841E+01	0.3058E+03	0.1500E+01
0.1137E+04	0.3354E+01	0.3429E+03	0.3000E+01

RESULT FROM UPPER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.8303E-01	0.3453E-04	0.6952E-02	0.1000E-04
0.4152E+00	0.1727E-03	0.3476E-01	0.5000E-04
0.8303E+00	0.3453E-03	0.6952E-01	0.1000E-03
0.4198E+02	0.1739E-01	0.3476E+01	0.5000E-02
0.6297E+02	0.2609E-01	0.5214E+01	0.7500E-02
0.8396E+02	0.3479E-01	0.6952E+01	0.1000E-01
0.2099E+03	0.8696E-01	0.1738E+02	0.2500E-01
0.4130E+03	0.1723E+00	0.3476E+02	0.5000E-01
0.5625E+03	0.2420E+00	0.5214E+02	0.7500E-01
0.6880E+03	0.3048E+00	0.6952E+02	0.1000E+00
0.9816E+03	0.5480E+00	0.1738E+03	0.2500E+00
0.1083E+04	0.8324E+00	0.2463E+03	0.5000E+00
0.1101E+04	0.9390E+00	0.2651E+03	0.6000E+00
0.1172E+04	0.1864E+01	0.3393E+03	0.1500E+01
0.1184E+04	0.3368E+01	0.3517E+03	0.3000E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.3588E-01	0.2062E-04	0.2357E-02	0.1000E-04
0.1794E+00	0.1031E-03	0.1178E-01	0.5000E-04
0.3588E+00	0.2062E-03	0.2356E-01	0.1000E-03
0.1803E+02	0.1033E-01	0.1178E+01	0.5000E-02
0.2705E+02	0.1550E-01	0.1767E+01	0.7500E-02
0.3607E+02	0.2067E-01	0.2357E+01	0.1000E-01
0.9017E+02	0.5167E-01	0.5891E+01	0.2500E-01
0.1803E+03	0.1033E+00	0.1178E+02	0.5000E-01
0.2579E+03	0.1514E+00	0.1767E+02	0.7500E-01
0.3317E+03	0.1984E+00	0.2357E+02	0.1000E+00
0.6349E+03	0.4394E+00	0.5891E+02	0.2500E+00
0.8668E+03	0.7608E+00	0.1108E+03	0.5000E+00
0.8961E+03	0.8705E+00	0.1308E+03	0.6000E+00
0.1032E+04	0.1819E+01	0.2722E+03	0.1500E+01
0.1087E+04	0.3338E+01	0.3323E+03	0.3000E+01

North Abutment
Seismic Axial Capacity
5-ft CIDH with 6-ft Casing

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SHAFT for Windows, Version 2017.8.4

Serial Number : 253582343

VERTICALLY LOADED DRILLED SHAFT ANALYSIS
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Path to file locations : C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Pile Capacity\SHAFT Final Rev2\
Name of input data file : NorthAbut_Seismic_Final_Rev.sf8d
Name of output file : NorthAbut_Seismic_Final_Rev.sf8o
Name of plot output file : NorthAbut_Seismic_Final_Rev.sf8p
Name of runtime file : NorthAbut_Seismic_Final_Rev.sf8r

Time and Date of Analysis

Date: May 18, 2020 Time: 11:16:38

Camino Del Mar Bridge Replacement - Phase 0

PROPOSED DEPTH = 150.0 FT

NUMBER OF LAYERS = 9

WATER TABLE DEPTH = 10.0 FT.

SOIL INFORMATION

LAYER NO 1----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.120E+01
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.000E+00

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.110E+01
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.900E+01

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.100E+01
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.100E+01

LAYER NO 2----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA = 0.550E+00 (*)
END BEARING COEFFICIENT-Nc = 0.816E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.900E+01

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA = 0.550E+00 (*)
END BEARING COEFFICIENT-Nc = 0.900E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.280E+02

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 3----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.110E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.280E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.110E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.390E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 4----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.450E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.390E+02	

AT THE BOTTOM

```
  STRENGTH REDUCTION FACTOR-ALPHA                    = 0.550E+00  (*)
  END BEARING COEFFICIENT-Nc                         = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                 = 0.450E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.120E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.480E+02


  LRFD RESISTANCE FACTOR (SIDE FRICTION)             = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)            = 0.100E+01


LAYER NO 5----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                    = 0.550E+00  (*)
  END BEARING COEFFICIENT-Nc                         = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                 = 0.700E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.480E+02


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                    = 0.550E+00  (*)
  END BEARING COEFFICIENT-Nc                         = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                 = 0.700E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.850E+02


  LRFD RESISTANCE FACTOR (SIDE FRICTION)             = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)            = 0.100E+01


LAYER NO 6----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                    = 0.550E+00
  END BEARING COEFFICIENT-Nc                         = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                 = 0.750E+03
```

```
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.115E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.850E+02


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.750E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.115E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.950E+02


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E+01


LAYER NO 7----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.950E+02

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.116E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E+01


LAYER NO 8----SAND
```

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.360E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.130E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.116E+03

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.360E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.130E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.146E+03

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.100E+01
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.100E+01

LAYER NO 9----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA = 0.510E+00
END BEARING COEFFICIENT-Nc = 0.900E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+04
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.135E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.146E+03

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA = 0.510E+00
END BEARING COEFFICIENT-Nc = 0.900E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+04
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.135E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.266E+03

```
  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E+01


(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS


INPUT DRILLED SHAFT INFORMATION
-------------------------------

 MINIMUM SHAFT DIAMETER    =    5.000  FT.
 MAXIMUM SHAFT DIAMETER    =    5.000  FT.
 RATIO BASE/SHAFT DIAMETER =    0.000  FT.
 ANGLE OF BELL             =    0.000  DEG.
 IGNORED TOP PORTION       =   95.000  FT.
 IGNORED BOTTOM PORTION    =    0.000  FT.
 ELASTIC MODULUS, Ec       = 0.360E+07 LB/SQ IN




COMPUTATION RESULTS
-------------------


- CASE ANALYZED      :     1
  VARIATION LENGTH   :     1
  VARIATION DIAMETER :     1


DRILLED SHAFT INFORMATION

-------------------------

 DIAMETER OF STEM          =    5.000  FT.
 DIAMETER OF BASE          =    5.000  FT.
 END OF STEM TO BASE       =    0.000  FT.
 ANGLE OF BELL             =    0.000  DEG.
 IGNORED TOP PORTION       =   95.000  FT.
 IGNORED BOTTOM PORTION    =    0.000  FT.
 AREA OF ONE PERCENT STEEL =   28.278  SQ.IN.
```

ELASTIC MODULUS, Ec = 0.360E+07 LB/SQ IN
VOLUME OF UNDERREAM = 0.000 CU.YDS.
SHAFT LENGTH = 150.000 FT.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
96.0	69.82	12.08	174.58	186.66	12.08	174.58	186.66
97.0	70.55	24.29	174.58	198.86	24.29	174.58	198.86
98.0	71.28	36.61	174.58	211.19	36.61	174.58	211.19
99.0	72.00	49.06	174.58	223.64	49.06	174.58	223.64
100.0	72.73	61.64	174.58	236.21	61.64	174.58	236.21
101.0	73.46	74.33	174.58	248.91	74.33	174.58	248.91
102.0	74.19	87.15	174.58	261.73	87.15	174.58	261.73
103.0	74.91	100.09	174.58	274.67	100.09	174.58	274.67
104.0	75.64	113.16	174.58	287.74	113.16	174.58	287.74
105.0	76.37	126.35	174.58	300.93	126.35	174.58	300.93
106.0	77.10	139.66	174.58	314.24	139.66	174.58	314.24
107.0	77.82	153.09	184.68	337.78	153.09	184.68	337.78
108.0	78.55	166.65	195.71	362.36	166.65	195.71	362.36
109.0	79.28	180.33	207.66	387.98	180.33	207.66	387.98
110.0	80.00	194.13	220.52	414.65	194.13	220.52	414.65
111.0	80.73	208.06	234.30	442.36	208.06	234.30	442.36
112.0	81.46	222.11	245.33	467.43	222.11	245.33	467.43
113.0	82.19	236.28	253.60	489.87	236.28	253.60	489.87
114.0	82.91	250.57	259.11	509.68	250.57	259.11	509.68
115.0	83.64	264.99	261.87	526.85	264.99	261.87	526.85
116.0	84.37	279.53	261.87	541.40	279.53	261.87	541.40
117.0	85.10	294.20	261.87	556.06	294.20	261.87	556.06
118.0	85.82	309.00	261.87	570.86	309.00	261.87	570.86
119.0	86.55	323.93	261.87	585.80	323.93	261.87	585.80
120.0	87.28	339.00	261.87	600.86	339.00	261.87	600.86
121.0	88.01	354.20	261.87	616.06	354.20	261.87	616.06
122.0	88.73	369.53	261.87	631.39	369.53	261.87	631.39
123.0	89.46	384.99	261.87	646.86	384.99	261.87	646.86

124.0	90.19	400.59	261.87	662.46	400.59	261.87	662.46
125.0	90.91	416.32	261.87	678.19	416.32	261.87	678.19
126.0	91.64	432.18	261.87	694.05	432.18	261.87	694.05
127.0	92.37	448.18	261.87	710.04	448.18	261.87	710.04
128.0	93.10	464.31	261.87	726.17	464.31	261.87	726.17
129.0	93.82	480.57	261.87	742.43	480.57	261.87	742.43
130.0	94.55	496.96	261.87	758.83	496.96	261.87	758.83
131.0	95.28	513.49	261.87	775.35	513.49	261.87	775.35
132.0	96.01	530.15	261.87	792.01	530.15	261.87	792.01
133.0	96.73	546.94	261.87	808.81	546.94	261.87	808.81
134.0	97.46	563.86	261.87	825.73	563.86	261.87	825.73
135.0	98.19	580.92	261.87	842.79	580.92	261.87	842.79
136.0	98.91	598.11	261.87	859.98	598.11	261.87	859.98
137.0	99.64	615.44	272.47	887.91	615.44	272.47	887.91
138.0	100.37	632.89	284.05	916.94	632.89	284.05	916.94
139.0	101.10	650.48	296.58	947.06	650.48	296.58	947.06
140.0	101.82	668.20	310.08	978.28	668.20	310.08	978.28
141.0	102.55	686.06	324.55	1010.60	686.06	324.55	1010.60
142.0	103.28	704.04	336.12	1040.16	704.04	336.12	1040.16
143.0	104.01	722.16	344.80	1066.96	722.16	344.80	1066.96
144.0	104.73	740.41	350.58	1091.00	740.41	350.58	1091.00
145.0	105.46	758.80	353.48	1112.27	758.80	353.48	1112.27
146.0	106.19	777.32	353.48	1130.79	777.32	353.48	1130.79
147.0	106.92	793.34	353.48	1146.82	793.34	353.48	1146.82
148.0	107.64	809.36	353.48	1162.84	809.36	353.48	1162.84
149.0	108.37	825.39	353.48	1178.86	825.39	353.48	1178.86
150.0	109.10	841.41	353.48	1194.89	841.41	353.48	1194.89

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.5856E-01	0.2734E-04	0.4654E-02	0.1000E-04
0.2928E+00	0.1367E-03	0.2327E-01	0.5000E-04
0.5856E+00	0.2734E-03	0.4654E-01	0.1000E-03
0.2952E+02	0.1373E-01	0.2327E+01	0.5000E-02
0.4428E+02	0.2060E-01	0.3491E+01	0.7500E-02
0.5904E+02	0.2747E-01	0.4654E+01	0.1000E-01
0.1476E+03	0.6867E-01	0.1164E+02	0.2500E-01
0.2934E+03	0.1369E+00	0.2327E+02	0.5000E-01
0.4065E+03	0.1957E+00	0.3491E+02	0.7500E-01

0.5086E+03	0.2512E+00	0.4654E+02	0.1000E+00
0.8122E+03	0.4949E+00	0.1164E+03	0.2500E+00
0.9751E+03	0.7967E+00	0.1785E+03	0.5000E+00
0.9990E+03	0.9048E+00	0.1979E+03	0.6000E+00
0.1102E+04	0.1841E+01	0.3058E+03	0.1500E+01
0.1137E+04	0.3354E+01	0.3429E+03	0.3000E+01

RESULT FROM UPPER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.8303E-01	0.3453E-04	0.6952E-02	0.1000E-04
0.4152E+00	0.1727E-03	0.3476E-01	0.5000E-04
0.8303E+00	0.3453E-03	0.6952E-01	0.1000E-03
0.4198E+02	0.1739E-01	0.3476E+01	0.5000E-02
0.6297E+02	0.2609E-01	0.5214E+01	0.7500E-02
0.8396E+02	0.3479E-01	0.6952E+01	0.1000E-01
0.2099E+03	0.8696E-01	0.1738E+02	0.2500E-01
0.4130E+03	0.1723E+00	0.3476E+02	0.5000E-01
0.5625E+03	0.2420E+00	0.5214E+02	0.7500E-01
0.6880E+03	0.3048E+00	0.6952E+02	0.1000E+00
0.9816E+03	0.5480E+00	0.1738E+03	0.2500E+00
0.1083E+04	0.8324E+00	0.2463E+03	0.5000E+00
0.1101E+04	0.9390E+00	0.2651E+03	0.6000E+00
0.1172E+04	0.1864E+01	0.3393E+03	0.1500E+01
0.1184E+04	0.3368E+01	0.3517E+03	0.3000E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.3588E-01	0.2062E-04	0.2357E-02	0.1000E-04
0.1794E+00	0.1031E-03	0.1178E-01	0.5000E-04
0.3588E+00	0.2062E-03	0.2356E-01	0.1000E-03
0.1803E+02	0.1033E-01	0.1178E+01	0.5000E-02
0.2705E+02	0.1550E-01	0.1767E+01	0.7500E-02
0.3607E+02	0.2067E-01	0.2357E+01	0.1000E-01
0.9017E+02	0.5167E-01	0.5891E+01	0.2500E-01
0.1803E+03	0.1033E+00	0.1178E+02	0.5000E-01
0.2579E+03	0.1514E+00	0.1767E+02	0.7500E-01
0.3317E+03	0.1984E+00	0.2357E+02	0.1000E+00
0.6349E+03	0.4394E+00	0.5891E+02	0.2500E+00
0.8668E+03	0.7608E+00	0.1108E+03	0.5000E+00
0.8961E+03	0.8705E+00	0.1308E+03	0.6000E+00
0.1032E+04	0.1819E+01	0.2722E+03	0.1500E+01
0.1087E+04	0.3338E+01	0.3323E+03	0.3000E+01

South Abutment
Static Axial Capacity
5-ft CIDH with 6-ft Casing

SHAFT for Windows, Version 2017.8.4

Serial Number : 253582343

VERTICALLY LOADED DRILLED SHAFT ANALYSIS
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Path to file locations : C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Pile Capacity\SHAFT Final Rev2\
Name of input data file : SouthAbut_Final_Rev.sf8d
Name of output file : SouthAbut_Final_Rev.sf8o
Name of plot output file : SouthAbut_Final_Rev.sf8p
Name of runtime file : SouthAbut_Final_Rev.sf8r

Time and Date of Analysis

Date: May 18, 2020 Time: 09:27:10

Camino Del Mar Bridge Replacement - Phase 0

PROPOSED DEPTH = 150.0 FT

NUMBER OF LAYERS = 8

WATER TABLE DEPTH = 10.0 FT.

SOIL INFORMATION

LAYER NO 1----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.120E+01
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.000E+00

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.110E+01
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.900E+01

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 2----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.730E+00
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.900E+01

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.510E+00
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.300E+02

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.700E+00

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  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 3----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.760E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.320E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.300E+02

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.310E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.320E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.780E+02

  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 4----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.750E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.115E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.780E+02


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.750E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
```

```
  SOIL UNIT WEIGHT, LB/CU FT                          = 0.115E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT            = 0.100E+11
  DEPTH, FT                                           = 0.940E+02


  LRFD RESISTANCE FACTOR (SIDE FRICTION)              = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)             = 0.500E+00


LAYER NO 5----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                     = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                       = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST       = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                          = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT            = 0.100E+11
  DEPTH, FT                                           = 0.940E+02

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                     = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                       = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST       = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                          = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT            = 0.100E+11
  DEPTH, FT                                           = 0.152E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)              = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)             = 0.500E+00


LAYER NO 6----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                     = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                       = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST       = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                          = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT            = 0.100E+11
  DEPTH, FT                                           = 0.152E+03

  AT THE BOTTOM
```

```
  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                  = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                    = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST    = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                       = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT         = 0.100E+11
  DEPTH, FT                                        = 0.201E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)           = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)          = 0.500E+00


LAYER NO 7----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                  = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                    = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST    = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                       = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT         = 0.100E+11
  DEPTH, FT                                        = 0.201E+03

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                  = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                    = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST    = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                       = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT         = 0.100E+11
  DEPTH, FT                                        = 0.231E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)           = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)          = 0.500E+00


LAYER NO 8----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                  = 0.510E+00
  END BEARING COEFFICIENT-Nc                       = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT               = 0.400E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST    = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                       = 0.135E+03
```

```
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.231E+03


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.510E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.400E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.135E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.266E+03


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00



(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS



INPUT DRILLED SHAFT INFORMATION
-------------------------------

 MINIMUM SHAFT DIAMETER    =    5.000  FT.
 MAXIMUM SHAFT DIAMETER    =    5.000  FT.
 RATIO BASE/SHAFT DIAMETER =    0.000  FT.
 ANGLE OF BELL             =    0.000  DEG.
 IGNORED TOP PORTION       =   94.000  FT.
 IGNORED BOTTOM PORTION    =    0.000  FT.
 ELASTIC MODULUS, Ec       = 0.360E+07 LB/SQ IN




COMPUTATION RESULTS
-------------------



- CASE ANALYZED      :     1
  VARIATION LENGTH   :     1
  VARIATION DIAMETER :     1
```

DRILLED SHAFT INFORMATION

DIAMETER OF STEM	= 5.000	FT.
DIAMETER OF BASE	= 5.000	FT.
END OF STEM TO BASE	= 0.000	FT.
ANGLE OF BELL	= 0.000	DEG.
IGNORED TOP PORTION	= 94.000	FT.
IGNORED BOTTOM PORTION	= 0.000	FT.
AREA OF ONE PERCENT STEEL	= 28.278	SQ.IN.
ELASTIC MODULUS, Ec	= 0.360E+07	LB/SQ IN
VOLUME OF UNDERREAM	= 0.000	CU.YDS.
SHAFT LENGTH	= 150.000	FT.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
95.0	69.09	12.23	174.58	186.81	8.56	87.29	95.85
96.0	69.82	24.59	174.58	199.17	17.21	87.29	104.50
97.0	70.55	37.07	174.58	211.65	25.95	87.29	113.24
98.0	71.28	49.67	174.58	224.25	34.77	87.29	122.06
99.0	72.00	62.40	174.58	236.97	43.68	87.29	130.97
100.0	72.73	75.25	174.58	249.82	52.67	87.29	139.96
101.0	73.46	88.22	174.58	262.79	61.75	87.29	149.04
102.0	74.19	101.31	174.58	275.89	70.92	87.29	158.21
103.0	74.91	114.53	174.58	289.11	80.17	87.29	167.46
104.0	75.64	127.87	174.58	302.45	89.51	87.29	176.80
105.0	76.37	141.33	174.58	315.91	98.93	87.29	186.22
106.0	77.10	154.92	174.58	329.49	108.44	87.29	195.73
107.0	77.82	168.63	174.58	343.20	118.04	87.29	205.33
108.0	78.55	182.46	174.58	357.03	127.72	87.29	215.01

109.0	79.28	196.41	174.58	370.99	137.49	87.29	224.78
110.0	80.00	210.49	174.58	385.07	147.34	87.29	234.63
111.0	80.73	224.69	174.58	399.27	157.28	87.29	244.57
112.0	81.46	239.01	174.58	413.59	167.31	87.29	254.60
113.0	82.19	253.46	174.58	428.04	177.42	87.29	264.71
114.0	82.91	268.03	174.58	442.61	187.62	87.29	274.91
115.0	83.64	282.72	174.58	457.30	197.90	87.29	285.19
116.0	84.37	297.54	174.58	472.11	208.28	87.29	295.56
117.0	85.10	312.47	174.58	487.05	218.73	87.29	306.02
118.0	85.82	327.54	174.58	502.11	229.27	87.29	316.56
119.0	86.55	342.72	174.58	517.30	239.90	87.29	327.19
120.0	87.28	358.03	174.58	532.60	250.62	87.29	337.91
121.0	88.01	373.46	174.58	548.03	261.42	87.29	348.71
122.0	88.73	389.01	174.58	563.59	272.31	87.29	359.59
123.0	89.46	404.68	174.58	579.26	283.28	87.29	370.57
124.0	90.19	420.48	174.58	595.06	294.34	87.29	381.63
125.0	90.91	436.40	174.58	610.98	305.48	87.29	392.77
126.0	91.64	452.45	174.58	627.03	316.71	87.29	404.00
127.0	92.37	468.62	174.58	643.19	328.03	87.29	415.32
128.0	93.10	484.91	174.58	659.48	339.43	87.29	426.72
129.0	93.82	501.32	174.58	675.90	350.92	87.29	438.21
130.0	94.55	517.86	174.58	692.43	362.50	87.29	449.79
131.0	95.28	534.51	174.58	709.09	374.16	87.29	461.45
132.0	96.01	551.30	174.58	725.87	385.91	87.29	473.20
133.0	96.73	568.20	174.58	742.78	397.74	87.29	485.03
134.0	97.46	585.23	174.58	759.81	409.66	87.29	496.95
135.0	98.19	602.38	174.58	776.96	421.67	87.29	508.95
136.0	98.91	619.65	174.58	794.23	433.76	87.29	521.05
137.0	99.64	637.05	174.58	811.63	445.94	87.29	533.22
138.0	100.37	654.57	174.58	829.15	458.20	87.29	545.49
139.0	101.10	672.21	174.58	846.79	470.55	87.29	557.84
140.0	101.82	689.98	174.58	864.56	482.98	87.29	570.27
141.0	102.55	707.87	174.58	882.44	495.51	87.29	582.80
142.0	103.28	725.88	174.58	900.46	508.11	87.29	595.40
143.0	104.01	744.01	184.68	928.70	520.81	92.34	613.15
144.0	104.73	762.27	195.71	957.98	533.59	97.86	631.44
145.0	105.46	780.65	207.66	988.30	546.45	103.83	650.28
146.0	106.19	799.15	220.52	1019.67	559.41	110.26	669.67
147.0	106.92	817.78	234.30	1052.08	572.45	117.15	689.60
148.0	107.64	836.53	245.33	1081.85	585.57	122.66	708.23
149.0	108.37	855.40	253.60	1109.00	598.78	126.80	725.58
150.0	109.10	874.39	259.11	1133.50	612.08	129.55	741.63

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.5809E-01	0.2696E-04	0.3412E-02	0.1000E-04
0.2904E+00	0.1348E-03	0.1706E-01	0.5000E-04
0.5809E+00	0.2696E-03	0.3412E-01	0.1000E-03
0.2927E+02	0.1354E-01	0.1706E+01	0.5000E-02
0.4391E+02	0.2031E-01	0.2559E+01	0.7500E-02
0.5855E+02	0.2708E-01	0.3412E+01	0.1000E-01
0.1464E+03	0.6770E-01	0.8529E+01	0.2500E-01
0.2910E+03	0.1350E+00	0.1706E+02	0.5000E-01
0.4047E+03	0.1935E+00	0.2559E+02	0.7500E-01
0.5084E+03	0.2492E+00	0.3412E+02	0.1000E+00
0.8057E+03	0.4897E+00	0.8529E+02	0.2500E+00
0.9623E+03	0.7888E+00	0.1309E+03	0.5000E+00
0.9820E+03	0.8954E+00	0.1451E+03	0.6000E+00
0.1061E+04	0.1823E+01	0.2241E+03	0.1500E+01
0.1085E+04	0.3332E+01	0.2513E+03	0.3000E+01

RESULT FROM UPPER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.8161E-01	0.3375E-04	0.5096E-02	0.1000E-04
0.4080E+00	0.1687E-03	0.2548E-01	0.5000E-04
0.8161E+00	0.3375E-03	0.5096E-01	0.1000E-03
0.4124E+02	0.1699E-01	0.2548E+01	0.5000E-02
0.6187E+02	0.2549E-01	0.3822E+01	0.7500E-02
0.8249E+02	0.3399E-01	0.5096E+01	0.1000E-01
0.2062E+03	0.8496E-01	0.1274E+02	0.2500E-01
0.4060E+03	0.1684E+00	0.2548E+02	0.5000E-01
0.5563E+03	0.2377E+00	0.3822E+02	0.7500E-01
0.6853E+03	0.3013E+00	0.5096E+02	0.1000E+00
0.9679E+03	0.5398E+00	0.1274E+03	0.2500E+00
0.1053E+04	0.8184E+00	0.1805E+03	0.5000E+00
0.1067E+04	0.9232E+00	0.1943E+03	0.6000E+00
0.1121E+04	0.1842E+01	0.2487E+03	0.1500E+01
0.1130E+04	0.3346E+01	0.2578E+03	0.3000E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.

0.3617E-01	0.2057E-04	0.1727E-02	0.1000E-04
0.1808E+00	0.1029E-03	0.8637E-02	0.5000E-04
0.3617E+00	0.2057E-03	0.1727E-01	0.1000E-03
0.1817E+02	0.1031E-01	0.8637E+00	0.5000E-02
0.2726E+02	0.1547E-01	0.1296E+01	0.7500E-02
0.3635E+02	0.2062E-01	0.1727E+01	0.1000E-01
0.9089E+02	0.5156E-01	0.4318E+01	0.2500E-01
0.1817E+03	0.1031E+00	0.8637E+01	0.5000E-01
0.2598E+03	0.1511E+00	0.1296E+02	0.7500E-01
0.3340E+03	0.1978E+00	0.1727E+02	0.1000E+00
0.6384E+03	0.4382E+00	0.4318E+02	0.2500E+00
0.8711E+03	0.7591E+00	0.8119E+02	0.5000E+00
0.8968E+03	0.8675E+00	0.9587E+02	0.6000E+00
0.1000E+04	0.1804E+01	0.1995E+03	0.1500E+01
0.1039E+04	0.3318E+01	0.2436E+03	0.3000E+01

South Abutment
Seismic Axial Capacity
5-ft CIDH with 6-ft Casing

```
=============================================================================

                  SHAFT for Windows, Version 2017.8.4

                   Serial Number :  253582343

                VERTICALLY LOADED DRILLED SHAFT ANALYSIS
                 (c) Copyright ENSOFT, Inc., 1987-2017
                       All Rights Reserved

=============================================================================


     Path to file locations      : C:\Users\JBonfiglio\OneDrive -
Kleinfelder\Desktop\Camino Del Mar Desktop\Pile Capacity\SHAFT Final Rev2\
     Name of input data file     : SouthAbut_Seismic_rev2.sf8d
     Name of output file         : SouthAbut_Seismic_rev2.sf8o
     Name of plot output file    : SouthAbut_Seismic_rev2.sf8p
     Name of runtime file        : SouthAbut_Seismic_rev2.sf8r


     ---------------------------------------------------------------------
                         Time and Date of Analysis
     ---------------------------------------------------------------------

               Date:  May 18, 2020     Time:  12:02:35

     Camino Del Mar Bridge Replacement - Phase 0


     PROPOSED DEPTH =     150.0 FT
     ----------------


     NUMBER OF LAYERS =    8
     ------------------


     WATER TABLE DEPTH =      10.0 FT.
     -------------------




     SOIL INFORMATION
     ---------------

     LAYER NO 1----SAND
```

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.120E+01
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.000E+00

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.110E+01
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.900E+01

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.100E+01
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.100E+01

LAYER NO 2----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA = 0.550E+00 (*)
END BEARING COEFFICIENT-Nc = 0.816E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.450E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.900E+01

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA = 0.550E+00 (*)
END BEARING COEFFICIENT-Nc = 0.900E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.450E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.300E+02

```
  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E+01


LAYER NO 3----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.700E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.300E+02


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.700E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.780E+02


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E+01


LAYER NO 4----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.750E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.115E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.780E+02


  AT THE BOTTOM
```

```
  STRENGTH REDUCTION FACTOR-ALPHA                    = 0.550E+00
  END BEARING COEFFICIENT-Nc                         = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                 = 0.750E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.115E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.940E+02


  LRFD RESISTANCE FACTOR (SIDE FRICTION)             = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)            = 0.100E+01


LAYER NO 5----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                    = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                      = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.940E+02

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                    = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                      = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.152E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)             = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)            = 0.100E+01


LAYER NO 6----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                    = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                      = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.130E+03
```

```
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.152E+03

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.201E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E+01


LAYER NO 7----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.201E+03

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.231E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E+01


LAYER NO 8----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.510E+00
```

```
  END BEARING COEFFICIENT-Nc                          = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                  = 0.400E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST       = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                          = 0.135E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT            = 0.100E+11
  DEPTH, FT                                           = 0.231E+03


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                     = 0.510E+00
  END BEARING COEFFICIENT-Nc                          = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                  = 0.400E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST       = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                          = 0.135E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT            = 0.100E+11
  DEPTH, FT                                           = 0.266E+03


  LRFD RESISTANCE FACTOR (SIDE FRICTION)              = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)             = 0.100E+01



(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS



INPUT DRILLED SHAFT INFORMATION
-------------------------------

 MINIMUM SHAFT DIAMETER    =    5.000  FT.
 MAXIMUM SHAFT DIAMETER    =    5.000  FT.
 RATIO BASE/SHAFT DIAMETER =    0.000  FT.
 ANGLE OF BELL             =    0.000  DEG.
 IGNORED TOP PORTION       =   94.000  FT.
 IGNORED BOTTOM PORTION    =    0.000  FT.
 ELASTIC MODULUS, Ec       = 0.360E+07 LB/SQ IN




COMPUTATION RESULTS
-------------------
```

```
- CASE ANALYZED      :     1
  VARIATION LENGTH   :     1
  VARIATION DIAMETER :     1



DRILLED SHAFT INFORMATION

-------------------------

 DIAMETER OF STEM          =    5.000  FT.
 DIAMETER OF BASE          =    5.000  FT.
 END OF STEM TO BASE       =    0.000  FT.
 ANGLE OF BELL             =    0.000  DEG.
 IGNORED TOP PORTION       =   94.000  FT.
 IGNORED BOTTOM PORTION    =    0.000  FT.
 AREA OF ONE PERCENT STEEL =   28.278  SQ.IN.
 ELASTIC MODULUS, Ec       = 0.360E+07 LB/SQ IN
 VOLUME OF UNDERREAM       =    0.000  CU.YDS.
 SHAFT LENGTH              =  150.000  FT.


PREDICTED RESULTS
-----------------

QS      = ULTIMATE SIDE RESISTANCE;
QB      = ULTIMATE BASE RESISTANCE;
WT      = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU      = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR
          TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR
          TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

 LENGTH  VOLUME     QS      QB      QU     LRFD QS  LRFD QB   LRFD QU
  (FT)   (CU.YDS) (TONS)   (TONS)  (TONS)   (TONS)   (TONS)    (TONS)
 95.0    69.09    12.23   174.58   186.81    12.23   174.58    186.81
 96.0    69.82    24.59   174.58   199.17    24.59   174.58    199.17
 97.0    70.55    37.07   174.58   211.65    37.07   174.58    211.65
 98.0    71.28    49.67   174.58   224.25    49.67   174.58    224.25
 99.0    72.00    62.40   174.58   236.97    62.40   174.58    236.97
100.0    72.73    75.25   174.58   249.82    75.25   174.58    249.82
101.0    73.46    88.22   174.58   262.79    88.22   174.58    262.79
102.0    74.19   101.31   174.58   275.89   101.31   174.58    275.89
103.0    74.91   114.53   174.58   289.11   114.53   174.58    289.11
104.0    75.64   127.87   174.58   302.45   127.87   174.58    302.45
```

105.0	76.37	141.33	174.58	315.91	141.33	174.58	315.91
106.0	77.10	154.92	174.58	329.49	154.92	174.58	329.49
107.0	77.82	168.63	174.58	343.20	168.63	174.58	343.20
108.0	78.55	182.46	174.58	357.03	182.46	174.58	357.03
109.0	79.28	196.41	174.58	370.99	196.41	174.58	370.99
110.0	80.00	210.49	174.58	385.07	210.49	174.58	385.07
111.0	80.73	224.69	174.58	399.27	224.69	174.58	399.27
112.0	81.46	239.01	174.58	413.59	239.01	174.58	413.59
113.0	82.19	253.46	174.58	428.04	253.46	174.58	428.04
114.0	82.91	268.03	174.58	442.61	268.03	174.58	442.61
115.0	83.64	282.72	174.58	457.30	282.72	174.58	457.30
116.0	84.37	297.54	174.58	472.11	297.54	174.58	472.11
117.0	85.10	312.47	174.58	487.05	312.47	174.58	487.05
118.0	85.82	327.54	174.58	502.11	327.54	174.58	502.11
119.0	86.55	342.72	174.58	517.30	342.72	174.58	517.30
120.0	87.28	358.03	174.58	532.60	358.03	174.58	532.60
121.0	88.01	373.46	174.58	548.03	373.46	174.58	548.03
122.0	88.73	389.01	174.58	563.59	389.01	174.58	563.59
123.0	89.46	404.68	174.58	579.26	404.68	174.58	579.26
124.0	90.19	420.48	174.58	595.06	420.48	174.58	595.06
125.0	90.91	436.40	174.58	610.98	436.40	174.58	610.98
126.0	91.64	452.45	174.58	627.03	452.45	174.58	627.03
127.0	92.37	468.62	174.58	643.19	468.62	174.58	643.19
128.0	93.10	484.91	174.58	659.48	484.91	174.58	659.48
129.0	93.82	501.32	174.58	675.90	501.32	174.58	675.90
130.0	94.55	517.86	174.58	692.43	517.86	174.58	692.43
131.0	95.28	534.51	174.58	709.09	534.51	174.58	709.09
132.0	96.01	551.30	174.58	725.87	551.30	174.58	725.87
133.0	96.73	568.20	174.58	742.78	568.20	174.58	742.78
134.0	97.46	585.23	174.58	759.81	585.23	174.58	759.81
135.0	98.19	602.38	174.58	776.96	602.38	174.58	776.96
136.0	98.91	619.65	174.58	794.23	619.65	174.58	794.23
137.0	99.64	637.05	174.58	811.63	637.05	174.58	811.63
138.0	100.37	654.57	174.58	829.15	654.57	174.58	829.15
139.0	101.10	672.21	174.58	846.79	672.21	174.58	846.79
140.0	101.82	689.98	174.58	864.56	689.98	174.58	864.56
141.0	102.55	707.87	174.58	882.44	707.87	174.58	882.44
142.0	103.28	725.88	174.58	900.46	725.88	174.58	900.46
143.0	104.01	744.01	184.68	928.70	744.01	184.68	928.70
144.0	104.73	762.27	195.71	957.98	762.27	195.71	957.98
145.0	105.46	780.65	207.66	988.30	780.65	207.66	988.30
146.0	106.19	799.15	220.52	1019.67	799.15	220.52	1019.67
147.0	106.92	817.78	234.30	1052.08	817.78	234.30	1052.08
148.0	107.64	836.53	245.33	1081.85	836.53	245.33	1081.85
149.0	108.37	855.40	253.60	1109.00	855.40	253.60	1109.00
150.0	109.10	874.39	259.11	1133.50	874.39	259.11	1133.50

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.5809E-01	0.2696E-04	0.3412E-02	0.1000E-04
0.2904E+00	0.1348E-03	0.1706E-01	0.5000E-04
0.5809E+00	0.2696E-03	0.3412E-01	0.1000E-03
0.2927E+02	0.1354E-01	0.1706E+01	0.5000E-02
0.4391E+02	0.2031E-01	0.2559E+01	0.7500E-02
0.5855E+02	0.2708E-01	0.3412E+01	0.1000E-01
0.1464E+03	0.6770E-01	0.8529E+01	0.2500E-01
0.2910E+03	0.1350E+00	0.1706E+02	0.5000E-01
0.4047E+03	0.1935E+00	0.2559E+02	0.7500E-01
0.5084E+03	0.2492E+00	0.3412E+02	0.1000E+00
0.8057E+03	0.4897E+00	0.8529E+02	0.2500E+00
0.9623E+03	0.7888E+00	0.1309E+03	0.5000E+00
0.9820E+03	0.8954E+00	0.1451E+03	0.6000E+00
0.1061E+04	0.1823E+01	0.2241E+03	0.1500E+01
0.1085E+04	0.3332E+01	0.2513E+03	0.3000E+01

RESULT FROM UPPER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.8161E-01	0.3375E-04	0.5096E-02	0.1000E-04
0.4080E+00	0.1687E-03	0.2548E-01	0.5000E-04
0.8161E+00	0.3375E-03	0.5096E-01	0.1000E-03
0.4124E+02	0.1699E-01	0.2548E+01	0.5000E-02
0.6187E+02	0.2549E-01	0.3822E+01	0.7500E-02
0.8249E+02	0.3399E-01	0.5096E+01	0.1000E-01
0.2062E+03	0.8496E-01	0.1274E+02	0.2500E-01
0.4060E+03	0.1684E+00	0.2548E+02	0.5000E-01
0.5563E+03	0.2377E+00	0.3822E+02	0.7500E-01
0.6853E+03	0.3013E+00	0.5096E+02	0.1000E+00
0.9679E+03	0.5398E+00	0.1274E+03	0.2500E+00
0.1053E+04	0.8184E+00	0.1805E+03	0.5000E+00
0.1067E+04	0.9232E+00	0.1943E+03	0.6000E+00
0.1121E+04	0.1842E+01	0.2487E+03	0.1500E+01
0.1130E+04	0.3346E+01	0.2578E+03	0.3000E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.3617E-01	0.2057E-04	0.1727E-02	0.1000E-04
0.1808E+00	0.1029E-03	0.8637E-02	0.5000E-04
0.3617E+00	0.2057E-03	0.1727E-01	0.1000E-03
0.1817E+02	0.1031E-01	0.8637E+00	0.5000E-02
0.2726E+02	0.1547E-01	0.1296E+01	0.7500E-02
0.3635E+02	0.2062E-01	0.1727E+01	0.1000E-01
0.9089E+02	0.5156E-01	0.4318E+01	0.2500E-01
0.1817E+03	0.1031E+00	0.8637E+01	0.5000E-01
0.2598E+03	0.1511E+00	0.1296E+02	0.7500E-01
0.3340E+03	0.1978E+00	0.1727E+02	0.1000E+00
0.6384E+03	0.4382E+00	0.4318E+02	0.2500E+00
0.8711E+03	0.7591E+00	0.8119E+02	0.5000E+00
0.8968E+03	0.8675E+00	0.9587E+02	0.6000E+00
0.1000E+04	0.1804E+01	0.1995E+03	0.1500E+01
0.1039E+04	0.3318E+01	0.2436E+03	0.3000E+01

Piers
Static Axial Capacity
6-ft CIDH with 7-ft Casing

SHAFT for Windows, Version 2017.8.4

Serial Number : 253582343

VERTICALLY LOADED DRILLED SHAFT ANALYSIS
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Path to file locations : C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Pile Capacity\SHAFT Final Rev2\
Name of input data file : Piers_6ft_Final_Rev.sf8d
Name of output file : Piers_6ft_Final_Rev.sf8o
Name of plot output file : Piers_6ft_Final_Rev.sf8p
Name of runtime file : Piers_6ft_Final_Rev.sf8r

Time and Date of Analysis

Date: May 18, 2020 Time: 11:27:17

Camino Del Mar Bridge Replacement - Phase 0

TOTAL LOAD = 1100.0 TONS

NUMBER OF LAYERS = 8

WATER TABLE DEPTH = 0.0 FT.

SOIL INFORMATION

LAYER NO 1----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.100E+01
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.000E+00

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.690E+00
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.120E+02

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.680E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 2----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA = 0.550E+00
END BEARING COEFFICIENT-Nc = 0.840E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.110E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.120E+02

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA = 0.550E+00
END BEARING COEFFICIENT-Nc = 0.900E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.110E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.190E+02

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.680E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 3----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.610E+00
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.190E+02

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.470E+00
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.350E+02

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.680E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 4----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.700E+00
INTERNAL FRICTION ANGLE, DEG. = 0.320E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.125E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.350E+02

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.410E+00
INTERNAL FRICTION ANGLE, DEG. = 0.320E+02

```
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.650E+02

  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.680E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 5----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.750E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.115E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.650E+02


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.750E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.115E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.820E+02


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.680E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 6----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.280E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.820E+02
```

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.125E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.122E+03

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.680E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 7----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.360E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.130E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.122E+03

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.360E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.130E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.207E+03

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.680E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 8----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA = 0.510E+00
END BEARING COEFFICIENT-Nc = 0.900E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+04

```
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.135E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.207E+03


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.510E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.400E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.135E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.255E+03


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.680E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS


INPUT DRILLED SHAFT INFORMATION
-------------------------------

 MINIMUM SHAFT DIAMETER    =    6.000  FT.
 MAXIMUM SHAFT DIAMETER    =    6.000  FT.
 RATIO BASE/SHAFT DIAMETER =    0.000  FT.
 ANGLE OF BELL             =    0.000  DEG.
 IGNORED TOP PORTION       =   82.000  FT.
 IGNORED BOTTOM PORTION    =    0.000  FT.
 ELASTIC MODULUS, Ec       = 0.360E+07 LB/SQ IN




COMPUTATION RESULTS
-------------------


- CASE ANALYZED      :     1
```

VARIATION LENGTH : 1
VARIATION DIAMETER : 1

DRILLED SHAFT INFORMATION

DIAMETER OF STEM = 6.000 FT.
DIAMETER OF BASE = 6.000 FT.
END OF STEM TO BASE = 0.000 FT.
ANGLE OF BELL = 0.000 DEG.
IGNORED TOP PORTION = 82.000 FT.
IGNORED BOTTOM PORTION = 0.000 FT.
AREA OF ONE PERCENT STEEL = 40.720 SQ.IN.
ELASTIC MODULUS, Ec = 0.360E+07 LB/SQ IN
VOLUME OF UNDERREAM = 0.000 CU.YDS.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
83.0	86.93	12.50	209.49	221.99	8.50	104.75	113.25
84.0	87.98	25.13	209.49	234.63	17.09	104.75	121.84
85.0	89.02	37.90	209.49	247.39	25.77	104.75	130.52
86.0	90.07	50.79	209.49	260.28	34.54	104.75	139.28
87.0	91.12	63.81	209.49	273.30	43.39	104.75	148.14
88.0	92.17	76.95	209.49	286.45	52.33	104.75	157.08
89.0	93.21	90.23	209.49	299.72	61.35	104.75	166.10
90.0	94.26	103.63	209.49	313.12	70.47	104.75	175.21
91.0	95.31	117.15	209.49	326.64	79.66	104.75	184.41
92.0	96.35	130.79	209.49	340.29	88.94	104.75	193.69
93.0	97.40	144.56	209.49	354.06	98.30	104.75	203.05
94.0	98.45	158.46	209.49	367.95	107.75	104.75	212.50
95.0	99.50	172.47	209.49	381.96	117.28	104.75	222.02

96.0	100.54	186.60	209.49	396.09	126.89	104.75	231.63
97.0	101.59	200.85	209.49	410.35	136.58	104.75	241.33
98.0	102.64	215.22	209.49	424.72	146.35	104.75	251.10
99.0	103.69	229.71	209.49	439.20	156.20	104.75	260.95
100.0	104.73	244.31	209.49	453.81	166.13	104.75	270.88
101.0	105.78	259.03	209.49	468.53	176.14	104.75	280.89
102.0	106.83	273.87	209.49	483.36	186.23	104.75	290.98
103.0	107.88	288.82	209.49	498.31	196.40	104.75	301.14
104.0	108.92	303.88	209.49	513.37	206.64	104.75	311.38
105.0	109.97	319.05	209.49	528.55	216.96	104.75	321.70
106.0	111.02	334.34	209.49	543.83	227.35	104.75	332.10
107.0	112.06	349.73	209.49	559.23	237.82	104.75	342.57
108.0	113.11	365.24	209.49	574.73	248.36	104.75	353.11
109.0	114.16	380.85	209.49	590.35	258.98	104.75	363.73
110.0	115.21	396.57	209.49	606.07	269.67	104.75	374.42
111.0	116.25	412.40	219.36	631.76	280.43	109.68	390.11
112.0	117.30	428.34	229.99	658.32	291.27	114.99	406.26
113.0	118.35	444.38	241.37	685.75	302.18	120.69	422.86
114.0	119.40	460.52	253.52	714.04	313.15	126.76	439.91
115.0	120.44	476.77	266.42	743.19	324.20	133.21	457.41
116.0	121.49	493.12	280.08	773.20	335.32	140.04	475.36
117.0	122.54	509.57	291.47	801.04	346.51	145.73	492.24
118.0	123.59	526.12	300.58	826.70	357.76	150.29	508.05
119.0	124.63	542.77	307.41	850.18	369.08	153.70	522.79
120.0	125.68	559.52	311.96	871.48	380.47	155.98	536.45
121.0	126.73	576.37	314.24	890.61	391.93	157.12	549.05
122.0	127.77	593.31	314.24	907.55	403.45	157.12	560.57
123.0	128.82	610.41	314.24	924.65	415.08	157.12	572.20
124.0	129.87	627.67	314.24	941.91	426.82	157.12	583.94
125.0	130.92	645.09	314.24	959.33	438.66	157.12	595.78
126.0	131.96	662.66	314.24	976.90	450.61	157.12	607.73
127.0	133.01	680.40	314.24	994.64	462.67	157.12	619.79
128.0	134.06	698.30	314.24	1012.54	474.84	157.12	631.96
129.0	135.11	716.35	314.24	1030.59	487.12	157.12	644.24
130.0	136.15	734.56	314.24	1048.80	499.50	157.12	656.62
131.0	137.20	752.94	314.24	1067.18	512.00	157.12	669.12
132.0	138.25	771.47	314.24	1085.71	524.60	157.12	681.72
133.0	139.30	790.16	314.24	1104.40	537.31	157.12	694.43
134.0	140.34	809.01	314.24	1123.25	550.13	157.12	707.25
135.0	141.39	828.02	314.24	1142.26	563.06	157.12	720.18
136.0	142.44	847.19	314.24	1161.43	576.09	157.12	733.21
137.0	143.48	866.52	314.24	1180.76	589.23	157.12	746.35
138.0	144.53	886.01	314.24	1200.25	602.49	157.12	759.61
139.0	145.58	905.66	314.24	1219.90	615.85	157.12	772.97
140.0	146.63	925.46	314.24	1239.70	629.32	157.12	786.44
141.0	147.67	945.43	314.24	1259.67	642.89	157.12	800.01
142.0	148.72	965.56	314.24	1279.80	656.58	157.12	813.70
143.0	149.77	985.84	314.24	1300.08	670.37	157.12	827.49

144.0	150.82	1006.29	314.24	1320.52	684.27	157.12	841.39
145.0	151.86	1026.89	314.24	1341.13	698.28	157.12	855.40
146.0	152.91	1047.65	314.24	1361.89	712.40	157.12	869.52
147.0	153.96	1068.57	314.24	1382.81	726.63	157.12	883.75
148.0	155.01	1089.65	314.24	1403.89	740.97	157.12	898.08
149.0	156.05	1110.90	314.24	1425.13	755.41	157.12	912.53
150.0	157.10	1132.29	314.24	1446.53	769.96	157.12	927.08
151.0	158.15	1153.85	314.24	1468.09	784.62	157.12	941.74
152.0	159.19	1175.57	314.24	1489.81	799.39	157.12	956.51
153.0	160.24	1197.45	314.24	1511.69	814.27	157.12	971.39
154.0	161.29	1219.49	314.24	1533.73	829.25	157.12	986.37
155.0	162.34	1241.68	314.24	1555.92	844.34	157.12	1001.46
156.0	163.38	1264.04	314.24	1578.28	859.55	157.12	1016.67
157.0	164.43	1286.55	314.24	1600.79	874.86	157.12	1031.98
158.0	165.48	1309.23	314.24	1623.47	890.28	157.12	1047.40
159.0	166.53	1332.06	314.24	1646.30	905.80	157.12	1062.92
160.0	167.57	1355.05	314.24	1669.29	921.44	157.12	1078.56
161.0	168.62	1378.21	314.24	1692.45	937.18	157.12	1094.30
162.0	169.67	1401.52	314.24	1715.76	953.03	157.12	1110.15

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.8041E-01	0.2628E-04	0.3448E-02	0.1000E-04
0.4021E+00	0.1314E-03	0.1724E-01	0.5000E-04
0.8041E+00	0.2628E-03	0.3448E-01	0.1000E-03
0.4043E+02	0.1318E-01	0.1724E+01	0.5000E-02
0.6065E+02	0.1977E-01	0.2586E+01	0.7500E-02
0.8086E+02	0.2637E-01	0.3448E+01	0.1000E-01
0.2022E+03	0.6592E-01	0.8620E+01	0.2500E-01
0.4034E+03	0.1317E+00	0.1724E+02	0.5000E-01
0.5743E+03	0.1922E+00	0.2586E+02	0.7500E-01
0.7171E+03	0.2466E+00	0.3448E+02	0.1000E+00
0.1185E+04	0.4971E+00	0.8620E+02	0.2500E+00
0.1462E+04	0.8086E+00	0.1443E+03	0.5000E+00
0.1523E+04	0.1043E+01	0.1760E+03	0.7200E+00
0.1616E+04	0.2148E+01	0.2718E+03	0.1800E+01
0.1644E+04	0.3956E+01	0.3048E+03	0.3600E+01

RESULT FROM UPPER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1145E+00	0.3301E-04	0.5150E-02	0.1000E-04
0.5726E+00	0.1651E-03	0.2575E-01	0.5000E-04
0.1145E+01	0.3301E-03	0.5150E-01	0.1000E-03
0.5769E+02	0.1658E-01	0.2575E+01	0.5000E-02
0.8655E+02	0.2488E-01	0.3863E+01	0.7500E-02
0.1154E+03	0.3317E-01	0.5150E+01	0.1000E-01
0.2885E+03	0.8293E-01	0.1288E+02	0.2500E-01
0.5701E+03	0.1649E+00	0.2575E+02	0.5000E-01
0.7972E+03	0.2372E+00	0.3863E+02	0.7500E-01
0.9784E+03	0.2999E+00	0.5150E+02	0.1000E+00
0.1448E+04	0.5542E+00	0.1288E+03	0.2500E+00
0.1610E+04	0.8429E+00	0.2050E+03	0.5000E+00
0.1640E+04	0.1071E+01	0.2357E+03	0.7200E+00
0.1704E+04	0.2168E+01	0.3017E+03	0.1800E+01
0.1715E+04	0.3971E+01	0.3127E+03	0.3600E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.4939E-01	0.2007E-04	0.1746E-02	0.1000E-04
0.2470E+00	0.1004E-03	0.8729E-02	0.5000E-04
0.4939E+00	0.2007E-03	0.1746E-01	0.1000E-03
0.2478E+02	0.1005E-01	0.8729E+00	0.5000E-02
0.3718E+02	0.1508E-01	0.1309E+01	0.7500E-02
0.4957E+02	0.2011E-01	0.1746E+01	0.1000E-01
0.1239E+03	0.5027E-01	0.4364E+01	0.2500E-01
0.2479E+03	0.1005E+00	0.8729E+01	0.5000E-01
0.3627E+03	0.1492E+00	0.1309E+02	0.7500E-01
0.4632E+03	0.1948E+00	0.1746E+02	0.1000E+00
0.9120E+03	0.4384E+00	0.4364E+02	0.2500E+00
0.1312E+04	0.7737E+00	0.8362E+02	0.5000E+00
0.1405E+04	0.1015E+01	0.1163E+03	0.7200E+00
0.1527E+04	0.2128E+01	0.2420E+03	0.1800E+01
0.1572E+04	0.3941E+01	0.2954E+03	0.3600E+01

Piers
Seismic Axial Capacity
6-ft CIDH with 7-ft Casing

SHAFT for Windows, Version 2017.8.4

Serial Number : 253582343

VERTICALLY LOADED DRILLED SHAFT ANALYSIS
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Path to file locations : C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Pile Capacity\SHAFT Final Rev2\
Name of input data file : Piers_6ft_Seismic_Final_Rev.sf8d
Name of output file : Piers_6ft_Seismic_Final_Rev.sf8o
Name of plot output file : Piers_6ft_Seismic_Final_Rev.sf8p
Name of runtime file : Piers_6ft_Seismic_Final_Rev.sf8r

Time and Date of Analysis

Date: May 18, 2020 Time: 11:23:03

Camino Del Mar Bridge Replacement - Phase 0

PROPOSED DEPTH = 180.0 FT

NUMBER OF LAYERS = 8

WATER TABLE DEPTH = 0.0 FT.

SOIL INFORMATION

LAYER NO 1----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.600E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.000E+00	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.840E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.120E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 2----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.840E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.110E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.120E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.110E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	

DEPTH, FT	= 0.190E+02	
LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 3----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.450E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.190E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.450E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.350E+02	
LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 4----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.700E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.350E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.700E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.650E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 5----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.750E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.115E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.650E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.750E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.115E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.820E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 6----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD

```
  SKIN FRICTION COEFFICIENT- BETA                    = 0.280E+00
  INTERNAL FRICTION ANGLE, DEG.                      = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.820E+02

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                    = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                      = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.122E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)             = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)            = 0.100E+01


LAYER NO 7----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                    = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                      = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.122E+03

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                    = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                      = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.207E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)             = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)            = 0.100E+01


LAYER NO 8----CLAY
```

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.510E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+04	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.135E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.207E+03	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.510E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+04	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.135E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.255E+03	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01

(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS

INPUT DRILLED SHAFT INFORMATION

MINIMUM SHAFT DIAMETER	= 6.000	FT.
MAXIMUM SHAFT DIAMETER	= 6.000	FT.
RATIO BASE/SHAFT DIAMETER	= 0.000	FT.
ANGLE OF BELL	= 0.000	DEG.
IGNORED TOP PORTION	= 82.000	FT.
IGNORED BOTTOM PORTION	= 0.000	FT.
ELASTIC MODULUS, Ec	= 0.360E+07	LB/SQ IN

COMPUTATION RESULTS

- CASE ANALYZED : 1
  VARIATION LENGTH : 1
  VARIATION DIAMETER : 1

DRILLED SHAFT INFORMATION

DIAMETER OF STEM	= 6.000	FT.
DIAMETER OF BASE	= 6.000	FT.
END OF STEM TO BASE	= 0.000	FT.
ANGLE OF BELL	= 0.000	DEG.
IGNORED TOP PORTION	= 82.000	FT.
IGNORED BOTTOM PORTION	= 0.000	FT.
AREA OF ONE PERCENT STEEL	= 40.720	SQ.IN.
ELASTIC MODULUS, Ec	= 0.360E+07	LB/SQ IN
VOLUME OF UNDERREAM	= 0.000	CU.YDS.
SHAFT LENGTH	= 180.000	FT.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
83.0	86.93	12.50	209.49	221.99	12.50	209.49	221.99
84.0	87.98	25.13	209.49	234.63	25.13	209.49	234.63
85.0	89.02	37.90	209.49	247.39	37.90	209.49	247.39
86.0	90.07	50.79	209.49	260.28	50.79	209.49	260.28
87.0	91.12	63.81	209.49	273.30	63.81	209.49	273.30
88.0	92.17	76.95	209.49	286.45	76.95	209.49	286.45

89.0	93.21	90.23	209.49	299.72	90.23	209.49	299.72
90.0	94.26	103.63	209.49	313.12	103.63	209.49	313.12
91.0	95.31	117.15	209.49	326.64	117.15	209.49	326.64
92.0	96.35	130.79	209.49	340.29	130.79	209.49	340.29
93.0	97.40	144.56	209.49	354.06	144.56	209.49	354.06
94.0	98.45	158.46	209.49	367.95	158.46	209.49	367.95
95.0	99.50	172.47	209.49	381.96	172.47	209.49	381.96
96.0	100.54	186.60	209.49	396.09	186.60	209.49	396.09
97.0	101.59	200.85	209.49	410.35	200.85	209.49	410.35
98.0	102.64	215.22	209.49	424.72	215.22	209.49	424.72
99.0	103.69	229.71	209.49	439.20	229.71	209.49	439.20
100.0	104.73	244.31	209.49	453.81	244.31	209.49	453.81
101.0	105.78	259.03	209.49	468.53	259.03	209.49	468.53
102.0	106.83	273.87	209.49	483.36	273.87	209.49	483.36
103.0	107.88	288.82	209.49	498.31	288.82	209.49	498.31
104.0	108.92	303.88	209.49	513.37	303.88	209.49	513.37
105.0	109.97	319.05	209.49	528.55	319.05	209.49	528.55
106.0	111.02	334.34	209.49	543.83	334.34	209.49	543.83
107.0	112.06	349.73	209.49	559.23	349.73	209.49	559.23
108.0	113.11	365.24	209.49	574.73	365.24	209.49	574.73
109.0	114.16	380.85	209.49	590.35	380.85	209.49	590.35
110.0	115.21	396.57	209.49	606.07	396.57	209.49	606.07
111.0	116.25	412.40	219.36	631.76	412.40	219.36	631.76
112.0	117.30	428.34	229.99	658.32	428.34	229.99	658.32
113.0	118.35	444.38	241.37	685.75	444.38	241.37	685.75
114.0	119.40	460.52	253.52	714.04	460.52	253.52	714.04
115.0	120.44	476.77	266.42	743.19	476.77	266.42	743.19
116.0	121.49	493.12	280.08	773.20	493.12	280.08	773.20
117.0	122.54	509.57	291.47	801.04	509.57	291.47	801.04
118.0	123.59	526.12	300.58	826.70	526.12	300.58	826.70
119.0	124.63	542.77	307.41	850.18	542.77	307.41	850.18
120.0	125.68	559.52	311.96	871.48	559.52	311.96	871.48
121.0	126.73	576.37	314.24	890.61	576.37	314.24	890.61
122.0	127.77	593.31	314.24	907.55	593.31	314.24	907.55
123.0	128.82	610.41	314.24	924.65	610.41	314.24	924.65
124.0	129.87	627.67	314.24	941.91	627.67	314.24	941.91
125.0	130.92	645.09	314.24	959.33	645.09	314.24	959.33
126.0	131.96	662.66	314.24	976.90	662.66	314.24	976.90
127.0	133.01	680.40	314.24	994.64	680.40	314.24	994.64
128.0	134.06	698.30	314.24	1012.54	698.30	314.24	1012.54
129.0	135.11	716.35	314.24	1030.59	716.35	314.24	1030.59
130.0	136.15	734.56	314.24	1048.80	734.56	314.24	1048.80
131.0	137.20	752.94	314.24	1067.18	752.94	314.24	1067.18
132.0	138.25	771.47	314.24	1085.71	771.47	314.24	1085.71
133.0	139.30	790.16	314.24	1104.40	790.16	314.24	1104.40
134.0	140.34	809.01	314.24	1123.25	809.01	314.24	1123.25
135.0	141.39	828.02	314.24	1142.26	828.02	314.24	1142.26
136.0	142.44	847.19	314.24	1161.43	847.19	314.24	1161.43

137.0	143.48	866.52	314.24	1180.76	866.52	314.24	1180.76
138.0	144.53	886.01	314.24	1200.25	886.01	314.24	1200.25
139.0	145.58	905.66	314.24	1219.90	905.66	314.24	1219.90
140.0	146.63	925.46	314.24	1239.70	925.46	314.24	1239.70
141.0	147.67	945.43	314.24	1259.67	945.43	314.24	1259.67
142.0	148.72	965.56	314.24	1279.80	965.56	314.24	1279.80
143.0	149.77	985.84	314.24	1300.08	985.84	314.24	1300.08
144.0	150.82	1006.29	314.24	1320.52	1006.29	314.24	1320.52
145.0	151.86	1026.89	314.24	1341.13	1026.89	314.24	1341.13
146.0	152.91	1047.65	314.24	1361.89	1047.65	314.24	1361.89
147.0	153.96	1068.57	314.24	1382.81	1068.57	314.24	1382.81
148.0	155.01	1089.65	314.24	1403.89	1089.65	314.24	1403.89
149.0	156.05	1110.90	314.24	1425.13	1110.90	314.24	1425.13
150.0	157.10	1132.29	314.24	1446.53	1132.29	314.24	1446.53
151.0	158.15	1153.85	314.24	1468.09	1153.85	314.24	1468.09
152.0	159.19	1175.57	314.24	1489.81	1175.57	314.24	1489.81
153.0	160.24	1197.45	314.24	1511.69	1197.45	314.24	1511.69
154.0	161.29	1219.49	314.24	1533.73	1219.49	314.24	1533.73
155.0	162.34	1241.68	314.24	1555.92	1241.68	314.24	1555.92
156.0	163.38	1264.04	314.24	1578.28	1264.04	314.24	1578.28
157.0	164.43	1286.55	314.24	1600.79	1286.55	314.24	1600.79
158.0	165.48	1309.23	314.24	1623.47	1309.23	314.24	1623.47
159.0	166.53	1332.06	314.24	1646.30	1332.06	314.24	1646.30
160.0	167.57	1355.05	314.24	1669.29	1355.05	314.24	1669.29
161.0	168.62	1378.21	314.24	1692.45	1378.21	314.24	1692.45
162.0	169.67	1401.52	314.24	1715.76	1401.52	314.24	1715.76
163.0	170.72	1424.99	314.24	1739.23	1424.99	314.24	1739.23
164.0	171.76	1448.62	314.24	1762.86	1448.62	314.24	1762.86
165.0	172.81	1472.41	314.24	1786.65	1472.41	314.24	1786.65
166.0	173.86	1496.36	314.24	1810.60	1496.36	314.24	1810.60
167.0	174.90	1520.46	314.24	1834.70	1520.46	314.24	1834.70
168.0	175.95	1544.73	314.24	1858.97	1544.73	314.24	1858.97
169.0	177.00	1569.16	314.24	1883.40	1569.16	314.24	1883.40
170.0	178.05	1593.74	314.24	1907.98	1593.74	314.24	1907.98
171.0	179.09	1618.49	314.24	1932.73	1618.49	314.24	1932.73
172.0	180.14	1643.39	314.24	1957.63	1643.39	314.24	1957.63
173.0	181.19	1668.46	314.24	1982.70	1668.46	314.24	1982.70
174.0	182.24	1693.68	314.24	2007.92	1693.68	314.24	2007.92
175.0	183.28	1719.06	314.24	2033.30	1719.06	314.24	2033.30
176.0	184.33	1744.60	314.24	2058.84	1744.60	314.24	2058.84
177.0	185.38	1770.31	314.24	2084.54	1770.31	314.24	2084.54
178.0	186.43	1796.17	314.24	2110.41	1796.17	314.24	2110.41
179.0	187.47	1822.19	314.24	2136.42	1822.19	314.24	2136.42
180.0	188.52	1848.36	314.24	2162.60	1848.36	314.24	2162.60

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1101E+00	0.3400E-04	0.3448E-02	0.1000E-04
0.5506E+00	0.1700E-03	0.1724E-01	0.5000E-04
0.1101E+01	0.3400E-03	0.3448E-01	0.1000E-03
0.5541E+02	0.1707E-01	0.1724E+01	0.5000E-02
0.8313E+02	0.2561E-01	0.2586E+01	0.7500E-02
0.1108E+03	0.3414E-01	0.3448E+01	0.1000E-01
0.2771E+03	0.8536E-01	0.8620E+01	0.2500E-01
0.5482E+03	0.1698E+00	0.1724E+02	0.5000E-01
0.7760E+03	0.2458E+00	0.2586E+02	0.7500E-01
0.9603E+03	0.3122E+00	0.3448E+02	0.1000E+00
0.1537E+04	0.5977E+00	0.8620E+02	0.2500E+00
0.1864E+04	0.9274E+00	0.1443E+03	0.5000E+00
0.1931E+04	0.1165E+01	0.1760E+03	0.7200E+00
0.2024E+04	0.2273E+01	0.2718E+03	0.1800E+01
0.2052E+04	0.4081E+01	0.3048E+03	0.3600E+01

RESULT FROM UPPER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1598E+00	0.4444E-04	0.5150E-02	0.1000E-04
0.7989E+00	0.2222E-03	0.2575E-01	0.5000E-04
0.1598E+01	0.4444E-03	0.5150E-01	0.1000E-03
0.8059E+02	0.2235E-01	0.2575E+01	0.5000E-02
0.1209E+03	0.3353E-01	0.3863E+01	0.7500E-02
0.1612E+03	0.4471E-01	0.5150E+01	0.1000E-01
0.4030E+03	0.1118E+00	0.1288E+02	0.2500E-01
0.7837E+03	0.2200E+00	0.2575E+02	0.5000E-01
0.1088E+04	0.3132E+00	0.3863E+02	0.7500E-01
0.1312E+04	0.3895E+00	0.5150E+02	0.1000E+00
0.1860E+04	0.6740E+00	0.1288E+03	0.2500E+00
0.2033E+04	0.9702E+00	0.2050E+03	0.5000E+00
0.2063E+04	0.1199E+01	0.2357E+03	0.7200E+00
0.2129E+04	0.2299E+01	0.3017E+03	0.1800E+01
0.2140E+04	0.4102E+01	0.3127E+03	0.3600E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.6650E-01	0.2465E-04	0.1746E-02	0.1000E-04
0.3325E+00	0.1233E-03	0.8729E-02	0.5000E-04
0.6650E+00	0.2465E-03	0.1746E-01	0.1000E-03
0.3338E+02	0.1235E-01	0.8729E+00	0.5000E-02
0.5008E+02	0.1853E-01	0.1309E+01	0.7500E-02
0.6678E+02	0.2471E-01	0.1746E+01	0.1000E-01
0.1670E+03	0.6177E-01	0.4364E+01	0.2500E-01
0.3336E+03	0.1235E+00	0.8729E+01	0.5000E-01
0.4845E+03	0.1822E+00	0.1309E+02	0.7500E-01
0.6183E+03	0.2369E+00	0.1746E+02	0.1000E+00
0.1197E+04	0.5181E+00	0.4364E+02	0.2500E+00
0.1691E+04	0.8837E+00	0.8362E+02	0.5000E+00
0.1798E+04	0.1131E+01	0.1163E+03	0.7200E+00
0.1919E+04	0.2247E+01	0.2420E+03	0.1800E+01
0.1962E+04	0.4061E+01	0.2954E+03	0.3600E+01

Piers
Static Axial Capacity
9-ft CIDH with 10-ft Casing

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SHAFT for Windows, Version 2017.8.4

Serial Number : 253582343

VERTICALLY LOADED DRILLED SHAFT ANALYSIS
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Path to file locations : C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Pile Capacity\SHAFT Final Rev2\
Name of input data file : Piers_9ft_Final_Rev.sf8d
Name of output file : Piers_9ft_Final_Rev.sf8o
Name of plot output file : Piers_9ft_Final_Rev.sf8p
Name of runtime file : Piers_9ft_Final_Rev.sf8r

Time and Date of Analysis

Date: May 18, 2020 Time: 09:48:22

Camino Del Mar Bridge Replacement - Phase 0

PROPOSED DEPTH = 200.0 FT

NUMBER OF LAYERS = 8

WATER TABLE DEPTH = 0.0 FT.

SOIL INFORMATION

LAYER NO 1----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.100E+01
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.000E+00

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.690E+00
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.120E+02

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 2----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA = 0.550E+00
END BEARING COEFFICIENT-Nc = 0.760E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.110E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.120E+02

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA = 0.550E+00
END BEARING COEFFICIENT-Nc = 0.853E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.110E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.190E+02

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  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 3----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.610E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.280E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.120E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.190E+02

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.470E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.280E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.120E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.350E+02

  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 4----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.700E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.320E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.350E+02

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.410E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.320E+02
```

BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11
DEPTH, FT	= 0.650E+02
LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.500E+00

LAYER NO 5----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00
END BEARING COEFFICIENT-Nc	= 0.900E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.750E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT	= 0.115E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11
DEPTH, FT	= 0.650E+02

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00
END BEARING COEFFICIENT-Nc	= 0.900E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.750E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT	= 0.115E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11
DEPTH, FT	= 0.820E+02
LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.500E+00

LAYER NO 6----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD	
SKIN FRICTION COEFFICIENT- BETA	= 0.280E+00
INTERNAL FRICTION ANGLE, DEG.	= 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11
DEPTH, FT	= 0.820E+02

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.125E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.122E+03

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 7----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.360E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.130E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.122E+03

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.360E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.130E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.207E+03

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 8----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA = 0.510E+00
END BEARING COEFFICIENT-Nc = 0.900E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+04

```
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.135E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.207E+03


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.510E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.400E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.135E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.255E+03


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS


INPUT DRILLED SHAFT INFORMATION
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 MINIMUM SHAFT DIAMETER    =    9.000  FT.
 MAXIMUM SHAFT DIAMETER    =    9.000  FT.
 RATIO BASE/SHAFT DIAMETER =    0.000  FT.
 ANGLE OF BELL             =    0.000  DEG.
 IGNORED TOP PORTION       =   82.000  FT.
 IGNORED BOTTOM PORTION    =    0.000  FT.
 ELASTIC MODULUS, Ec       = 0.360E+07 LB/SQ IN




COMPUTATION RESULTS
-------------------


- CASE ANALYZED      :     1
```

VARIATION LENGTH : 1
VARIATION DIAMETER : 1

DRILLED SHAFT INFORMATION

DIAMETER OF STEM = 9.000 FT.
DIAMETER OF BASE = 9.000 FT.
END OF STEM TO BASE = 0.000 FT.
ANGLE OF BELL = 0.000 DEG.
IGNORED TOP PORTION = 82.000 FT.
IGNORED BOTTOM PORTION = 0.000 FT.
AREA OF ONE PERCENT STEEL = 91.621 SQ.IN.
ELASTIC MODULUS, Ec = 0.360E+07 LB/SQ IN
VOLUME OF UNDERREAM = 0.000 CU.YDS.
SHAFT LENGTH = 200.000 FT.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
83.0	195.59	18.75	313.08	331.83	13.13	156.54	169.66
84.0	197.95	37.70	313.57	351.28	26.39	156.79	183.18
85.0	200.30	56.84	313.91	370.75	39.79	156.95	196.74
86.0	202.66	76.18	314.11	390.29	53.33	157.05	210.38
87.0	205.02	95.71	314.21	409.92	67.00	157.10	224.10
88.0	207.37	115.43	314.24	429.67	80.80	157.12	237.92
89.0	209.73	135.34	314.24	449.58	94.74	157.12	251.86
90.0	212.08	155.44	314.24	469.68	108.81	157.12	265.93
91.0	214.44	175.72	314.24	489.96	123.01	157.12	280.13
92.0	216.80	196.19	314.24	510.43	137.33	157.12	294.45
93.0	219.15	216.85	314.24	531.09	151.79	157.12	308.91
94.0	221.51	237.68	314.24	551.92	166.38	157.12	323.50

95.0	223.87	258.70	314.24	572.94	181.09	157.12	338.21
96.0	226.22	279.90	314.24	594.14	195.93	157.12	353.05
97.0	228.58	301.28	314.24	615.52	210.89	157.12	368.01
98.0	230.94	322.83	314.24	637.07	225.98	157.12	383.10
99.0	233.29	344.56	314.24	658.80	241.20	157.12	398.32
100.0	235.65	366.47	314.24	680.71	256.53	157.12	413.65
101.0	238.01	388.55	314.24	702.79	271.99	157.12	429.11
102.0	240.36	410.80	314.24	725.04	287.56	157.12	444.68
103.0	242.72	433.23	314.24	747.47	303.26	157.12	460.38
104.0	245.08	455.82	314.24	770.06	319.07	157.12	476.19
105.0	247.43	478.58	323.72	802.30	335.01	161.86	496.86
106.0	249.79	501.51	333.69	835.20	351.06	166.85	517.90
107.0	252.15	524.60	344.17	868.77	367.22	172.08	539.30
108.0	254.50	547.86	355.14	903.00	383.50	177.57	561.07
109.0	256.86	571.28	366.61	937.89	399.90	183.31	583.20
110.0	259.21	594.86	378.58	973.44	416.40	189.29	605.69
111.0	261.57	618.60	391.05	1009.66	433.02	195.53	628.55
112.0	263.93	642.51	404.02	1046.53	449.75	202.01	651.76
113.0	266.28	666.56	417.49	1084.05	466.60	208.74	675.34
114.0	268.64	690.78	429.46	1120.24	483.55	214.73	698.28
115.0	271.00	715.15	439.94	1155.08	500.61	219.97	720.57
116.0	273.35	739.67	448.91	1188.59	517.77	224.46	742.23
117.0	275.71	764.35	456.40	1220.75	535.05	228.20	763.24
118.0	278.07	789.18	462.38	1251.56	552.42	231.19	783.61
119.0	280.42	814.15	466.87	1281.02	569.91	233.43	803.34
120.0	282.78	839.28	469.86	1309.14	587.50	234.93	822.43
121.0	285.14	864.55	471.36	1335.91	605.19	235.68	840.87
122.0	287.49	889.97	471.36	1361.33	622.98	235.68	858.66
123.0	289.85	915.62	471.36	1386.98	640.93	235.68	876.61
124.0	292.21	941.51	471.36	1412.86	659.05	235.68	894.73
125.0	294.56	967.63	471.36	1438.99	677.34	235.68	913.02
126.0	296.92	994.00	471.36	1465.36	695.80	235.68	931.48
127.0	299.28	1020.60	471.36	1491.96	714.42	235.68	950.10
128.0	301.63	1047.44	471.36	1518.80	733.21	235.68	968.89
129.0	303.99	1074.53	471.36	1545.88	752.17	235.68	987.85
130.0	306.35	1101.85	471.36	1573.21	771.29	235.68	1006.97
131.0	308.70	1129.41	471.36	1600.77	790.58	235.68	1026.26
132.0	311.06	1157.21	471.36	1628.56	810.04	235.68	1045.72
133.0	313.41	1185.24	471.36	1656.60	829.67	235.68	1065.35
134.0	315.77	1213.52	471.36	1684.88	849.46	235.68	1085.14
135.0	318.13	1242.04	471.36	1713.39	869.42	235.68	1105.10
136.0	320.48	1270.79	471.36	1742.15	889.55	235.68	1125.23
137.0	322.84	1299.78	471.36	1771.14	909.85	235.68	1145.53
138.0	325.20	1329.02	471.36	1800.37	930.31	235.68	1165.99
139.0	327.55	1358.49	471.36	1829.85	950.94	235.68	1186.62
140.0	329.91	1388.20	471.36	1859.56	971.74	235.68	1207.42
141.0	332.27	1418.15	471.36	1889.51	992.70	235.68	1228.38
142.0	334.62	1448.33	471.36	1919.69	1013.83	235.68	1249.51

143.0	336.98	1478.76	471.36	1950.12	1035.13	235.68	1270.81
144.0	339.34	1509.43	471.36	1980.79	1056.60	235.68	1292.28
145.0	341.69	1540.33	471.36	2011.69	1078.23	235.68	1313.91
146.0	344.05	1571.48	471.36	2042.84	1100.03	235.68	1335.71
147.0	346.41	1602.86	471.36	2074.22	1122.00	235.68	1357.68
148.0	348.76	1634.48	471.36	2105.84	1144.14	235.68	1379.82
149.0	351.12	1666.34	471.36	2137.70	1166.44	235.68	1402.12
150.0	353.48	1698.44	471.36	2169.80	1188.91	235.68	1424.59
151.0	355.83	1730.78	471.36	2202.14	1211.55	235.68	1447.23
152.0	358.19	1763.36	471.36	2234.72	1234.35	235.68	1470.03
153.0	360.54	1796.18	471.36	2267.53	1257.32	235.68	1493.00
154.0	362.90	1829.23	471.36	2300.59	1280.46	235.68	1516.14
155.0	365.26	1862.53	471.36	2333.88	1303.77	235.68	1539.45
156.0	367.61	1896.06	471.36	2367.42	1327.24	235.68	1562.92
157.0	369.97	1929.83	471.36	2401.19	1350.88	235.68	1586.56
158.0	372.33	1963.84	471.36	2435.20	1374.69	235.68	1610.37
159.0	374.68	1998.09	471.36	2469.45	1398.67	235.68	1634.34
160.0	377.04	2032.58	471.36	2503.94	1422.81	235.68	1658.49
161.0	379.40	2067.31	471.36	2538.67	1447.12	235.68	1682.80
162.0	381.75	2102.28	471.36	2573.64	1471.59	235.68	1707.27
163.0	384.11	2137.48	471.36	2608.84	1496.24	235.68	1731.92
164.0	386.47	2172.93	471.36	2644.29	1521.05	235.68	1756.73
165.0	388.82	2208.61	471.36	2679.97	1546.03	235.68	1781.71
166.0	391.18	2244.54	471.36	2715.89	1571.17	235.68	1806.85
167.0	393.54	2280.70	471.36	2752.06	1596.49	235.68	1832.17
168.0	395.89	2317.10	471.36	2788.46	1621.97	235.68	1857.65
169.0	398.25	2353.74	471.36	2825.10	1647.62	235.68	1883.30
170.0	400.61	2390.62	471.36	2861.98	1673.43	235.68	1909.11
171.0	402.96	2427.73	471.36	2899.09	1699.41	235.68	1935.09
172.0	405.32	2465.09	471.36	2936.45	1725.56	235.68	1961.24
173.0	407.67	2502.69	471.36	2974.05	1751.88	235.68	1987.56
174.0	410.03	2540.52	471.36	3011.88	1778.36	235.68	2014.04
175.0	412.39	2578.59	471.36	3049.95	1805.02	235.68	2040.70
176.0	414.74	2616.91	471.36	3088.27	1831.84	235.68	2067.51
177.0	417.10	2655.46	471.36	3126.82	1858.82	235.68	2094.50
178.0	419.46	2694.25	471.36	3165.61	1885.97	235.68	2121.65
179.0	421.81	2733.28	471.36	3204.64	1913.29	235.68	2148.97
180.0	424.17	2772.55	471.36	3243.91	1940.78	235.68	2176.46
181.0	426.53	2812.05	471.36	3283.41	1968.44	235.68	2204.12
182.0	428.88	2851.80	471.36	3323.16	1996.26	235.68	2231.94
183.0	431.24	2891.78	471.36	3363.14	2024.25	235.68	2259.93
184.0	433.60	2932.01	471.36	3403.37	2052.41	235.68	2288.09
185.0	435.95	2972.47	471.36	3443.83	2080.73	235.68	2316.41
186.0	438.31	3013.17	471.36	3484.53	2109.22	235.68	2344.90
187.0	440.67	3054.11	471.36	3525.47	2137.88	235.68	2373.56
188.0	443.02	3095.29	471.36	3566.65	2166.71	235.68	2402.39
189.0	445.38	3136.71	471.36	3608.07	2195.70	235.68	2431.38
190.0	447.73	3178.37	487.55	3665.92	2224.86	243.78	2468.64

191.0	450.09	3220.27	504.60	3724.87	2254.19	252.30	2506.49
192.0	452.45	3262.40	522.50	3784.90	2283.68	261.25	2544.93
193.0	454.80	3304.78	541.25	3846.02	2313.34	270.62	2583.97
194.0	457.16	3347.39	560.85	3908.24	2343.17	280.42	2623.60
195.0	459.52	3390.24	581.30	3971.55	2373.17	290.65	2663.82
196.0	461.87	3433.33	602.61	4035.95	2403.33	301.31	2704.64
197.0	464.23	3476.67	624.77	4101.44	2433.67	312.39	2746.05
198.0	466.59	3520.23	647.78	4168.02	2464.16	323.89	2788.06
199.0	468.94	3564.04	668.24	4232.28	2494.83	334.12	2828.95
200.0	471.30	3608.09	686.14	4294.23	2525.66	343.07	2868.73

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1372E+00	0.2455E-04	0.5019E-02	0.1000E-04
0.6862E+00	0.1228E-03	0.2509E-01	0.5000E-04
0.1372E+01	0.2455E-03	0.5019E-01	0.1000E-03
0.6884E+02	0.1230E-01	0.2509E+01	0.5000E-02
0.1033E+03	0.1844E-01	0.3764E+01	0.7500E-02
0.1377E+03	0.2459E-01	0.5019E+01	0.1000E-01
0.3443E+03	0.6149E-01	0.1255E+02	0.2500E-01
0.6886E+03	0.1230E+00	0.2509E+02	0.5000E-01
0.1029E+04	0.1842E+00	0.3764E+02	0.7500E-01
0.1336E+04	0.2428E+00	0.5019E+02	0.1000E+00
0.2536E+04	0.5256E+00	0.1255E+03	0.2500E+00
0.3356E+04	0.8706E+00	0.2509E+03	0.5000E+00
0.3837E+04	0.1510E+01	0.3842E+03	0.1080E+01
0.4041E+04	0.3160E+01	0.5935E+03	0.2700E+01
0.4102E+04	0.5869E+01	0.6656E+03	0.5400E+01

RESULT FROM UPPER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1957E+00	0.3054E-04	0.7497E-02	0.1000E-04
0.9786E+00	0.1527E-03	0.3748E-01	0.5000E-04
0.1957E+01	0.3054E-03	0.7497E-01	0.1000E-03
0.9831E+02	0.1531E-01	0.3748E+01	0.5000E-02
0.1475E+03	0.2297E-01	0.5623E+01	0.7500E-02

0.1967E+03	0.3063E-01	0.7497E+01	0.1000E-01
0.4917E+03	0.7658E-01	0.1874E+02	0.2500E-01
0.9833E+03	0.1532E+00	0.3748E+02	0.5000E-01
0.1455E+04	0.2284E+00	0.5623E+02	0.7500E-01
0.1867E+04	0.2985E+00	0.7497E+02	0.1000E+00
0.3271E+04	0.6074E+00	0.1874E+03	0.2500E+00
0.3907E+04	0.9359E+00	0.3748E+03	0.5000E+00
0.4113E+04	0.1544E+01	0.5146E+03	0.1080E+01
0.4255E+04	0.3185E+01	0.6587E+03	0.2700E+01
0.4279E+04	0.5889E+01	0.6827E+03	0.5400E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.8432E-01	0.1902E-04	0.2541E-02	0.1000E-04
0.4216E+00	0.9511E-04	0.1271E-01	0.5000E-04
0.8432E+00	0.1902E-03	0.2541E-01	0.1000E-03
0.4224E+02	0.9517E-02	0.1271E+01	0.5000E-02
0.6337E+02	0.1428E-01	0.1906E+01	0.7500E-02
0.8450E+02	0.1904E-01	0.2541E+01	0.1000E-01
0.2113E+03	0.4760E-01	0.6353E+01	0.2500E-01
0.4226E+03	0.9520E-01	0.1271E+02	0.5000E-01
0.6339E+03	0.1428E+00	0.1906E+02	0.7500E-01
0.8365E+03	0.1897E+00	0.2541E+02	0.1000E+00
0.1782E+04	0.4425E+00	0.6353E+02	0.2500E+00
0.2782E+04	0.8032E+00	0.1271E+03	0.5000E+00
0.3558E+04	0.1475E+01	0.2539E+03	0.1080E+01
0.3826E+04	0.3134E+01	0.5283E+03	0.2700E+01
0.3922E+04	0.5849E+01	0.6450E+03	0.5400E+01

Piers
Seismic Axial Capacity
9-ft CIDH with 10-ft Casing

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SHAFT for Windows, Version 2017.8.4

Serial Number : 253582343

VERTICALLY LOADED DRILLED SHAFT ANALYSIS
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Path to file locations : C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Pile Capacity\SHAFT Final Rev2\
Name of input data file : Piers_9ft_Seismic_Final_Rev.sf8d
Name of output file : Piers_9ft_Seismic_Final_Rev.sf8o
Name of plot output file : Piers_9ft_Seismic_Final_Rev.sf8p
Name of runtime file : Piers_9ft_Seismic_Final_Rev.sf8r

Time and Date of Analysis

Date: May 18, 2020 Time: 11:52:53

Camino Del Mar Bridge Replacement - Phase 0

PROPOSED DEPTH = 200.0 FT

NUMBER OF LAYERS = 8

WATER TABLE DEPTH = 0.0 FT.

SOIL INFORMATION

LAYER NO 1----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.600E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.000E+00	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.760E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.120E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 2----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.760E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.110E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.120E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.853E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.110E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	

DEPTH, FT	= 0.190E+02	
LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 3----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.853E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.450E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.190E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.450E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.350E+02	
LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 4----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.700E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.350E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.700E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.650E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 5----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.750E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.115E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.650E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.750E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.115E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.820E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 6----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD

```
  SKIN FRICTION COEFFICIENT- BETA                    = 0.280E+00
  INTERNAL FRICTION ANGLE, DEG.                      = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.820E+02

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                    = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                      = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.122E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)             = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)            = 0.100E+01


LAYER NO 7----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                    = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                      = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.122E+03

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                    = 0.250E+00
  INTERNAL FRICTION ANGLE, DEG.                      = 0.360E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST      = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                         = 0.130E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT           = 0.100E+11
  DEPTH, FT                                          = 0.207E+03

  LRFD RESISTANCE FACTOR (SIDE FRICTION)             = 0.100E+01
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)            = 0.100E+01


LAYER NO 8----CLAY
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AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.510E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+04	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.135E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.207E+03	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.510E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+04	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.135E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.255E+03	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01

(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS

INPUT DRILLED SHAFT INFORMATION

MINIMUM SHAFT DIAMETER	= 9.000	FT.
MAXIMUM SHAFT DIAMETER	= 9.000	FT.
RATIO BASE/SHAFT DIAMETER	= 0.000	FT.
ANGLE OF BELL	= 0.000	DEG.
IGNORED TOP PORTION	= 82.000	FT.
IGNORED BOTTOM PORTION	= 0.000	FT.
ELASTIC MODULUS, Ec	= 0.360E+07	LB/SQ IN

COMPUTATION RESULTS

- CASE ANALYZED : 1
  VARIATION LENGTH : 1
  VARIATION DIAMETER : 1

DRILLED SHAFT INFORMATION

DIAMETER OF STEM	= 9.000	FT.
DIAMETER OF BASE	= 9.000	FT.
END OF STEM TO BASE	= 0.000	FT.
ANGLE OF BELL	= 0.000	DEG.
IGNORED TOP PORTION	= 82.000	FT.
IGNORED BOTTOM PORTION	= 0.000	FT.
AREA OF ONE PERCENT STEEL	= 91.621	SQ.IN.
ELASTIC MODULUS, Ec	= 0.360E+07	LB/SQ IN
VOLUME OF UNDERREAM	= 0.000	CU.YDS.
SHAFT LENGTH	= 200.000	FT.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
83.0	195.59	18.75	313.08	331.83	18.75	313.08	331.83
84.0	197.95	37.70	313.57	351.28	37.70	313.57	351.28
85.0	200.30	56.84	313.91	370.75	56.84	313.91	370.75
86.0	202.66	76.18	314.11	390.29	76.18	314.11	390.29
87.0	205.02	95.71	314.21	409.92	95.71	314.21	409.92
88.0	207.37	115.43	314.24	429.67	115.43	314.24	429.67

89.0	209.73	135.34	314.24	449.58	135.34	314.24	449.58
90.0	212.08	155.44	314.24	469.68	155.44	314.24	469.68
91.0	214.44	175.72	314.24	489.96	175.72	314.24	489.96
92.0	216.80	196.19	314.24	510.43	196.19	314.24	510.43
93.0	219.15	216.85	314.24	531.09	216.85	314.24	531.09
94.0	221.51	237.68	314.24	551.92	237.68	314.24	551.92
95.0	223.87	258.70	314.24	572.94	258.70	314.24	572.94
96.0	226.22	279.90	314.24	594.14	279.90	314.24	594.14
97.0	228.58	301.28	314.24	615.52	301.28	314.24	615.52
98.0	230.94	322.83	314.24	637.07	322.83	314.24	637.07
99.0	233.29	344.56	314.24	658.80	344.56	314.24	658.80
100.0	235.65	366.47	314.24	680.71	366.47	314.24	680.71
101.0	238.01	388.55	314.24	702.79	388.55	314.24	702.79
102.0	240.36	410.80	314.24	725.04	410.80	314.24	725.04
103.0	242.72	433.23	314.24	747.47	433.23	314.24	747.47
104.0	245.08	455.82	314.24	770.06	455.82	314.24	770.06
105.0	247.43	478.58	323.72	802.30	478.58	323.72	802.30
106.0	249.79	501.51	333.69	835.20	501.51	333.69	835.20
107.0	252.15	524.60	344.17	868.77	524.60	344.17	868.77
108.0	254.50	547.86	355.14	903.00	547.86	355.14	903.00
109.0	256.86	571.28	366.61	937.89	571.28	366.61	937.89
110.0	259.21	594.86	378.58	973.44	594.86	378.58	973.44
111.0	261.57	618.60	391.05	1009.66	618.60	391.05	1009.66
112.0	263.93	642.51	404.02	1046.53	642.51	404.02	1046.53
113.0	266.28	666.56	417.49	1084.05	666.56	417.49	1084.05
114.0	268.64	690.78	429.46	1120.24	690.78	429.46	1120.24
115.0	271.00	715.15	439.94	1155.08	715.15	439.94	1155.08
116.0	273.35	739.67	448.91	1188.59	739.67	448.91	1188.59
117.0	275.71	764.35	456.40	1220.75	764.35	456.40	1220.75
118.0	278.07	789.18	462.38	1251.56	789.18	462.38	1251.56
119.0	280.42	814.15	466.87	1281.02	814.15	466.87	1281.02
120.0	282.78	839.28	469.86	1309.14	839.28	469.86	1309.14
121.0	285.14	864.55	471.36	1335.91	864.55	471.36	1335.91
122.0	287.49	889.97	471.36	1361.33	889.97	471.36	1361.33
123.0	289.85	915.62	471.36	1386.98	915.62	471.36	1386.98
124.0	292.21	941.51	471.36	1412.86	941.51	471.36	1412.86
125.0	294.56	967.63	471.36	1438.99	967.63	471.36	1438.99
126.0	296.92	994.00	471.36	1465.36	994.00	471.36	1465.36
127.0	299.28	1020.60	471.36	1491.96	1020.60	471.36	1491.96
128.0	301.63	1047.44	471.36	1518.80	1047.44	471.36	1518.80
129.0	303.99	1074.53	471.36	1545.88	1074.53	471.36	1545.88
130.0	306.35	1101.85	471.36	1573.21	1101.85	471.36	1573.21
131.0	308.70	1129.41	471.36	1600.77	1129.41	471.36	1600.77
132.0	311.06	1157.21	471.36	1628.56	1157.21	471.36	1628.56
133.0	313.41	1185.24	471.36	1656.60	1185.24	471.36	1656.60
134.0	315.77	1213.52	471.36	1684.88	1213.52	471.36	1684.88
135.0	318.13	1242.04	471.36	1713.39	1242.04	471.36	1713.39
136.0	320.48	1270.79	471.36	1742.15	1270.79	471.36	1742.15

137.0	322.84	1299.78	471.36	1771.14	1299.78	471.36	1771.14
138.0	325.20	1329.02	471.36	1800.37	1329.02	471.36	1800.37
139.0	327.55	1358.49	471.36	1829.85	1358.49	471.36	1829.85
140.0	329.91	1388.20	471.36	1859.56	1388.20	471.36	1859.56
141.0	332.27	1418.15	471.36	1889.51	1418.15	471.36	1889.51
142.0	334.62	1448.33	471.36	1919.69	1448.33	471.36	1919.69
143.0	336.98	1478.76	471.36	1950.12	1478.76	471.36	1950.12
144.0	339.34	1509.43	471.36	1980.79	1509.43	471.36	1980.79
145.0	341.69	1540.33	471.36	2011.69	1540.33	471.36	2011.69
146.0	344.05	1571.48	471.36	2042.84	1571.48	471.36	2042.84
147.0	346.41	1602.86	471.36	2074.22	1602.86	471.36	2074.22
148.0	348.76	1634.48	471.36	2105.84	1634.48	471.36	2105.84
149.0	351.12	1666.34	471.36	2137.70	1666.34	471.36	2137.70
150.0	353.48	1698.44	471.36	2169.80	1698.44	471.36	2169.80
151.0	355.83	1730.78	471.36	2202.14	1730.78	471.36	2202.14
152.0	358.19	1763.36	471.36	2234.72	1763.36	471.36	2234.72
153.0	360.54	1796.18	471.36	2267.53	1796.18	471.36	2267.53
154.0	362.90	1829.23	471.36	2300.59	1829.23	471.36	2300.59
155.0	365.26	1862.53	471.36	2333.88	1862.53	471.36	2333.88
156.0	367.61	1896.06	471.36	2367.42	1896.06	471.36	2367.42
157.0	369.97	1929.83	471.36	2401.19	1929.83	471.36	2401.19
158.0	372.33	1963.84	471.36	2435.20	1963.84	471.36	2435.20
159.0	374.68	1998.09	471.36	2469.45	1998.09	471.36	2469.45
160.0	377.04	2032.58	471.36	2503.94	2032.58	471.36	2503.94
161.0	379.40	2067.31	471.36	2538.67	2067.31	471.36	2538.67
162.0	381.75	2102.28	471.36	2573.64	2102.28	471.36	2573.64
163.0	384.11	2137.48	471.36	2608.84	2137.48	471.36	2608.84
164.0	386.47	2172.93	471.36	2644.29	2172.93	471.36	2644.29
165.0	388.82	2208.61	471.36	2679.97	2208.61	471.36	2679.97
166.0	391.18	2244.54	471.36	2715.89	2244.54	471.36	2715.89
167.0	393.54	2280.70	471.36	2752.06	2280.70	471.36	2752.06
168.0	395.89	2317.10	471.36	2788.46	2317.10	471.36	2788.46
169.0	398.25	2353.74	471.36	2825.10	2353.74	471.36	2825.10
170.0	400.61	2390.62	471.36	2861.98	2390.62	471.36	2861.98
171.0	402.96	2427.73	471.36	2899.09	2427.73	471.36	2899.09
172.0	405.32	2465.09	471.36	2936.45	2465.09	471.36	2936.45
173.0	407.67	2502.69	471.36	2974.05	2502.69	471.36	2974.05
174.0	410.03	2540.52	471.36	3011.88	2540.52	471.36	3011.88
175.0	412.39	2578.59	471.36	3049.95	2578.59	471.36	3049.95
176.0	414.74	2616.91	471.36	3088.27	2616.91	471.36	3088.27
177.0	417.10	2655.46	471.36	3126.82	2655.46	471.36	3126.82
178.0	419.46	2694.25	471.36	3165.61	2694.25	471.36	3165.61
179.0	421.81	2733.28	471.36	3204.64	2733.28	471.36	3204.64
180.0	424.17	2772.55	471.36	3243.91	2772.55	471.36	3243.91
181.0	426.53	2812.05	471.36	3283.41	2812.05	471.36	3283.41
182.0	428.88	2851.80	471.36	3323.16	2851.80	471.36	3323.16
183.0	431.24	2891.78	471.36	3363.14	2891.78	471.36	3363.14
184.0	433.60	2932.01	471.36	3403.37	2932.01	471.36	3403.37

185.0	435.95	2972.47	471.36	3443.83	2972.47	471.36	3443.83
186.0	438.31	3013.17	471.36	3484.53	3013.17	471.36	3484.53
187.0	440.67	3054.11	471.36	3525.47	3054.11	471.36	3525.47
188.0	443.02	3095.29	471.36	3566.65	3095.29	471.36	3566.65
189.0	445.38	3136.71	471.36	3608.07	3136.71	471.36	3608.07
190.0	447.73	3178.37	487.55	3665.92	3178.37	487.55	3665.92
191.0	450.09	3220.27	504.60	3724.87	3220.27	504.60	3724.87
192.0	452.45	3262.40	522.50	3784.90	3262.40	522.50	3784.90
193.0	454.80	3304.78	541.25	3846.02	3304.78	541.25	3846.02
194.0	457.16	3347.39	560.85	3908.24	3347.39	560.85	3908.24
195.0	459.52	3390.24	581.30	3971.55	3390.24	581.30	3971.55
196.0	461.87	3433.33	602.61	4035.95	3433.33	602.61	4035.95
197.0	464.23	3476.67	624.77	4101.44	3476.67	624.77	4101.44
198.0	466.59	3520.23	647.78	4168.02	3520.23	647.78	4168.02
199.0	468.94	3564.04	668.24	4232.28	3564.04	668.24	4232.28
200.0	471.30	3608.09	686.14	4294.23	3608.09	686.14	4294.23

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1372E+00	0.2455E-04	0.5019E-02	0.1000E-04
0.6862E+00	0.1228E-03	0.2509E-01	0.5000E-04
0.1372E+01	0.2455E-03	0.5019E-01	0.1000E-03
0.6884E+02	0.1230E-01	0.2509E+01	0.5000E-02
0.1033E+03	0.1844E-01	0.3764E+01	0.7500E-02
0.1377E+03	0.2459E-01	0.5019E+01	0.1000E-01
0.3443E+03	0.6149E-01	0.1255E+02	0.2500E-01
0.6886E+03	0.1230E+00	0.2509E+02	0.5000E-01
0.1029E+04	0.1842E+00	0.3764E+02	0.7500E-01
0.1336E+04	0.2428E+00	0.5019E+02	0.1000E+00
0.2536E+04	0.5256E+00	0.1255E+03	0.2500E+00
0.3356E+04	0.8706E+00	0.2509E+03	0.5000E+00
0.3837E+04	0.1510E+01	0.3842E+03	0.1080E+01
0.4041E+04	0.3160E+01	0.5935E+03	0.2700E+01
0.4102E+04	0.5869E+01	0.6656E+03	0.5400E+01

RESULT FROM UPPER-BOUND LINE

TOP LOAD	TOP MOVEMENT	TIP LOAD	TIP MOVEMENT

TON	IN.	TON	IN.
0.1957E+00	0.3054E-04	0.7497E-02	0.1000E-04
0.9786E+00	0.1527E-03	0.3748E-01	0.5000E-04
0.1957E+01	0.3054E-03	0.7497E-01	0.1000E-03
0.9831E+02	0.1531E-01	0.3748E+01	0.5000E-02
0.1475E+03	0.2297E-01	0.5623E+01	0.7500E-02
0.1967E+03	0.3063E-01	0.7497E+01	0.1000E-01
0.4917E+03	0.7658E-01	0.1874E+02	0.2500E-01
0.9833E+03	0.1532E+00	0.3748E+02	0.5000E-01
0.1455E+04	0.2284E+00	0.5623E+02	0.7500E-01
0.1867E+04	0.2985E+00	0.7497E+02	0.1000E+00
0.3271E+04	0.6074E+00	0.1874E+03	0.2500E+00
0.3907E+04	0.9359E+00	0.3748E+03	0.5000E+00
0.4113E+04	0.1544E+01	0.5146E+03	0.1080E+01
0.4255E+04	0.3185E+01	0.6587E+03	0.2700E+01
0.4279E+04	0.5889E+01	0.6827E+03	0.5400E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.8432E-01	0.1902E-04	0.2541E-02	0.1000E-04
0.4216E+00	0.9511E-04	0.1271E-01	0.5000E-04
0.8432E+00	0.1902E-03	0.2541E-01	0.1000E-03
0.4224E+02	0.9517E-02	0.1271E+01	0.5000E-02
0.6337E+02	0.1428E-01	0.1906E+01	0.7500E-02
0.8450E+02	0.1904E-01	0.2541E+01	0.1000E-01
0.2113E+03	0.4760E-01	0.6353E+01	0.2500E-01
0.4226E+03	0.9520E-01	0.1271E+02	0.5000E-01
0.6339E+03	0.1428E+00	0.1906E+02	0.7500E-01
0.8365E+03	0.1897E+00	0.2541E+02	0.1000E+00
0.1782E+04	0.4425E+00	0.6353E+02	0.2500E+00
0.2782E+04	0.8032E+00	0.1271E+03	0.5000E+00
0.3558E+04	0.1475E+01	0.2539E+03	0.1080E+01
0.3826E+04	0.3134E+01	0.5283E+03	0.2700E+01
0.3922E+04	0.5849E+01	0.6450E+03	0.5400E+01

Piers
Static Axial Capacity
10-ft CIDH with 11-ft Casing

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SHAFT for Windows, Version 2017.8.4

Serial Number : 253582343

VERTICALLY LOADED DRILLED SHAFT ANALYSIS
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Path to file locations : C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Pile Capacity\SHAFT Final Rev2\
Name of input data file : Piers_10ft_Final_Rev.sf8d
Name of output file : Piers_10ft_Final_Rev.sf8o
Name of plot output file : Piers_10ft_Final_Rev.sf8p
Name of runtime file : Piers_10ft_Final_Rev.sf8r

Time and Date of Analysis

Date: May 18, 2020 Time: 09:56:42

Camino Del Mar Bridge Replacement - Phase 0

PROPOSED DEPTH = 200.0 FT

NUMBER OF LAYERS = 8

WATER TABLE DEPTH = 0.0 FT.

SOIL INFORMATION

LAYER NO 1----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.100E+01
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.000E+00

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.690E+00
INTERNAL FRICTION ANGLE, DEG. = 0.280E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.120E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.120E+02

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 2----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA = 0.550E+00
END BEARING COEFFICIENT-Nc = 0.744E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.110E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.120E+02

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA = 0.550E+00
END BEARING COEFFICIENT-Nc = 0.828E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+03
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.110E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.190E+02

```
  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 3----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.610E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.280E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.120E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.190E+02

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.470E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.280E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.120E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.350E+02

  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 4----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.700E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.320E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.350E+02

  AT THE BOTTOM

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.410E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.320E+02
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```
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.650E+02

  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 5----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.750E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.115E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.650E+02


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.750E+03
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.115E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.820E+02


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


LAYER NO 6----SAND

  AT THE TOP

  SIDE FRICTION PROCEDURE, BETA METHOD
  SKIN FRICTION COEFFICIENT- BETA                   = 0.280E+00
  INTERNAL FRICTION ANGLE, DEG.                     = 0.340E+02
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.820E+02
```

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.125E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.122E+03

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 7----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.360E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.130E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.122E+03

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.360E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.130E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.207E+03

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.500E+00

LAYER NO 8----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA = 0.510E+00
END BEARING COEFFICIENT-Nc = 0.900E+01 (*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT = 0.400E+04

```
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.135E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.207E+03


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.510E+00
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.400E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.135E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.255E+03


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.500E+00


(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS


INPUT DRILLED SHAFT INFORMATION
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 MINIMUM SHAFT DIAMETER    =   10.000  FT.
 MAXIMUM SHAFT DIAMETER    =   10.000  FT.
 RATIO BASE/SHAFT DIAMETER =    0.000  FT.
 ANGLE OF BELL             =    0.000  DEG.
 IGNORED TOP PORTION       =   82.000  FT.
 IGNORED BOTTOM PORTION    =    0.000  FT.
 ELASTIC MODULUS, Ec       = 0.360E+07 LB/SQ IN




COMPUTATION RESULTS
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- CASE ANALYZED      :     1
```

VARIATION LENGTH : 1
VARIATION DIAMETER : 1

DRILLED SHAFT INFORMATION

DIAMETER OF STEM = 10.000 FT.
DIAMETER OF BASE = 10.000 FT.
END OF STEM TO BASE = 0.000 FT.
ANGLE OF BELL = 0.000 DEG.
IGNORED TOP PORTION = 82.000 FT.
IGNORED BOTTOM PORTION = 0.000 FT.
AREA OF ONE PERCENT STEEL = 113.112 SQ.IN.
ELASTIC MODULUS, Ec = 0.360E+07 LB/SQ IN
VOLUME OF UNDERREAM = 0.000 CU.YDS.
SHAFT LENGTH = 200.000 FT.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
83.0	241.47	20.84	332.14	352.98	14.59	166.07	180.66
84.0	244.38	41.89	334.83	376.72	29.32	167.42	196.74
85.0	247.29	63.16	337.29	400.45	44.21	168.65	212.86
86.0	250.20	84.65	339.52	424.17	59.25	169.76	229.01
87.0	253.11	106.35	341.51	447.85	74.44	170.75	245.20
88.0	256.01	128.26	343.25	471.50	89.78	171.62	261.40
89.0	258.92	150.38	344.72	495.10	105.26	172.36	277.63
90.0	261.83	172.71	345.93	518.64	120.90	172.97	293.86
91.0	264.74	195.25	346.90	542.15	136.67	173.45	310.12
92.0	267.65	217.99	347.65	565.64	152.59	173.83	326.42
93.0	270.56	240.94	348.21	589.16	168.66	174.11	342.77
94.0	273.47	264.09	348.62	612.71	184.86	174.31	359.17

95.0	276.38	287.45	348.89	636.33	201.21	174.44	375.66
96.0	279.29	311.00	349.05	660.05	217.70	174.52	392.22
97.0	282.20	334.75	349.13	683.88	234.33	174.56	408.89
98.0	285.11	358.70	349.15	707.86	251.09	174.58	425.67
99.0	288.02	382.85	349.15	732.00	267.99	174.58	442.57
100.0	290.93	407.19	349.15	756.34	285.03	174.58	459.61
101.0	293.84	431.72	349.15	780.88	302.21	174.58	476.78
102.0	296.74	456.45	349.15	805.60	319.51	174.58	494.09
103.0	299.65	481.36	358.56	839.92	336.95	179.28	516.23
104.0	302.56	506.47	368.40	874.87	354.53	184.20	538.73
105.0	305.47	531.76	378.70	910.45	372.23	189.35	561.58
106.0	308.38	557.23	389.44	946.67	390.06	194.72	584.78
107.0	311.29	582.89	400.63	983.52	408.02	200.32	608.34
108.0	314.20	608.73	412.27	1021.00	426.11	206.14	632.25
109.0	317.11	634.75	424.36	1059.11	444.33	212.18	656.51
110.0	320.02	660.96	436.89	1097.85	462.67	218.45	681.12
111.0	322.93	687.34	449.87	1137.21	481.14	224.94	706.07
112.0	325.84	713.89	463.30	1177.20	499.73	231.65	731.38
113.0	328.75	740.63	475.39	1216.01	518.44	237.69	756.13
114.0	331.66	767.53	486.13	1253.66	537.27	243.07	780.34
115.0	334.56	794.61	495.53	1290.14	556.23	247.77	803.99
116.0	337.47	821.86	503.59	1325.45	575.30	251.79	827.10
117.0	340.38	849.28	510.30	1359.58	594.49	255.15	849.65
118.0	343.29	876.86	515.67	1392.54	613.81	257.84	871.64
119.0	346.20	904.62	519.70	1424.32	633.23	259.85	893.08
120.0	349.11	932.53	522.39	1454.92	652.77	261.19	913.97
121.0	352.02	960.61	523.73	1484.35	672.43	261.87	934.30
122.0	354.93	988.86	523.73	1512.59	692.20	261.87	954.07
123.0	357.84	1017.35	523.73	1541.09	712.15	261.87	974.01
124.0	360.75	1046.12	523.73	1569.85	732.28	261.87	994.15
125.0	363.66	1075.15	523.73	1598.88	752.60	261.87	1014.47
126.0	366.57	1104.44	523.73	1628.17	773.11	261.87	1034.97
127.0	369.48	1134.00	523.73	1657.73	793.80	261.87	1055.67
128.0	372.39	1163.83	523.73	1687.56	814.68	261.87	1076.54
129.0	375.29	1193.92	523.73	1717.65	835.74	261.87	1097.61
130.0	378.20	1224.27	523.73	1748.01	856.99	261.87	1118.86
131.0	381.11	1254.90	523.73	1778.63	878.43	261.87	1140.29
132.0	384.02	1285.78	523.73	1809.52	900.05	261.87	1161.91
133.0	386.93	1316.94	523.73	1840.67	921.86	261.87	1183.72
134.0	389.84	1348.35	523.73	1872.09	943.85	261.87	1205.71
135.0	392.75	1380.04	523.73	1903.77	966.03	261.87	1227.89
136.0	395.66	1411.99	523.73	1935.72	988.39	261.87	1250.26
137.0	398.57	1444.20	523.73	1967.94	1010.94	261.87	1272.81
138.0	401.48	1476.68	523.73	2000.42	1033.68	261.87	1295.54
139.0	404.39	1509.43	523.73	2033.16	1056.60	261.87	1318.47
140.0	407.30	1542.44	523.73	2066.17	1079.71	261.87	1341.57
141.0	410.21	1575.72	523.73	2099.45	1103.00	261.87	1364.87
142.0	413.11	1609.26	523.73	2132.99	1126.48	261.87	1388.35

143.0	416.02	1643.07	523.73	2166.80	1150.15	261.87	1412.01
144.0	418.93	1677.14	523.73	2200.87	1174.00	261.87	1435.87
145.0	421.84	1711.48	523.73	2235.21	1198.04	261.87	1459.90
146.0	424.75	1746.09	523.73	2269.82	1222.26	261.87	1484.13
147.0	427.66	1780.96	523.73	2304.69	1246.67	261.87	1508.53
148.0	430.57	1816.09	523.73	2339.82	1271.26	261.87	1533.13
149.0	433.48	1851.49	523.73	2375.22	1296.04	261.87	1557.91
150.0	436.39	1887.16	523.73	2410.89	1321.01	261.87	1582.88
151.0	439.30	1923.09	523.73	2446.82	1346.16	261.87	1608.03
152.0	442.21	1959.29	523.73	2483.02	1371.50	261.87	1633.37
153.0	445.12	1995.75	523.73	2519.48	1397.03	261.87	1658.89
154.0	448.03	2032.48	523.73	2556.21	1422.73	261.87	1684.60
155.0	450.94	2069.47	523.73	2593.20	1448.63	261.87	1710.50
156.0	453.84	2106.73	523.73	2630.46	1474.71	261.87	1736.58
157.0	456.75	2144.26	523.73	2667.99	1500.98	261.87	1762.85
158.0	459.66	2182.05	523.73	2705.78	1527.43	261.87	1789.30
159.0	462.57	2220.10	523.73	2743.84	1554.07	261.87	1815.94
160.0	465.48	2258.42	523.73	2782.16	1580.90	261.87	1842.76
161.0	468.39	2297.01	523.73	2820.74	1607.91	261.87	1869.77
162.0	471.30	2335.86	523.73	2859.60	1635.10	261.87	1896.97
163.0	474.21	2374.98	523.73	2898.71	1662.49	261.87	1924.35
164.0	477.12	2414.36	523.73	2938.10	1690.06	261.87	1951.92
165.0	480.03	2454.01	523.73	2977.75	1717.81	261.87	1979.68
166.0	482.94	2493.93	523.73	3017.66	1745.75	261.87	2007.62
167.0	485.85	2534.11	523.73	3057.84	1773.88	261.87	2035.74
168.0	488.76	2574.55	523.73	3098.29	1802.19	261.87	2064.05
169.0	491.66	2615.26	523.73	3139.00	1830.69	261.87	2092.55
170.0	494.57	2656.24	523.73	3179.97	1859.37	261.87	2121.23
171.0	497.48	2697.48	523.73	3221.21	1888.24	261.87	2150.10
172.0	500.39	2738.99	523.73	3262.72	1917.29	261.87	2179.16
173.0	503.30	2780.76	523.73	3304.50	1946.53	261.87	2208.40
174.0	506.21	2822.80	523.73	3346.53	1975.96	261.87	2237.83
175.0	509.12	2865.11	523.73	3388.84	2005.57	261.87	2267.44
176.0	512.03	2907.67	523.73	3431.41	2035.37	261.87	2297.24
177.0	514.94	2950.51	523.73	3474.24	2065.36	261.87	2327.22
178.0	517.85	2993.61	523.73	3517.34	2095.53	261.87	2357.39
179.0	520.76	3036.98	523.73	3560.71	2125.88	261.87	2387.75
180.0	523.67	3080.61	523.73	3604.34	2156.42	261.87	2418.29
181.0	526.58	3124.50	523.73	3648.24	2187.15	261.87	2449.02
182.0	529.49	3168.67	523.73	3692.40	2218.07	261.87	2479.93
183.0	532.39	3213.09	523.73	3736.83	2249.17	261.87	2511.03
184.0	535.30	3257.79	523.73	3781.52	2280.45	261.87	2542.32
185.0	538.21	3302.75	523.73	3826.48	2311.92	261.87	2573.79
186.0	541.12	3347.97	523.73	3871.70	2343.58	261.87	2605.45
187.0	544.03	3393.46	523.73	3917.19	2375.42	261.87	2637.29
188.0	546.94	3439.22	542.53	3981.74	2407.45	271.26	2678.71
189.0	549.85	3485.24	562.22	4047.45	2439.67	281.11	2720.77
190.0	552.76	3531.52	582.80	4114.32	2472.07	291.40	2763.47

191.0	555.67	3578.07	604.28	4182.36	2504.65	302.14	2806.79
192.0	558.58	3624.89	626.66	4251.55	2537.42	313.33	2850.75
193.0	561.49	3671.97	649.93	4321.90	2570.38	324.96	2895.35
194.0	564.40	3719.32	674.09	4393.41	2603.53	337.05	2940.57
195.0	567.31	3766.94	699.15	4466.09	2636.86	349.58	2986.43
196.0	570.21	3814.82	725.10	4539.92	2670.37	362.55	3032.92
197.0	573.12	3862.96	751.95	4614.92	2704.07	375.98	3080.05
198.0	576.03	3911.37	776.12	4687.49	2737.96	388.06	3126.02
199.0	578.94	3960.05	797.60	4757.65	2772.03	398.80	3170.83
200.0	581.85	4008.99	816.39	4825.38	2806.29	408.20	3214.49

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1337E+00	0.2156E-04	0.5375E-02	0.1000E-04
0.6687E+00	0.1078E-03	0.2687E-01	0.5000E-04
0.1337E+01	0.2156E-03	0.5375E-01	0.1000E-03
0.6704E+02	0.1079E-01	0.2687E+01	0.5000E-02
0.1006E+03	0.1619E-01	0.4031E+01	0.7500E-02
0.1341E+03	0.2159E-01	0.5375E+01	0.1000E-01
0.3353E+03	0.5398E-01	0.1344E+02	0.2500E-01
0.6706E+03	0.1080E+00	0.2687E+02	0.5000E-01
0.1006E+04	0.1620E+00	0.4031E+02	0.7500E-01
0.1327E+04	0.2151E+00	0.5375E+02	0.1000E+00
0.2651E+04	0.4837E+00	0.1344E+03	0.2500E+00
0.3577E+04	0.8200E+00	0.2687E+03	0.5000E+00
0.4292E+04	0.1590E+01	0.4572E+03	0.1200E+01
0.4536E+04	0.3419E+01	0.7062E+03	0.3000E+01
0.4610E+04	0.6428E+01	0.7919E+03	0.6000E+01

RESULT FROM UPPER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1890E+00	0.2621E-04	0.8028E-02	0.1000E-04
0.9449E+00	0.1311E-03	0.4014E-01	0.5000E-04
0.1890E+01	0.2621E-03	0.8028E-01	0.1000E-03
0.9484E+02	0.1313E-01	0.4014E+01	0.5000E-02
0.1423E+03	0.1970E-01	0.6021E+01	0.7500E-02

0.1897E+03	0.2626E-01	0.8028E+01	0.1000E-01
0.4743E+03	0.6567E-01	0.2007E+02	0.2500E-01
0.9486E+03	0.1313E+00	0.4014E+02	0.5000E-01
0.1421E+04	0.1969E+00	0.6021E+02	0.7500E-01
0.1852E+04	0.2600E+00	0.8028E+02	0.1000E+00
0.3477E+04	0.5576E+00	0.2007E+03	0.2500E+00
0.4255E+04	0.8841E+00	0.4014E+03	0.5000E+00
0.4611E+04	0.1623E+01	0.6123E+03	0.1200E+01
0.4780E+04	0.3443E+01	0.7837E+03	0.3000E+01
0.4808E+04	0.6446E+01	0.8123E+03	0.6000E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.8292E-01	0.1722E-04	0.2721E-02	0.1000E-04
0.4146E+00	0.8610E-04	0.1361E-01	0.5000E-04
0.8292E+00	0.1722E-03	0.2721E-01	0.1000E-03
0.4152E+02	0.8614E-02	0.1361E+01	0.5000E-02
0.6229E+02	0.1292E-01	0.2041E+01	0.7500E-02
0.8306E+02	0.1723E-01	0.2721E+01	0.1000E-01
0.2077E+03	0.4308E-01	0.6803E+01	0.2500E-01
0.4154E+03	0.8616E-01	0.1361E+02	0.5000E-01
0.6231E+03	0.1292E+00	0.2041E+02	0.7500E-01
0.8294E+03	0.1723E+00	0.2721E+02	0.1000E+00
0.1816E+04	0.4093E+00	0.6803E+02	0.2500E+00
0.2878E+04	0.7543E+00	0.1361E+03	0.5000E+00
0.3971E+04	0.1557E+01	0.3021E+03	0.1200E+01
0.4293E+04	0.3396E+01	0.6286E+03	0.3000E+01
0.4408E+04	0.6410E+01	0.7674E+03	0.6000E+01

Piers
Seismic Axial Capacity
10-ft CIDH with 11-ft Casing

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SHAFT for Windows, Version 2017.8.4

Serial Number : 253582343

VERTICALLY LOADED DRILLED SHAFT ANALYSIS
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Path to file locations : C:\Users\JBonfiglio\OneDrive - Kleinfelder\Desktop\Camino Del Mar Desktop\Pile Capacity\SHAFT Final Rev2\
Name of input data file : Piers_10ft_Seismic_rev2.sf8d
Name of output file : Piers_10ft_Seismic_rev2.sf8o
Name of plot output file : Piers_10ft_Seismic_rev2.sf8p
Name of runtime file : Piers_10ft_Seismic_rev2.sf8r

Time and Date of Analysis

Date: May 18, 2020 Time: 11:57:48

Camino Del Mar Bridge Replacement - Phase 0

PROPOSED DEPTH = 200.0 FT

NUMBER OF LAYERS = 8

WATER TABLE DEPTH = 0.0 FT.

SOIL INFORMATION

LAYER NO 1----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.600E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.000E+00	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.744E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.120E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 2----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.744E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.110E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.120E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.828E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.110E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	

DEPTH, FT	= 0.190E+02	
LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 3----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.828E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.450E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.190E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.450E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.120E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.350E+02	
LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 4----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.700E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.350E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.700E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.650E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 5----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.750E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.115E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.650E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.750E+03	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.115E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.820E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01	
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01	

LAYER NO 6----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD

SKIN FRICTION COEFFICIENT- BETA = 0.280E+00
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.125E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.820E+02

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.340E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.125E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.122E+03

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.100E+01
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.100E+01

LAYER NO 7----SAND

AT THE TOP

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.360E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.130E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.122E+03

AT THE BOTTOM

SIDE FRICTION PROCEDURE, BETA METHOD
SKIN FRICTION COEFFICIENT- BETA = 0.250E+00
INTERNAL FRICTION ANGLE, DEG. = 0.360E+02
BLOWS PER FOOT FROM STANDARD PENETRATION TEST = 0.000E+00
SOIL UNIT WEIGHT, LB/CU FT = 0.130E+03
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT = 0.100E+11
DEPTH, FT = 0.207E+03

LRFD RESISTANCE FACTOR (SIDE FRICTION) = 0.100E+01
LRFD RESISTANCE FACTOR (TIP RESISTANCE) = 0.100E+01

LAYER NO 8----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.510E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+04	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.135E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.207E+03	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.510E+00	
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.400E+04	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.135E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.255E+03	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.100E+01
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E+01

(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS

INPUT DRILLED SHAFT INFORMATION

MINIMUM SHAFT DIAMETER	= 10.000	FT.
MAXIMUM SHAFT DIAMETER	= 10.000	FT.
RATIO BASE/SHAFT DIAMETER	= 0.000	FT.
ANGLE OF BELL	= 0.000	DEG.
IGNORED TOP PORTION	= 82.000	FT.
IGNORED BOTTOM PORTION	= 0.000	FT.
ELASTIC MODULUS, Ec	= 0.360E+07	LB/SQ IN

COMPUTATION RESULTS

- CASE ANALYZED : 1
  VARIATION LENGTH : 1
  VARIATION DIAMETER : 1

DRILLED SHAFT INFORMATION

 DIAMETER OF STEM = 10.000 FT.
 DIAMETER OF BASE = 10.000 FT.
 END OF STEM TO BASE = 0.000 FT.
 ANGLE OF BELL = 0.000 DEG.
 IGNORED TOP PORTION = 82.000 FT.
 IGNORED BOTTOM PORTION = 0.000 FT.
 AREA OF ONE PERCENT STEEL = 113.112 SQ.IN.
 ELASTIC MODULUS, Ec = 0.360E+07 LB/SQ IN
 VOLUME OF UNDERREAM = 0.000 CU.YDS.
 SHAFT LENGTH = 200.000 FT.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR
TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
83.0	241.47	20.84	332.14	352.98	20.84	332.14	352.98
84.0	244.38	41.89	334.83	376.72	41.89	334.83	376.72
85.0	247.29	63.16	337.29	400.45	63.16	337.29	400.45
86.0	250.20	84.65	339.52	424.17	84.65	339.52	424.17
87.0	253.11	106.35	341.51	447.85	106.35	341.51	447.85
88.0	256.01	128.26	343.25	471.50	128.26	343.25	471.50

89.0	258.92	150.38	344.72	495.10	150.38	344.72	495.10
90.0	261.83	172.71	345.93	518.64	172.71	345.93	518.64
91.0	264.74	195.25	346.90	542.15	195.25	346.90	542.15
92.0	267.65	217.99	347.65	565.64	217.99	347.65	565.64
93.0	270.56	240.94	348.21	589.16	240.94	348.21	589.16
94.0	273.47	264.09	348.62	612.71	264.09	348.62	612.71
95.0	276.38	287.45	348.89	636.33	287.45	348.89	636.33
96.0	279.29	311.00	349.05	660.05	311.00	349.05	660.05
97.0	282.20	334.75	349.13	683.88	334.75	349.13	683.88
98.0	285.11	358.70	349.15	707.86	358.70	349.15	707.86
99.0	288.02	382.85	349.15	732.00	382.85	349.15	732.00
100.0	290.93	407.19	349.15	756.34	407.19	349.15	756.34
101.0	293.84	431.72	349.15	780.88	431.72	349.15	780.88
102.0	296.74	456.45	349.15	805.60	456.45	349.15	805.60
103.0	299.65	481.36	358.56	839.92	481.36	358.56	839.92
104.0	302.56	506.47	368.40	874.87	506.47	368.40	874.87
105.0	305.47	531.76	378.70	910.45	531.76	378.70	910.45
106.0	308.38	557.23	389.44	946.67	557.23	389.44	946.67
107.0	311.29	582.89	400.63	983.52	582.89	400.63	983.52
108.0	314.20	608.73	412.27	1021.00	608.73	412.27	1021.00
109.0	317.11	634.75	424.36	1059.11	634.75	424.36	1059.11
110.0	320.02	660.96	436.89	1097.85	660.96	436.89	1097.85
111.0	322.93	687.34	449.87	1137.21	687.34	449.87	1137.21
112.0	325.84	713.89	463.30	1177.20	713.89	463.30	1177.20
113.0	328.75	740.63	475.39	1216.01	740.63	475.39	1216.01
114.0	331.66	767.53	486.13	1253.66	767.53	486.13	1253.66
115.0	334.56	794.61	495.53	1290.14	794.61	495.53	1290.14
116.0	337.47	821.86	503.59	1325.45	821.86	503.59	1325.45
117.0	340.38	849.28	510.30	1359.58	849.28	510.30	1359.58
118.0	343.29	876.86	515.67	1392.54	876.86	515.67	1392.54
119.0	346.20	904.62	519.70	1424.32	904.62	519.70	1424.32
120.0	349.11	932.53	522.39	1454.92	932.53	522.39	1454.92
121.0	352.02	960.61	523.73	1484.35	960.61	523.73	1484.35
122.0	354.93	988.86	523.73	1512.59	988.86	523.73	1512.59
123.0	357.84	1017.35	523.73	1541.09	1017.35	523.73	1541.09
124.0	360.75	1046.12	523.73	1569.85	1046.12	523.73	1569.85
125.0	363.66	1075.15	523.73	1598.88	1075.15	523.73	1598.88
126.0	366.57	1104.44	523.73	1628.17	1104.44	523.73	1628.17
127.0	369.48	1134.00	523.73	1657.73	1134.00	523.73	1657.73
128.0	372.39	1163.83	523.73	1687.56	1163.83	523.73	1687.56
129.0	375.29	1193.92	523.73	1717.65	1193.92	523.73	1717.65
130.0	378.20	1224.27	523.73	1748.01	1224.27	523.73	1748.01
131.0	381.11	1254.90	523.73	1778.63	1254.90	523.73	1778.63
132.0	384.02	1285.78	523.73	1809.52	1285.78	523.73	1809.52
133.0	386.93	1316.94	523.73	1840.67	1316.94	523.73	1840.67
134.0	389.84	1348.35	523.73	1872.09	1348.35	523.73	1872.09
135.0	392.75	1380.04	523.73	1903.77	1380.04	523.73	1903.77
136.0	395.66	1411.99	523.73	1935.72	1411.99	523.73	1935.72

137.0	398.57	1444.20	523.73	1967.94	1444.20	523.73	1967.94
138.0	401.48	1476.68	523.73	2000.42	1476.68	523.73	2000.42
139.0	404.39	1509.43	523.73	2033.16	1509.43	523.73	2033.16
140.0	407.30	1542.44	523.73	2066.17	1542.44	523.73	2066.17
141.0	410.21	1575.72	523.73	2099.45	1575.72	523.73	2099.45
142.0	413.11	1609.26	523.73	2132.99	1609.26	523.73	2132.99
143.0	416.02	1643.07	523.73	2166.80	1643.07	523.73	2166.80
144.0	418.93	1677.14	523.73	2200.87	1677.14	523.73	2200.87
145.0	421.84	1711.48	523.73	2235.21	1711.48	523.73	2235.21
146.0	424.75	1746.09	523.73	2269.82	1746.09	523.73	2269.82
147.0	427.66	1780.96	523.73	2304.69	1780.96	523.73	2304.69
148.0	430.57	1816.09	523.73	2339.82	1816.09	523.73	2339.82
149.0	433.48	1851.49	523.73	2375.22	1851.49	523.73	2375.22
150.0	436.39	1887.16	523.73	2410.89	1887.16	523.73	2410.89
151.0	439.30	1923.09	523.73	2446.82	1923.09	523.73	2446.82
152.0	442.21	1959.29	523.73	2483.02	1959.29	523.73	2483.02
153.0	445.12	1995.75	523.73	2519.48	1995.75	523.73	2519.48
154.0	448.03	2032.48	523.73	2556.21	2032.48	523.73	2556.21
155.0	450.94	2069.47	523.73	2593.20	2069.47	523.73	2593.20
156.0	453.84	2106.73	523.73	2630.46	2106.73	523.73	2630.46
157.0	456.75	2144.26	523.73	2667.99	2144.26	523.73	2667.99
158.0	459.66	2182.05	523.73	2705.78	2182.05	523.73	2705.78
159.0	462.57	2220.10	523.73	2743.84	2220.10	523.73	2743.84
160.0	465.48	2258.42	523.73	2782.16	2258.42	523.73	2782.16
161.0	468.39	2297.01	523.73	2820.74	2297.01	523.73	2820.74
162.0	471.30	2335.86	523.73	2859.60	2335.86	523.73	2859.60
163.0	474.21	2374.98	523.73	2898.71	2374.98	523.73	2898.71
164.0	477.12	2414.36	523.73	2938.10	2414.36	523.73	2938.10
165.0	480.03	2454.01	523.73	2977.75	2454.01	523.73	2977.75
166.0	482.94	2493.93	523.73	3017.66	2493.93	523.73	3017.66
167.0	485.85	2534.11	523.73	3057.84	2534.11	523.73	3057.84
168.0	488.76	2574.55	523.73	3098.29	2574.55	523.73	3098.29
169.0	491.66	2615.26	523.73	3139.00	2615.26	523.73	3139.00
170.0	494.57	2656.24	523.73	3179.97	2656.24	523.73	3179.97
171.0	497.48	2697.48	523.73	3221.21	2697.48	523.73	3221.21
172.0	500.39	2738.99	523.73	3262.72	2738.99	523.73	3262.72
173.0	503.30	2780.76	523.73	3304.50	2780.76	523.73	3304.50
174.0	506.21	2822.80	523.73	3346.53	2822.80	523.73	3346.53
175.0	509.12	2865.11	523.73	3388.84	2865.11	523.73	3388.84
176.0	512.03	2907.67	523.73	3431.41	2907.67	523.73	3431.41
177.0	514.94	2950.51	523.73	3474.24	2950.51	523.73	3474.24
178.0	517.85	2993.61	523.73	3517.34	2993.61	523.73	3517.34
179.0	520.76	3036.98	523.73	3560.71	3036.98	523.73	3560.71
180.0	523.67	3080.61	523.73	3604.34	3080.61	523.73	3604.34
181.0	526.58	3124.50	523.73	3648.24	3124.50	523.73	3648.24
182.0	529.49	3168.67	523.73	3692.40	3168.67	523.73	3692.40
183.0	532.39	3213.09	523.73	3736.83	3213.09	523.73	3736.83
184.0	535.30	3257.79	523.73	3781.52	3257.79	523.73	3781.52

185.0	538.21	3302.75	523.73	3826.48	3302.75	523.73	3826.48
186.0	541.12	3347.97	523.73	3871.70	3347.97	523.73	3871.70
187.0	544.03	3393.46	523.73	3917.19	3393.46	523.73	3917.19
188.0	546.94	3439.22	542.53	3981.74	3439.22	542.53	3981.74
189.0	549.85	3485.24	562.22	4047.45	3485.24	562.22	4047.45
190.0	552.76	3531.52	582.80	4114.32	3531.52	582.80	4114.32
191.0	555.67	3578.07	604.28	4182.36	3578.07	604.28	4182.36
192.0	558.58	3624.89	626.66	4251.55	3624.89	626.66	4251.55
193.0	561.49	3671.97	649.93	4321.90	3671.97	649.93	4321.90
194.0	564.40	3719.32	674.09	4393.41	3719.32	674.09	4393.41
195.0	567.31	3766.94	699.15	4466.09	3766.94	699.15	4466.09
196.0	570.21	3814.82	725.10	4539.92	3814.82	725.10	4539.92
197.0	573.12	3862.96	751.95	4614.92	3862.96	751.95	4614.92
198.0	576.03	3911.37	776.12	4687.49	3911.37	776.12	4687.49
199.0	578.94	3960.05	797.60	4757.65	3960.05	797.60	4757.65
200.0	581.85	4008.99	816.39	4825.38	4008.99	816.39	4825.38

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1337E+00	0.2156E-04	0.5375E-02	0.1000E-04
0.6687E+00	0.1078E-03	0.2687E-01	0.5000E-04
0.1337E+01	0.2156E-03	0.5375E-01	0.1000E-03
0.6704E+02	0.1079E-01	0.2687E+01	0.5000E-02
0.1006E+03	0.1619E-01	0.4031E+01	0.7500E-02
0.1341E+03	0.2159E-01	0.5375E+01	0.1000E-01
0.3353E+03	0.5398E-01	0.1344E+02	0.2500E-01
0.6706E+03	0.1080E+00	0.2687E+02	0.5000E-01
0.1006E+04	0.1620E+00	0.4031E+02	0.7500E-01
0.1327E+04	0.2151E+00	0.5375E+02	0.1000E+00
0.2651E+04	0.4837E+00	0.1344E+03	0.2500E+00
0.3577E+04	0.8200E+00	0.2687E+03	0.5000E+00
0.4292E+04	0.1590E+01	0.4572E+03	0.1200E+01
0.4536E+04	0.3419E+01	0.7062E+03	0.3000E+01
0.4610E+04	0.6428E+01	0.7919E+03	0.6000E+01

RESULT FROM UPPER-BOUND LINE

TOP LOAD	TOP MOVEMENT	TIP LOAD	TIP MOVEMENT

TON	IN.	TON	IN.
0.1890E+00	0.2621E-04	0.8028E-02	0.1000E-04
0.9449E+00	0.1311E-03	0.4014E-01	0.5000E-04
0.1890E+01	0.2621E-03	0.8028E-01	0.1000E-03
0.9484E+02	0.1313E-01	0.4014E+01	0.5000E-02
0.1423E+03	0.1970E-01	0.6021E+01	0.7500E-02
0.1897E+03	0.2626E-01	0.8028E+01	0.1000E-01
0.4743E+03	0.6567E-01	0.2007E+02	0.2500E-01
0.9486E+03	0.1313E+00	0.4014E+02	0.5000E-01
0.1421E+04	0.1969E+00	0.6021E+02	0.7500E-01
0.1852E+04	0.2600E+00	0.8028E+02	0.1000E+00
0.3477E+04	0.5576E+00	0.2007E+03	0.2500E+00
0.4255E+04	0.8841E+00	0.4014E+03	0.5000E+00
0.4611E+04	0.1623E+01	0.6123E+03	0.1200E+01
0.4780E+04	0.3443E+01	0.7837E+03	0.3000E+01
0.4808E+04	0.6446E+01	0.8123E+03	0.6000E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.8292E-01	0.1722E-04	0.2721E-02	0.1000E-04
0.4146E+00	0.8610E-04	0.1361E-01	0.5000E-04
0.8292E+00	0.1722E-03	0.2721E-01	0.1000E-03
0.4152E+02	0.8614E-02	0.1361E+01	0.5000E-02
0.6229E+02	0.1292E-01	0.2041E+01	0.7500E-02
0.8306E+02	0.1723E-01	0.2721E+01	0.1000E-01
0.2077E+03	0.4308E-01	0.6803E+01	0.2500E-01
0.4154E+03	0.8616E-01	0.1361E+02	0.5000E-01
0.6231E+03	0.1292E+00	0.2041E+02	0.7500E-01
0.8294E+03	0.1723E+00	0.2721E+02	0.1000E+00
0.1816E+04	0.4093E+00	0.6803E+02	0.2500E+00
0.2878E+04	0.7543E+00	0.1361E+03	0.5000E+00
0.3971E+04	0.1557E+01	0.3021E+03	0.1200E+01
0.4293E+04	0.3396E+01	0.6286E+03	0.3000E+01
0.4408E+04	0.6410E+01	0.7674E+03	0.6000E+01

APPENDIX H
GEOTECHNICAL BUSINESS COUNCIL INSERT

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Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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Appendix F

Initial Site Assessment

INITIAL SITE ASSESSMENT FOR
CAMINO DEL MAR BRIDGE REPLACEMENT PROJECT
DEL MAR, SAN DIEGO COUNTY, CALIFORNIA
KLEINFELDER PROJECT NO. 20180876.001A

DRAFT

JULY 2, 2021

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ONLY THE CLIENT OR ITS DESIGNATED REPRESENTATIVES MAY USE THIS DOCUMENT AND ONLY FOR THE SPECIFIC PROJECT FOR WHICH THIS REPORT WAS PREPARED.

Report prepared for:

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INITIAL SITE ASSESSMENT
FOR CAMINO DEL MAR
BRIDGE REPLACEMENT PROJECT
DEL MAR, SAN DEIGO COUNTY, CALIFORNIA

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EXECUTIVE SUMMARY

Kleinfelder, Inc. (Kleinfelder) has completed this Initial Site Assessment (ISA) for HELIX Environmental Planning, Inc. (HELIX/Client) for the Camino Del Mar Bridge Replacement Project (Project) in the City of Del Mar (City), San Diego County, California. The City is planning to replace the existing Camino Del Mar bridge (Bridge Number [No.] 57C-0209), which crosses the San Dieguito River and San Dieguito Lagoon. The bridge serves as an important north-south connection for coastal residents and visitors in the greater San Diego region and is frequently used by motorists, bicyclists, hikers, and pedestrians (see Figure 1 and Figure 2).

Information gathered, and activities performed for this ISA were consistent with those required to address the Caltrans' *Initial Site Assessment (ISA) Checklist* for Hazardous Waste (Appendix DD, Hazardous Waste, Project Development Procedures Manual). The completed *Initial Site Assessment (ISA) Checklist* for Hazardous Waste pursuant to Caltrans' Guidelines is included in Appendix A.

Information regarding environmental concerns that requires consideration is listed below:

- Elevated concentrations of lead (from use of leaded gasoline) and other metals are sometimes associated with older roadways. Based on a review of historical documentation, Camino del Mar has been present since at least 1928. The potential exists for aerially-deposited lead (ADL) to be encountered during construction activities. Soil sampling for the presence of ADL should be performed in unpaved locations of the Project area prior to construction activities. Should lead be detected in the soil samples, a lead compliance plan should be prepared prior to the start of construction activities.
- The Project proposes to replace the Camino Del Mar Bridge structure (Bridge No. 57C-0209). The potential exists for asbestos-containing materials (ACMs) and lead-based paint (LBP) to be present. The ACM survey should be performed in conformance with the United States Environmental Protection Agency (US EPA) National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 Code of Federal Regulation (CFR) Part 61, Subpart M, and San Diego County Air Pollution Control District (SDCAPCD) Rule 1206. The LBP survey should be performed in accordance with California Department of Public Health (CDPH) guidelines.
- One pole-mounted electrical transformer was observed within the Project area. No evidence of staining, or leakage from the transformer was observed. Should transformer removal be required as part of the Project, the local utility company should be notified for proper testing and removal.

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- The potential exists for treated wood waste to be present associated with guard rail posts or pedestrian walkway decking within the Project area. Sampling of the sign, guard rail posts, or decking for the presence of wood-preserving chemicals is recommended prior to demolition, and treated wood waste should be handled consistent with Caltrans' SSP 14-11.14.
- Groundwater depth is anticipated to be near ground surface given the proximity to the San Dieguito River, San Dieguito Lagoon, and the Pacific Ocean. Dewatering of groundwater encountered during construction/excavation activities should adhere to regulatory compliance and permitting consistent with Regional Water Quality Control Board (RWQCB) and National Pollutant Discharge Elimination System (NPDES) requirements, and groundwater sampling should be conducted.
- Although not anticipated in other areas of the Project, should impacted soil (as evidenced by staining and/or odors) be encountered during construction activities, the Resident Engineer overseeing construction should stop work until a hazardous waste specialist is able to assess the soil for proper handling.
- At least two (2) natural gas transmission pipelines, and other utilities run parallel to, or cross the Project area indicating a potential hazard during construction. Coordination with local utility companies to avoid potential impacts is recommended prior to construction activities.

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1 INTRODUCTION

1.1 PURPOSE

Information gathered, and activities performed for this ISA were consistent with those required to address the State of California Department of Transportation's (Caltrans') *Initial Site Assessment (ISA) Checklist* for Hazardous Waste (Appendix DD, Hazardous Waste, Project Development Procedures Manual, July 1, 1999). The completed *Initial Site Assessment (ISA) Checklist* pursuant to Caltrans' Guidelines is included in Appendix A.

1.2 DETAILED SCOPE-OF-SERVICES

The following sections describe Kleinfelder's work scope:

- Section 2, **Project Setting**, is a compilation of information concerning the Project description, Project location, physical setting, and geologic and hydrogeologic conditions.
- Section 3, **Records Review**, is a compilation of Kleinfelder's review of several databases available from the Federal, State, and local regulatory agencies regarding hazardous substance use, storage, or disposal at the Project; and for off-site facilities within a 1-mile radius from the Project. This section also presents information obtained from historical resources to supplement regulatory agency database records.
- Section 4, **Visual Survey**, describes Kleinfelder's observations of the Project area during the site reconnaissance and observations of adjacent properties.
- Section 5, **Evaluation**, is a presentation of our findings and opinions regarding the information in Sections 2, 3 and 4, and presents our conclusions regarding the potential for hazardous materials and hazardous waste involvement in the proposed Project.
- Section 6, **References**, is a summary of the resources used to compile this report.

Pertinent documentation regarding the Project is included in the Appendices of this report. Appendix A contains the Caltrans' *Initial Site Assessment (ISA) Checklist*. The Environmental Data Resources, Inc. (EDR) Radius Map™ Report with GeoCheck® is provided in Appendix B. Agency documentation is provided in Appendix C. Historical information and documentation is presented in Appendix D.

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1.3 SIGNIFICANT ASSUMPTIONS

The subject property is hereafter referred to as the "Project." The Project boundaries are based on information obtained from the Client. The Project conditions discussed herein are limited to readily apparent environmental conditions observed from the public rights-of-way.

Kleinfelder does not guarantee the accuracy of the information supplied by its sources, but reserves the right to rely on this information in formulating a professional opinion on the potential for contamination at the Project site. Kleinfelder also assumes the Client provided all applicable and available environmental records and specialized knowledge regarding the Project. Kleinfelder has not made other significant assumptions during the performance of this ISA.

1.4 LIMITATIONS AND EXCEPTIONS

Environmental assessments are non-comprehensive by nature and are unlikely to identify all environmental problems or eliminate all risk. The attached report is a qualitative assessment. Kleinfelder offers a range of investigative and engineering services to suit the needs of our clients, including more quantitative investigations. Although risk can never be eliminated, more detailed and extensive investigations yield more information, which may help you understand and better manage your risks. Since such detailed services involve greater expense, we ask our clients to participate in identifying the level of service, which will provide them with an acceptable level of risk. Please contact the signatories of this report if you would like to discuss this issue of risk further.

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No warranty, either express or implied is made. Environmental issues not specifically addressed in the report were beyond the scope of our work and not included in our evaluation.

Land use, Project conditions (both on-site and off-site) and other factors will change over time (e.g., EDR Radius Map™ Report with GeoCheck®). Since Project activities and regulations beyond our control could change at any time after the completion of this report, our observations, findings and opinions can be considered valid only as of the date of The EDR Radius Map™ Report with GeoCheck® (June 1, 2021). Additionally, Project conditions observed were limited to readily-apparent environmental conditions observed from roadways and public rights-of-way, since individual parcel access was not granted.

This report may be used only by the Client and the registered design professional in responsible charge, only for the purposes stated within a reasonable time from its issuance, but in no event later than 1 year from the date of the earliest component, The EDR Radius Map™ Report with GeoCheck® (expires June 1,

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2022). Land or facility use, on and off-site conditions, regulations, or other factors may change over time, and additional work may be required with the passage of time. Any party other than the Client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party and Client agrees to defend, indemnify, and hold harmless Kleinfelder from any claim or liability associated with such unauthorized use or non-compliance.

During the course of the performance of Kleinfelder's services, hazardous materials may have been discovered. Kleinfelder assumes no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury that results from pre-existing hazardous materials being encountered or present on the Project site, or from the discovery of such hazardous materials. Nothing contained in this report should be construed or interpreted as requiring Kleinfelder to assume the status of an owner, operator, or generator, or person who arranges for disposal, transport, storage or treatment of hazardous materials within the meaning of any governmental statute, regulation or order. Client is solely responsible for directing notification of all governmental agencies, and the public at large, of the existence, release, treatment, or disposal of any hazardous materials observed at the Project site, either before or during performance of Kleinfelder's services. Client is responsible for directing all arrangements to lawfully store, treat, recycle, dispose, or otherwise handle hazardous materials, including cuttings and samples resulting from Kleinfelder's services.

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2 PROJECT SETTING

The following sections summarize the proposed description and setting of the Project. The Project location is shown on Figure 1 and Figure 2. Figures 2a through 2d present the proposed Project improvements, and Figures 3a through 3h present Project photographs.

2.1 PROPOSED PROJECT DESCRIPTION

The City of Del Mar (City) is planning to replace the existing two-lane Camino Del Mar bridge (Bridge No. 57C-0209) in Del Mar, San Diego County, California. According to the City of Del Mar website (https://www.delmar.ca.us/), the Camino Del Mar bridge was originally built in 1932, widened in 1953, and modified in 2001. The replacement bridge would be located along the same horizontal alignment, would be slightly longer, wider, and higher, and would result in a reduction in the number of piers in the lagoon. The additional bridge width would accommodate two-way pedestrian and bicycle movement across the north and south side of the roadway. The roadway approach zones within Camino Del Mar would also require modifications to accommodate the raised elevation of the bridge, including reconstructing the sidewalks to meet the proposed pedestrian sidewalks on both sides of the replacement bridge. There would be no change in vehicle capacity as the existing two-lane Camino Del Mar roadway would continue to provide two vehicle traffic lanes.

Two staging areas are proposed for the Project. The northern Project staging area is located at the existing training track at the Del Mar Fairgrounds, south of Via De La Valle. The southern Project staging area is at the Del Mar Public Works Yard, located south of the Del Mar Fairgrounds and the San Dieguito Lagoon. No subsurface disturbance is anticipated at the staging areas for the Project.

2.2 PROJECT SETTING

The information presented in Table 2-1 includes the physical location of the Project. This information was obtained from review of topographic maps, aerial photographs, public records at City and/or County offices, interviews, and/or information provided by the Client.

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Table 2-1: Project Setting

PARAMETER	INFORMATION/COMMENTS
LOCATION	The Project area includes the existing bridge along Camino del Mar over the San Dieguito River and San Dieguito Lagoon, and areas immediately surrounding the bridge, in the northwestern part of the City (see Figure 1). It is situated between the State Fairgrounds on the east and the Pacific Ocean on the west, in the City of Del Mar, San Diego County, California (see Figure 1, Project Location Map).
ASSESSOR'S PARCEL NUMBER (APN)	The Project consists of existing right-of-way along Camino del Mar; therefore, it is not associated with an APN. No properties are indicated by the Client to be affected (acquired) by the proposed construction activities. However, two construction staging areas are planned during construction; one located at the State Fairgrounds training track, and the other at a Del Mar Public Works Yard, both located east of the Project area.
ADDRESS(ES)	No addresses are associated with the existing Camino Del Mar bridge or right-of-way.
SECTION, TOWNSHIP, AND RANGE	The Project area is located within Township 14 South, Range 4 West, Section 11, San Bernardino Principal Baseline and Meridian. A portion of the northern staging area at the State Fairgrounds training track is located within the southern portion of Section 2.
ZONING	Based on the Zoning Map, City of Del Mar, November 2001, the Project is in an area with a zoning designation of "FW" representing a Floodway. The staging areas are in an area zoned "FR" representing the Fairgrounds – Race track. Remaining properties surrounding the Project area are zoned for beach commercial, public parkland, residential, and railroad use.

At the time of Kleinfelder's assessment, land use in the immediate Project vicinity appeared to be used for residential and leisure purposes. Table 2-2 presents information about the physical setting of the Project site. This information was obtained from published maps.

Table 2-2: Physical Setting

Data	General Information
USGS TOPOGRAPHIC QUADRANGLE	Based on a review of the United States Geological Survey (USGS) Del Mar, California 7.5-Minute Series (Topographic) Quadrangle Map, dated 2012, elevations along the Project range from approximately 8 feet to 15 feet above mean sea level (msl). General topographic relief is relatively flat in the Project area with a gentle slope to the south and southwest.
SOIL TYPE	Based on information in The EDR Radius Map™ Report with GeoCheck®, the primary soil types in the vicinity of the Project are designated as Lakes and Lagoons, Tujunga, and Tidal Flats, consisting of somewhat excessively drained sand, loamy sand, and stratified gravelly sand (EDR, 2021a; Appendix B).
OIL AND GAS WELLS	Kleinfelder reviewed the California Department of Conservation, Geologic Energy Management Division (CalGEM) Well Finder online database (https://maps.conservation.ca.gov/doggr/wellfinder/#openModal) for oil and gas wells located within the Project vicinity. No oil or gas wells are depicted within the Project limits or within an approximate 0.5-mile distance from the Project limits. A copy of the Well Finder search results is provided in Appendix C.

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Information about the regional geology is presented in Table 2-3. This information was obtained by Kleinfelder from published data and maps, interviews with public agencies, and/or previous investigations performed by Kleinfelder in the Project vicinity.

Table 2-3: Regional Geology and Hydrogeology

PHYSICAL PARAMETER	INFORMATION/COMMENTS
REGIONAL PHYSIOGRAPHY AND GEOLOGY	The Project is located in the San Dieguito Valley of the Peninsular Ranges Geomorphic Province. The Peninsular Ranges consist of a series of ranges separated by northwest trending valleys, subparallel to faults branching from the San Andreas Fault. The Peninsular Ranges extend into lower California and are bound on the east by the Colorado Desert. The geology is similar to the Sierra Nevada Geomorphic Province, with granitic rock intruding the older metamorphic rocks (California Geological Survey [CGS], 2002).
REGIONAL HYDROGEOLOGY	The Project is located in the San Dieguito Groundwater Basin, which underlies Osuna Valley and the lower portion of San Dieguito Valley in central coastal San Diego County. The basin is bound by the Pacific Ocean to the west and elsewhere by non-water bearing parts of the La Jolla Group. The San Dieguito River drains west to the Pacific Ocean (California Department of Water Resources [CDWR], 2004).
DEPTH TO GROUNDWATER AND DIRECTION OF ANTICIPATED FLOW [1]	Historic groundwater levels have been near ground surface with groundwater flow moving westward toward the ocean. Pumping depressions have created an inland flow of sea water (CDWR, 2004).
REGIONAL GROUNDWATER QUALITY PROBLEMS	Regional groundwater impacts associated with hazardous materials in the Project vicinity were not found during the research of this ISA.
WATER SUPPLY	The Project area is not developed with structures requiring water connection services.
FLOOD ZONE DESIGNATION	According to The EDR Radius Map™ Report with GeoCheck® (EDR, 2021a), the majority of the Project is located within a special flood hazard area of 1% annual chance flood. Portions of the Project that adjoin the San Dieguito Lagoon are located within the National Wetland Inventory.

[1] Groundwater flow direction is based on regional information sources. Project-specific conditions may vary due to a variety of factors including geologic anomalies, utilities, nearby pumping wells (if present), and other factors.

2.3 CURRENT USES OF ADJOINING PROPERTIES

Kleinfelder performed a brief drive-by and walking survey of the properties adjoining to the Project area on June 11, 2021. Summary descriptions of the surrounding properties are presented below and the area surrounding the Project is shown on Figure 2, Project Vicinity Map.

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The surrounding area generally consists of undeveloped, recreational, floodplains, and residential properties. The northern portion of the Project (north of the existing bridge) is adjoined by the Del Mar North Bluff Preserve and Dog Beach to the west, followed by the Pacific Ocean, and portions of the San Dieguito River floodway to the east. The San Dieguito Lagoon and associated floodway adjoin the central portion of the Project to the east and west. Residential properties adjoin the southern portion of the Project to the east and west.

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3 RECORDS REVIEW

3.1 STANDARD ENVIRONMENTAL RECORD SOURCES

The purpose of the records review was to obtain and review records that would help to evaluate potential environmental concerns in connection with the Project site and bordering properties. Federal, State, and local regulatory agencies publish databases or "lists" of businesses and properties that handle hazardous materials or hazardous waste, or are the known location of a release of hazardous substances to soil and/or groundwater. These databases are available for review and/or purchase at the regulatory agencies, or the information may be obtained through a commercial database service. Kleinfelder contracted a commercial database service, EDR of Shelton, Connecticut to perform the government database search for listings within the appropriate ASTM minimum search distance of the Project. Kleinfelder provided EDR with a Project map to incorporate the search distances from the Project boundary. Included in the EDR Radius Map™ Report with GeoCheck® is a listing of specific databases outlined by the ASTM Standard. A listing of the search distances, databases evaluated, dates the databases were last updated, and types of information contained in each database are included in the regulatory database search provided as Appendix B to this report.

EDR utilizes a geographical information system to plot the locations of reported spills, leaks, incidents, etc. Kleinfelder reviews this information to help establish if the Project, or nearby properties, have been included in the noted databases and lists. Each of the listings was reviewed to assess whether the corresponding property details included in the EDR report revealed a potential environmental impact to the Project. A number of listings in the EDR database report were found not to have the potential to impact the Project based on the following, or a combination thereof:

- The listed property was located at a distance where the facility would be unlikely to impact the Project based on Kleinfelder's evaluation of the relevant data in the EDR report and knowledge of the Project vicinity.
- The listed property was in a down-gradient or cross-gradient direction from the Project, based on the anticipated direction of groundwater flow at the property being evaluated, and is located at a distance that would be unlikely to impact the Project. Note that groundwater flow direction may be variable near the Project and determinations as to down- or cross-gradient direction were made only when groundwater flow direction was available for a specific location.
- The listed property was identified in the Underground Storage Tank (UST) or Small Quantity Generator (SQG) databases and was not on or immediately adjoining the Project. The property

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was not listed in other databases that reported a release of a hazardous substance or petroleum product and/or was not listed as having environmental violations. The listing of a facility in these databases alone is not indicative of an unauthorized release.

- The listing for the facility suggested a short-term release had occurred (i.e., from incidental traffic accidents, or chemicals from illegal drug labs found at residences) with associated response actions completed.
- The quantity of the hazardous substances or petroleum product released from an offsite facility was not considered to have resulted in contamination above the most stringent criteria that would require regulatory action. Therefore, no impact to the Project is anticipated.
- The listed property record indicates that the property was characterized, the reported release affected soil only, the listed property was not on or adjacent to the Project, and the release was not recognized as indicative of area-wide conditions or was characterized as a soil removal action only.
- The listed property record indicates that contamination on the property is limited to relatively non-mobile contaminants, including polyaromatic hydrocarbons and metals, in soil only, on a non-adjacent property.
- The listed property record indicates that the case has been closed to the satisfaction of the designated lead regulatory agency and residual contamination, if present, is not considered likely to affect the Project based on one or more of the criteria mentioned in the bulleted items above.

Based on these criteria indicating no material threat of a release that affected the Project and/or no release that could require future regulatory agency oversight, these listings were not evaluated further and are not discussed in the following sections.

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3.2 RESULTS OF DATABASE SEARCH

The remaining property listings were reviewed to assess whether these properties had environmental releases, which may have resulted in environmental concerns in relation to the Project. The listed properties for which a reported release may have resulted in a REC or an environmental concern were further assessed by performing a review of agency files available through the SWRCB's GeoTracker™ website (https://geotracker.waterboards.ca.gov/) and other relevant regulatory agency websites and offices, to evaluate whether the listed release represents a potential impact to the Project.

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3.2.1 Project Listings

No properties or facilities within the Project limits were listed in databases searched by EDR.

3.2.2 Off-Site Listings

No off-site properties or facilities were identified that may represent a hazardous waste impact to the Project.

3.2.3 Orphan List

Sites not plotted by EDR due to poor or inadequate address information are referred to as orphan sites. Six orphan sites are listed in The EDR Radius Map™ Report with GeoCheck®. The listed orphan sites fall under one, or more of the criteria listed in Section 3.1, and do not represent a hazardous waste impact to the Project.

3.3 ADDITIONAL AGENCY ENVIRONMENTAL RECORDS

Local regulatory agencies were contacted for reasonably ascertainable and practically reviewable documentation regarding environmental conditions present at the Project site and adjoining facilities. The following agencies (if marked with an "X") were contacted for documentation:

- ☒ California Department of Conservation, Geologic Energy Management Division (CalGEM)
- ☐ San Diego County Air Pollution Control District (APCD)
- ☒ San Diego County Department of Environmental Health (DEH)
- ☒ State Water Resources Control Board Quality Control Board
- ☒ State Department of Toxic Substances Control (DTSC)
- ☒ Pipeline and Hazardous Materials Safety Administration (PHMSA), National Pipeline Mapping System (NPMS)

Information from these agencies is presented below.

3.3.1 California Department of Conservation, Geologic Energy Management Division

Kleinfelder reviewed and obtained public information from the CalGEM website (https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx). No oil or gas wells were reported

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within the Project limits, or in the immediate vicinity. A copy of the search results is provided in Appendix C.

3.3.2 San Diego County Air Pollution Control District

Properties and facilities within, or adjoining to the Project limits, which may emit hazardous pollutants that could affect the Project were not noted. Therefore, a written request for information was not submitted to the APCD. Information pertaining to hazardous air pollutants would likely be included in the EDR database report. No significant air pollution issues were identified.

3.3.3 San Diego County Department of Environmental Health

Kleinfelder searched the DEH document library website (https://www.sandiegocounty.gov/content/sdc/deh/doclibrary/) for information on hazardous waste permitted and corrective action facilities, as well as existing site cleanup information, for properties that may represent a hazardous waste impact to the Project. Based on a search of the SWRCB GeoTracker™ database, various releases were depicted at the Del Mar Fairgrounds property, the western boundary of which is approximately 675 feet east of the Project area (not including staging areas). Of the reported releases, two were further evaluated by reviewing DEH records, as summarized below. Copies of pertinent information is included in Appendix C.

The Del Mar Fairgrounds had reported releases of gasoline and diesel fuel that affected groundwater, and were associated with DEH case numbers H04644-001 and H04644-003. The releases occurred at a maintenance area located approximately 300 feet east of the northern Project staging area. According to a March 28, 1997 letter with subject, “Additional Information to Support No Further Action Decision” (Metcalf & Eddy, 1997), unauthorized releases were reported from a 2,000-gallon gasoline UST and a 550-gallon diesel UST, which were removed July 27, 1987 and July 6, 1993, respectively. The USTs were adjacent to one another, and contaminated soil was excavated during the 1993 removal activities in an area of approximately 15-feet by 15-feet, to a depth of approximately 5.5. feet below ground surface (bgs). Eight groundwater monitoring wells were installed to assess groundwater conditions. The latest groundwater monitoring activities performed in February 1995 indicated the presence of benzene as the only contaminant of concern in one of the eight wells at a concentration of 0.38 milligrams per liter. The extent of groundwater contamination was depicted to be contained within the limits of the maintenance area. Case No. H04644-002 was also open for this location to assess a failed integrity test, but no further action was required for that case. Based on the limited impacts to groundwater, the unauthorized releases

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associated with these DEH case numbers are not considered likely to have impacted conditions beneath the Project staging or construction areas.

A release was also reported at the Del Mar Fairgrounds associated with DEH Case No. H03436-001. Based on a report of "Groundwater Monitoring at the Former Underground Storage Tank" (Sellens Environmental, 2000), a release was discovered during removal of a 2,000-gallon gasoline UST in October 1997 from a maintenance area located on the southern portion of the property. This maintenance area is located approximately 450 feet northeast of the southern Project staging area. Four groundwater monitoring wells were installed at this location and monitored in January and May 2000. Groundwater flow was reported toward the southwest. The extent of soil contamination was reported to be limited to the immediate area of the former UST. Groundwater contamination was reported to have migrated approximately 125 feet to the southwest (toward the southern Project staging area) of the former UST location. The petroleum hydrocarbons in groundwater were reported to be aged or weathered, and likely from an original UST at this same location rather than the UST removed in 1997. Analytical results were reported to be below water quality levels set by the RWQCB. The case was subsequently closed by the DEH on October 12, 2000. Based on the limited impacts to groundwater, the unauthorized release associated with this DEH case number is not considered likely to have impacted conditions beneath the Project staging or construction areas.State Water Resources Control Board, GeoTracker™ Database

Kleinfelder reviewed the SWRCB GeoTracker™ online database for information pertaining to properties within the Project and vicinity. Various releases were depicted at the Del Mar Fairgrounds property, the western boundary of which is approximately 675 feet east of the Project site (not including staging areas). Limited documentation was available in the GeoTracker™ database for the releases. Based on the limited information presented, two were further evaluated by reviewing DEH records, as summarized in Section 3.3.3 above. However, based on the DEH records reviewed, the releases associated with the two listings were not considered a hazardous waste impact to the Project. In addition, no other properties were identified that may represent a hazardous waste impact to the Project.

3.3.4 California Department of Toxic Substances Control, EnviroStor Database

The DTSC was contacted for information on hazardous waste permitted and corrective action facilities, as well as existing site cleanup information, for properties that may represent a hazardous waste impact to the Project. One listing was reported in the DTSC EnviroStor database. "Camp C.J. Miller" was identified at the State Fairground property, the western boundary of which is approximately 675 feet east of the Project. Based on a "Site Survey Summary Sheet for DERP-FUDS Site No. J09CA732800," for the Camp C.J.

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Miller, dated August 3, 1999, the boundaries of the Camp C.J. Miller facility extended west to the Pacific Ocean, including the Project site.

The Camp C.J. Miller facility was commonly known as the Del Mar Fairgrounds, or the Del Mar Racetrack. The United States Marine Corps occupied and used the racetrack facilities in 1942 and 1943, using the horse stalls to camp in, running on the racetrack for athletic conditioning and riding horses, and practicing hand-to-hand combat near the horse stables. Marine paratroopers practiced beach landings with rubber boats on the beach adjacent to the fairgrounds. The racetrack and fairgrounds resumed operations in 1946. A site visit performed on May 18, 1999 did not reveal evidence of visible signs of former military use of the property. Based on the type of use by the Marine Corps, the former use of the property, which included the Project area, is not considered a hazardous waste impact to the Project. A copy of the EnviroStor documentation is included in Appendix C.

3.3.5 Pipeline and Hazardous Materials Safety Administration, National Pipeline Mapping System

According to the Pipeline Safety Division of the Office of the State Fire Marshal, information regarding pipelines that transport hazardous substances within the vicinity of the Project area is available through the Pipeline and Hazardous Materials Safety Administration's NPMS at https://pvnpms.phmsa.dot.gov/PublicViewer/. Based on our review of the information on the NPMS, no pipelines were depicted on maps to be located within the vicinity of the Project area. However, during the site reconnaissance performed June 11, 2021, at least two (2) natural gas pipelines were noted within the Project. A high-pressure underground natural-gas transmission pipeline marker was observed along the east side of Camino Del Mar, south of the bridge. It is a 12-inch Southern California Gas natural gas pipeline that was noted (via pipeline markers) buried along the eastern portion of the Project running in a north-south direction. The natural gas pipeline was noted to run beneath the east side bridge (Figure 3b, Photograph 3). A 4-inch San Diego Gas & Electric natural gas pipeline was also noted to be present along the western side of the bridge (Figure 3c, Photographs 5 and 6).

3.4 HISTORICAL INFORMATION SOURCES

The history of the Project was researched to identify obvious uses of the Project and vicinity. This information was used to supplement regulatory agency database records previously discussed. Historical information sources reviewed included, if available, Sanborn Fire Insurance Maps, aerial photographs, and topographic maps. Copies of these historical maps and photographs are provided in Appendix D. Table 3-1 summarizes the availability of historical information reviewed during this assessment.

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Table 3-1: Historical Information Sources

Source	Years Reviewed	Source / Availability
SANBORN FIRE INSURANCE MAPS	Not available	EDR, 2021b
HISTORICAL AERIAL PHOTOGRAPHS	1928, 1939, 1949, 1953, 1964, 1966, 1970, 1979, 1985, 1990, 1994, 1997, 2002, 2005, 2009, 2012, 2016	EDR, 2021c
HISTORICAL TOPOGRAPHIC MAPS	1953, 1967, 1975, 1994, 2012	EDR, 2021d
CITY DIRECTORIES	1969 through 2017 (select years)	EDR, 2021e

3.5 HISTORICAL AERIAL PHOTOGRAPHS

A review of historical aerial photography may indicate past activities at a property that may not be documented by other means or observed during a reconnaissance visit. The effectiveness of this technique depends on the scale and quality of the photographs and the available coverage. Aerial photographs were obtained from several historical photograph collections through EDR (2021c) and span a period of 88 years. A tabulation of the aerial photographs reviewed by Kleinfelder is presented in Table 3-2. Copies of the aerial photographs provided by EDR are included in Appendix D.

Table 3-2: Historical Aerial Photographs Reviewed

YEAR	SCALE	SUMMARY
1928	1”=500’	**Project Area:** The Project area appears developed with the existing Camino Del Mar roadway and bridge in a north-south configuration. The San Dieguito Lagoon is apparent passing under the bridge. **Surrounding Area:** The surrounding area appears as undeveloped coastline with no structures observed. The San Dieguito Lagoon and associated floodway is apparent surrounding the Project area. A railroad is noted approximately 500 feet east of the Project area. The fairground property has not yet been developed.
1939	1”=500’	**Project Area:** The Project area appears similar to the 1928 aerial photograph. The southern Project staging area appeared to have a small structure on it. **Surrounding Area:** Residential properties are apparent to the south and north of the Project area although not adjoining. The San Dieguito River inlet that flows beneath the Project area appears to have been altered by the forming of sand floodplains. Construction of the Del Mar Fairgrounds and racetrack is apparent to the east of the Project area, beyond the railroad tracks.

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YEAR	SCALE	SUMMARY
1949 1953 1964 1966	1”=500’	**Project Area:** The Project area appears similar to previously-reviewed aerial photographs. Slight roadway widening improvements. Were noted between 1949 and 1964. The northern Project staging area appeared to consist of a small structure and limited parking by 1964. The southern Project staging area appeared to have a small structure and possible AST noted on the southern Project staging area between 1949 and 1964, and appeared to be further developed in 1966. **Surrounding Area:** Increased residential development is apparent to the south, west, and north of the Project area. The San Dieguito River inlet appears to have been infilled with sand blocking water flow to the lagoon. Further structure development is apparent at the Del Mar Fairgrounds.
1970 1979 1985 1990	1”=500’	**Project Area:** The Project area appears similar to previously-reviewed aerial photographs except Camino Del Mar appears to have been widened into a multi-lane roadway. A training track is apparent on the northern Project staging area by 1979, but was reconstructed its current configuration by 1985. The southern Project staging area appears to be paved with additional structures by 1985. **Surrounding Area:** An east-west channel is apparent extending beneath the Project area from the San Dieguito Lagoon to the Pacific Ocean. The North Bluff Reserve north of the Project area and residential development south of the Project appear consistent with present day conditions. Numerous large buildings and associated parking areas are apparent at the Del Mar Fairgrounds.
1994 1997 2002 2005 2009 2012 2016	1”=500’	**Project Area:** The Project area appears similar to previously-reviewed aerial photographs. **Surrounding Area:** The San Dieguito River inlet configuration continues to change throughout the years likely associated with tidal influence and seasonal rainfall. The adjoining properties appear generally the same as on the previous aerial photographs.

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3.6 HISTORICAL TOPOGRAPHIC MAP REVIEW

Kleinfelder obtained and reviewed historical topographic maps of the Project vicinity from EDR (2021d). The topographic maps reviewed for this assessment are listed in Table 3-3 and copies of the maps are included in Appendix D.

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Table 3-3: Historical Topographic Maps Reviewed

YEAR	SCALE	SUMMARY
1953	1:24,000	**Project Area:** The Project area is developed with a four-lane roadway (labeled Coast Highway) and bridge structure in a north-south orientation. The San Dieguito River is depicted flowing in an east-west direction to the San Dieguito Lagoon (both features unlabeled) crossing beneath the elevated central portion of the Project. The northern Project staging area appears undeveloped, and the southern Project area appears to consist of two possible ASTs. **Surrounding Area:** Residential structures are apparent scattered to the northwest and southwest of the Site. A railroad, the Del Mar Racetrack, and Del Mar Airport are depicted to the east and southeast of the Project.
1967 1975	1:24,000 1:24,000	**Project Area:** The Project area appears generally the same as the 1953 topographic map; however, Camino Del Mar is now labeled. The northern Project staging area is developed with a small structure. The southern Project staging area is labeled as a filtration plant, next to the two possible ASTs. **Surrounding Area:** The existing residential area along the southern portion of the Project area is shaded red indicating a densely populated area. An Atchison Topeka and Santa Fe Railroad (present day North County Transit District rail line) is noted east of the Project, followed by the Del Mar Racetrack. A sewage disposal pond is now depicted in the vicinity of the former Del Mar Airport, which is no longer observed. Interstate 5 freeway is depicted beyond.
1994	1:24,000	**Project Area:** The Project area appears generally the same as previously reviewed topographic maps except Camino Del Mar has been improved to a secondary highway. The northern Project staging area appears to be developed with the existing training track and no structures are shown. The southern Project staging area is no longer shown as a filtration plant with ASTs. **Surrounding Area:** The surrounding area is increasingly developed with residential properties. A fire station is noted east of the Site along the southwestern portion of the Del Mar Racetrack property.
2012	1:24,000	**Project Area:** The 2012 topographic map depicts physical features (e.g., roads and surface water), but does not depict structures. San Dieguito Valley and San Dieguito River are shown. Camino del Mar and bridge are shown. **Surrounding Area:** No structures are shown in the surrounding area, although the area is currently developed.

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3.7 CITY DIRECTORIES

City directories provide information regarding property occupants by address. EDR provided a city directory image report, included in Appendix D, for the period between 1969 and 2017 (EDR, 2021e). The

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Project area is not associated with a street address; therefore, a search of listings was performed for properties along Camino Del Mar. Based on a review of the city directory image report, properties immediately surrounding the Project have been used, and are currently used for residential purposes.

3.8 PREVIOUS DOCUMENTS / REPORTS

Kleinfelder was not provided with other information or documents pertaining to the Project.

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4 VISUAL SURVEY

4.1 METHODOLOGY AND LIMITING CONDITIONS

A site reconnaissance was performed on June 11, 2021, to assess and photograph present Project conditions. The Project location and Project vicinity are shown on Figure 1 and Figure 2, respectively. The proposed Project improvement areas are shown on Figures 2a through 2d. Color photographs of the Project are presented as Figures 3a through 3h. A summary of Project conditions observed from the roadway is provided below.

4.2 RESULTS OF SITE RECONNAISSANCE

The Project area consists of the Camino Del Mar bridge (Bridge No. 57C-0209), which crosses the San Dieguito Lagoon, and portions of Camino Del Mar extending to the north and south of the bridge. Camino del Mar is a two-lane roadway, with an unpaved center median and a pedestrian walkway located on the west side of the bridge. Structures and/or features observed within the Project limits include the bridge, cross-walk lighting, and signs. The potential exists for ACM and LBP to be present in the bridge structure.

The Project vicinity is comprised of a mix of single- and multi-family residential properties. Public parking spaces are available along both sides of Camino Del Mar, north and south of the bridge. An environmentally sensitive area exists east of the northern side of the bridge. Public recreation areas (Dog Beach) are located west of the Project and San Dieguito Lagoon is located to the east.

Storm drains were observed throughout the Project area, within the right-of-way of the roadway. In addition, storm drain curb inlets and catch basins were observed along streets/roads adjoining to the Project as part of the curb and gutter system. One storm drain outfall pipe was noted along the west side of the southern portion of the bridge.

The San Dieguito River is located within the Project area and traverses beneath the Camino Del Mar bridge in a general east to west direction. The San Dieguito River is listed on the impaired 303(d) listed waters (https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2012.shtml) for enterococcus, fecal coliform, nitrogen, phosphorus, total dissolved solids, and toxicity with an estimated total maximum daily load (TMDL) completion of 2021.

Various utility-related infrastructure was observed within the Project limits. Affected utilities (e.g., water, irrigation, sewer, and gas pipelines; fire-hydrant, electric, and telephone,) have the potential to impact

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the Project during construction activities. A high-pressure underground natural-gas transmission pipeline marker was observed along the west side of Camino Del Mar, south of the bridge. It was associated with a 12-inch natural gas pipeline that was noted to run beneath the east side of the bridge, along with a 4-inch natural gas pipeline ran beneath the west side of the bridge. One pole-mounted transformer was noted installed on an electrical power pole along the southwest side of the Project. The potential exists for PCBs to be present in electrical equipment within the Project area.

Access to the proposed staging areas was not available at the time of this ISA. Therefore, observations of these areas are not provided.

4.3 INTERVIEWS

Interviews were not performed since the Project consists of public rights-of-way and private properties will not be acquired as part of the Project.

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5 EVALUATION

The following section describes Kleinfelder's findings and presents our recommendations regarding potential hazardous materials or hazardous waste involvement in the proposed Project.

5.1 FINDINGS

The Project includes the existing bridge along Camino Del Mar and areas immediately surrounding the bridge in the northwestern part of the City. According to the City of Del Mar website (https://www.delmar.ca.us/), the Camino Del Mar bridge was originally built in 1932, widened in 1953, and modified in 2001. The City is planning to replace and widen the Camino Del Mar bridge and it will include the addition of two-way pedestrian and bicycle paths. In addition, roadway approach zones within Camino Del Mar will require modifications to accommodate the raised elevation of the bridge, including reconstructing the sidewalks to meet the proposed pedestrian sidewalks on both sides of the replacement bridge.

Federal, State, and local regulatory agencies publish databases, which were reviewed to identify businesses, and properties that handle hazardous materials or hazardous waste, or are the known location of a release of hazardous substances to soil and/or groundwater. In addition, local regulatory agencies were contacted for reasonably ascertainable and practically reviewable information regarding environmental conditions present at facilities in the Project vicinity. Based on our review of these sources, no properties were identified as potentially hazardous waste impacts to the Project.

On June 11, 2021, Kleinfelder performed a reconnaissance of the Project area and vicinity to assess and photograph present Project conditions. The Project consists of the Camino Del Mar bridge, portions of Camino Del Mar to the north and south of the bridge, and existing right-of-way. A summary of the site reconnaissance findings is presented as follows:

- The Project vicinity is comprised of a mix of single- and multi-family residential properties. Public parking spaces are available along both sides of Camino Del Mar north and south of the bridge. An environmentally-sensitive area exists east of the northern side of the bridge. Public recreation areas are located west of the Project area and San Dieguito Lagoon is located to the east.
- The Camino Del Mar bridge is currently a two-lane bridge on Camino Del Mar passing over the San Dieguito River. Pressure treated wooden pedestrian deck and railings is located along the west side of the bridge. The potential exists for ACMs and LBP to be present in bridge structures.

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- Structures and/or features observed within the Project area included the Camino del Mar bridge, cross-walk lighting, signs, and utility infrastructure. Affected utilities (e.g., water, irrigation, sewer, and gas pipelines; fire hydrant, electric, and telephone lines) have the potential to impact the Project during construction activities. The potential exists for PCBs to be present in electrical equipment within the Project area, including a pole-mounted transformer on the southwest side of the Project.
- A high-pressure underground natural-gas transmission pipeline marker was observed along the west side of Camino Del Mar, south of the bridge. It was observed to be a 12-inch natural gas pipeline that was noted to run beneath the east side of the bridge, along with a 4-inch natural gas pipeline ran beneath the west side of the bridge.
- Storm drains were observed in the Project area right-of-way. In addition, storm drain curb inlets and catch basins were observed along streets/roads adjoining to the Project as part of the curb and gutter system. One storm drain outfall pipe was noted along the west side of the southern portion of the bridge.
- The San Dieguito River is located within the Project area and traverses beneath the Camino Del Mar bridge, in a general east to west direction.

5.2 RECOMMENDATIONS

During the preparation of the ISA, the following information that could potentially affect environmental conditions was revealed:

- Elevated concentrations of lead (from use of leaded gasoline) and other metals are sometimes associated with older roadways. Based on a review of historical documentation, Camino del Mar has been present since at least 1928. The potential exists for ADL to be encountered during construction activities. Soil sampling for the presence of ADL should be performed in unpaved locations of the Project area prior to construction activities. Should lead be detected in the soil samples, a lead compliance plan should be prepared prior to the start of construction activities.
- The Project proposes to replace the Camino Del Mar Bridge structure (Bridge No. 57C-0209). The potential exists for ACMs and LBP to be present. The ACM survey should be performed in conformance with the US EPA NESHAP 40 CFR Part 61, Subpart M, and SDCAPCD Rule 1206. The LBP survey should be performed in accordance with CDPH guidelines.

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- One pole-mounted electrical transformer was observed within the Project area. No evidence of staining, or leakage from the transformer was observed. Should transformer removal be required as part of the Project, the local utility company should be notified for proper testing and removal.
- The potential exists for treated wood waste to be present associated with guard rail posts or pedestrian walkway decking within the Project area. Sampling of the sign, guard rail posts, or decking for the presence of wood preserving chemicals is recommended prior to demolition, and treated wood waste should be handled consistent with Caltrans' SSP 14-11.14.
- Groundwater depth is anticipated near ground surface given the proximity to the San Dieguito River, San Dieguito Lagoon, and Pacific Ocean. Dewatering of groundwater encountered during construction/excavation activities should adhere to regulatory compliance and permitting consistent with RWQCB and NPDES requirements, and groundwater sampling should be conducted.
- Although not anticipated in other areas of the Project, should impacted soil (as evidenced by staining and/or odors) be encountered during construction activities, the Resident Engineer overseeing construction should stop work until a hazardous waste specialist is able to assess the soil for proper handling.
- At least two (2) natural gas transmission pipelines, and other utilities run parallel to, or cross the Project area indicating a potential hazard during construction. Coordination with local utility companies to avoid potential impacts is recommended prior to construction activities.

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Additional sources may be referenced separately in the report text.

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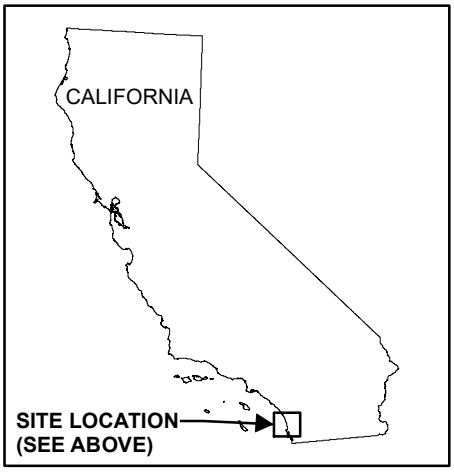
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FIGURES

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PROJECT VICINITY MAP

INITIAL SITE ASSESSMENT FOR
CAMINO DEL MAR BRIDGE REPLACEMENT PROJECT
DEL MAR, SAN DIEGO COUNTY, CALIFORNIA

FIGURE

1

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PROJECT LOCATION MAP

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FIGURE
2



MATCHLINE A

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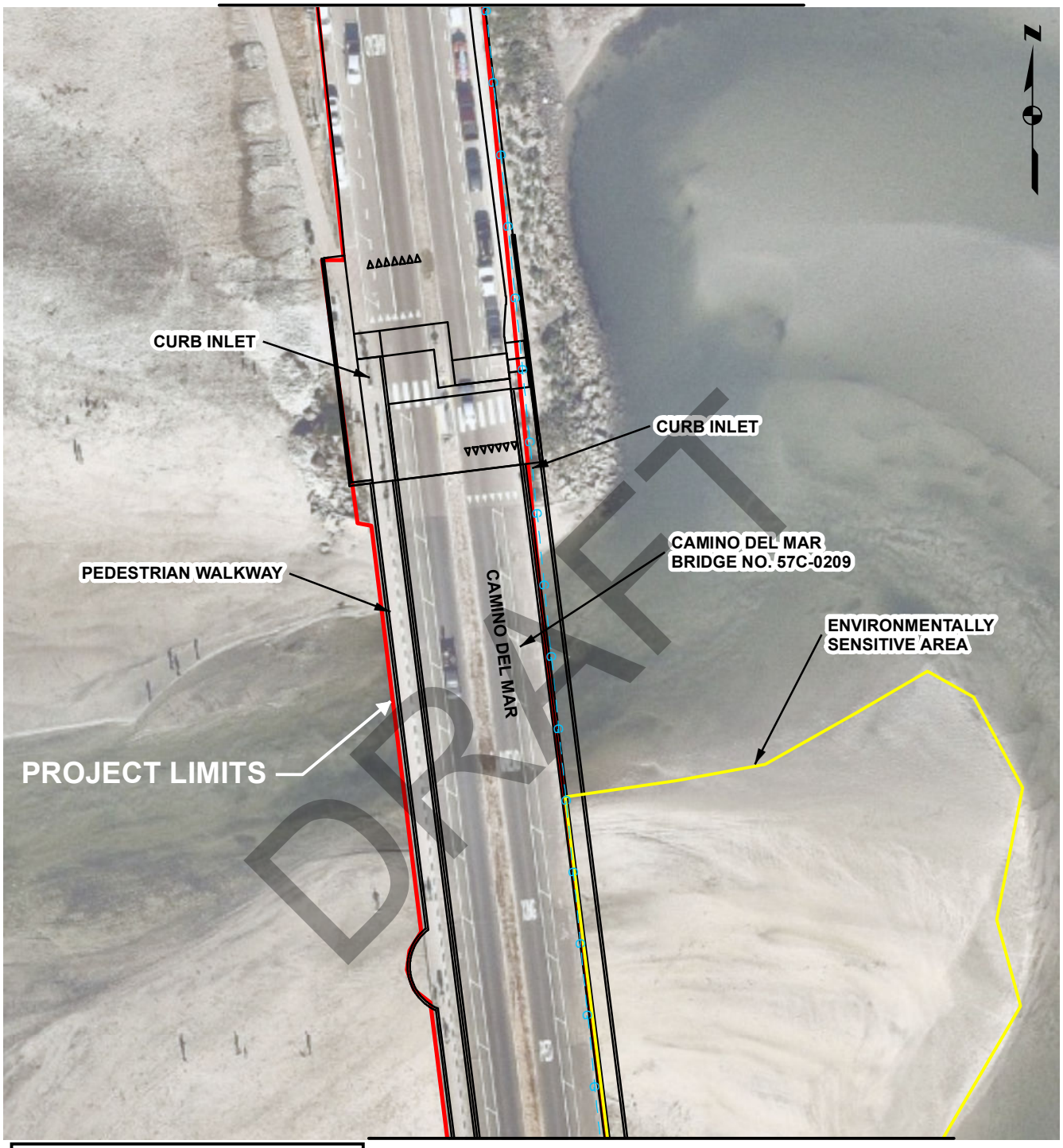
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PROJECT LOCATION MAP

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FIGURE

2a



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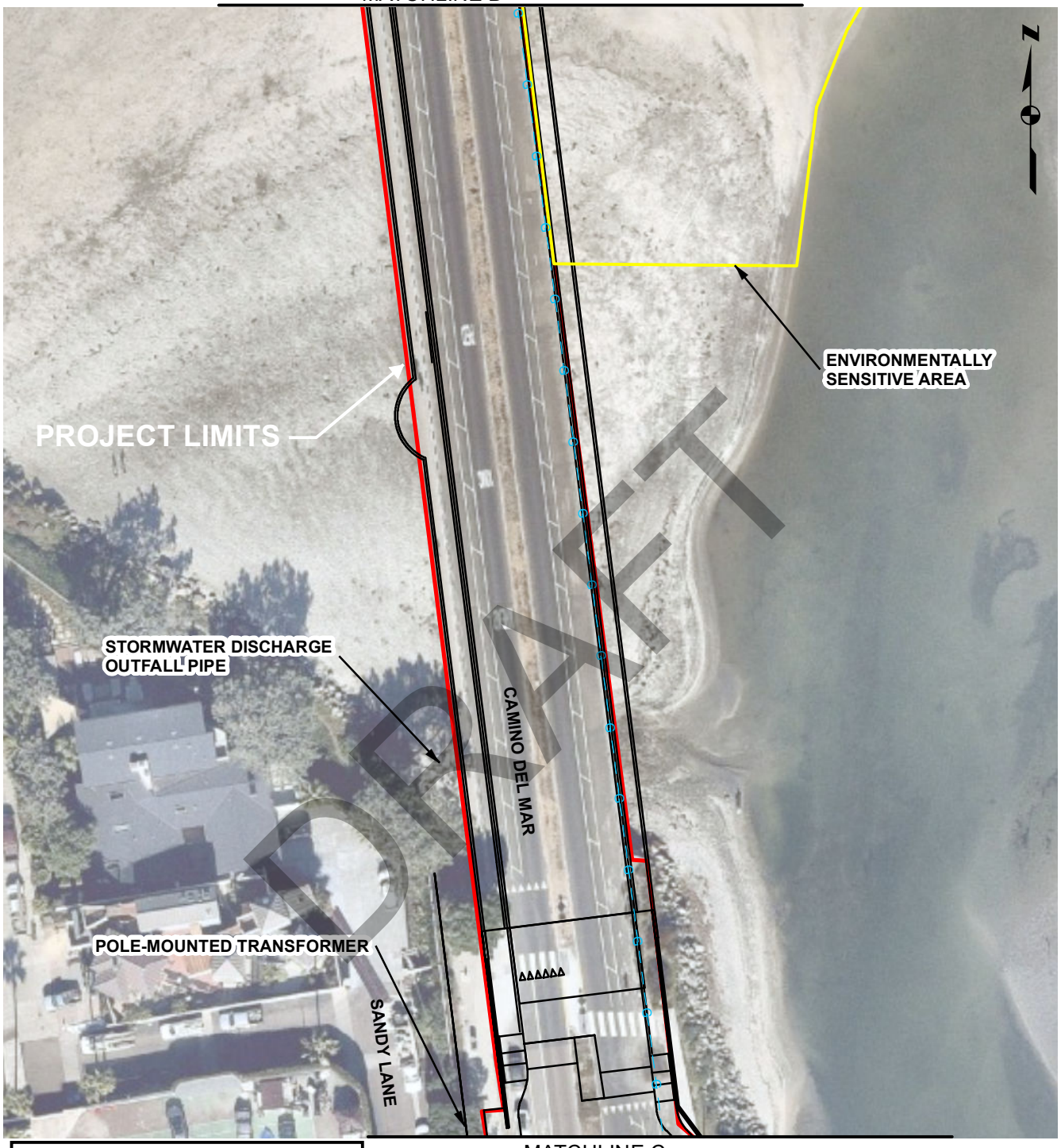
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PROJECT LOCATION MAP

INITIAL SITE ASSESSMENT FOR
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DEL MAR, SAN DIEGO COUNTY, CALIFORNIA

FIGURE

2b



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PROJECT LOCATION MAP

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FIGURE
2c

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PROJECT LOCATION MAP

INITIAL SITE ASSESSMENT FOR
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DEL MAR, SAN DIEGO COUNTY, CALIFORNIA

FIGURE
2d

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Photograph 1 - View of Camino Del Mar Bridge from east side of bridge structure, looking southwest.



Photograph 2 - View of Camino Del Mar Bridge from east side of bridge structure, looking northwest.

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Photograph 3 - View of 12-inch natural gas pipeline and apparent City of Del Mar water line running beneath the east side of bridge structure, looking west.



Photograph 4 - View of bridge structure from west side, looking east.

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Photograph 5 - View of bridge structure from west side, looking southeast.



Photograph 6 - View of south bridge abutment and apparent 4-inch natural gas pipeline from underside of Camino Del Mar Bridge, looking north.

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Photograph 7 - Close view of southern concrete support structures from underside of Camino Del Mar Bridge.



Photograph 8 - View of pedestrian walkway along the west side of bridge structure, looking south.

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Photograph 9 - View of pedestrian walkway along the west side of bridge structure, looking north.



Photograph 10 - View of storm drain outfall pipe located southwest side of the bridge structure.

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Photograph 11 - View of the southern portion of the Project area, looking north.



Photograph 12 - View of utility vault located east of Camino Del Mar, looking north.

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Photograph 13 - View of the northern portion of the Project area, looking north.



Photograph 14 - View of stormwater curb inlet along northeastern portion of the Project, looking southeast. The Del Mar Fairgrounds observed in the distance.

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Photograph 15 - View of Camino Del Mar Bridge and Project area looking south.



Photograph 16 - View of electrical transmission lines and pole-mounted transformers along southwestern side of Camino Del Mar.

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APPENDIX A
INITIAL SITE ASSESSMENT CHECKLIST

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Initial Site Assessment (ISA) Checklist

Project Information

District 11 County San Diego

Route Camino Del Mar between just north of Sandy Pointe to approximately 800 feet south of Via De La Valle; Camino Del Mar Bridge Replacement Project (Project).

Description

The proposed Camino Del Mar Bridge Replacement Project involves the replacement of the existing Camino Del Mar bridge (Bridge No. 57C-0209), which crosses the San Dieguito Lagoon in the City of Del Mar, San Diego County California. The Project area is shown on Figure 1, Figure 2, and Figures 2a through 2d of the ISA Report. A Project Description is included in Section 2.1 of the ISA report.

Is the project on the HW Study Minimal-Risk Projects List? Unknown

Project Manager Unknown phone # N/A

Project Engineer Unknown phone # N/A

Project Screening

Attach the Project location map to this checklist to show location of all known and/or potential HW sites identified.

1. Project Features: New R/W? No Excavation? X Railroad Involvement? No
   Structure demolition/modification? Replacement of Camino Del Mar Bridge.
   Subsurface utility relocation? X

2. Project Setting: Camino Del Mar between just north of Sandy Pointe to approximately 800 feet south of Via De La Valle.
   Rural or Urban Rural and Urban.
   Current land uses: Existing Camino Del Mar bridge, roadway, and associated right-of-way.
   Adjacent land uses: Mix of single- and multi-family residential and recreational properties. (industrial, light industry, commercial, agricultural, residential, etc.)

3. Check federal, State, and local environmental and health regulatory agency records as necessary, to see if any known hazardous waste site is in or near the Project area. If a known site is identified, show its location on the attached map and attach additional sheets, as needed, to provide pertinent information for the proposed project. No hazardous waste sites identified.

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Initial Site Assessment (ISA) Checklist

(continued)

4. Conduct Field Inspection. Date: June 11, 2021
   Use the attached map to locate potential or known HW sites. No known or potential hazardous waste sites identified.

   STORAGE STRUCTURES / PIPELINES:
   Underground tanks: Not identified
   Surface tanks: Not observed
   Sumps: Not observed
   Ponds: Not identified
   Drums: Not observed
   Basins: Not observed
   Transformers Aboveground electrical transmission lines and at least one electrical transformer were observed along the west side of Camino del Mar, south of the Camino del Mar bridge. Potential for polychlorinated biphenyl (PCB)-containing oils to be present in pole-mounted transformers.
   Landfill Not observed.
   Other: San Dieguito River and San Dieguito Lagoon are present within the Project area.
   At least two (2) natural gas pipelines and other utilities run beneath the Camino del Mar bridge, and parallel to or cross the Project area.

   CONTAMINATION: (spills, leaks, illegal dumping, etc.)
   Surface staining: Not observed
   Oil sheen: Not observed
   Odors: No odors noted
   Vegetation damage: Not observed
   Other: N/A
   HAZARDOUS MATERIALS: (asbestos, lead, etc.)

   Buildings No
   Spray-on fireproofing N/A
   Pipe wrap Unknown
   Friable tile N/A
   Acoustical plaster Unknown
   Serpentine Unknown
   Paint Potential in bridge structure
   Other See No. 6 below.

5. Additional record search, as necessary, of subsequent land uses that could have resulted in a hazardous waste site. Use the attached map to show the location of potentially hazardous waste sites. No hazardous waste sites identified.

6. Other comments and/or observations:

   - Elevated concentrations of lead (from use of leaded gasoline) and other metals are sometimes associated with older roadways. Based on a review of historical documents for the Site and surrounding area, aerially-deposited lead (ADL) has the potential to be encountered during construction activities.

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Initial Site Assessment (ISA) Checklist

(continued)

- The Project proposes to replace the Camino Del Mar Bridge structure (Bridge No. 57C-0209). The potential exists for asbestos-containing materials (ACMs) and lead-based paint (LBP) to be present.
- Soil sampling for the presence of ADL should be performed in unpaved locations of the Project area. Should lead be detected in the soil samples, a lead compliance plan should be prepared prior to the start of construction activities.
- Sampling of the pedestrian walkway decking or guard rail posts for the presence of wood-preserving chemicals is recommended prior to demolition and treated wood waste should be handled consistent with Caltrans' SSP 14-11.14.
- One pole-mounted electrical transformer was observed within the Project area. No evidence of staining, or leakage from the transformer was observed. Should transformer removal be required as part of the Project, the local utility company should be notified for proper testing and removal.
- Groundwater depth is anticipated to be near ground surface given the proximity to the San Dieguito River, San Dieguito Lagoon, and the Pacific Ocean. Dewatering of groundwater encountered during construction/excavation activities should adhere to regulatory compliance and permitting consistent with Regional Water Quality Control Board (RWQCB) and National Pollutant Discharge Elimination System (NPDES) requirements, and groundwater sampling should be conducted.
- Although not anticipated in other areas of the Project, should impacted soil (as evidenced by staining and/or odors) be encountered during construction activities, the Resident Engineer overseeing construction should stop work until a hazardous waste specialist is able to assess the soil for proper handling. It is recommended that the Caltrans Unknown Hazard Procedures be implemented during construction activities.
- At least two (2) natural gas transmission pipelines, and other utilities run parallel to, or cross the Project area indicating a potential hazard during construction. Coordination with local utility companies to avoid potential impacts is recommended prior to construction activities.

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Initial Site Assessment (ISA) Checklist

(continued)

ISA Conducted by:

_____ Date: July 2, 2021
Stefan Birardi
Staff Professional II

Reviewed by:

_____ Date: July 2, 2021
Margaret R. Carroll
Principal Professional

_____ Date: July 2, 2021
Lizanne Simmons
California Professional Geologist No. 7431

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APPENDIX B
ENVIRONMENTAL DATABASE REPORT

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Camino Del Mar Bridge Project
Del Mar
Solana Beach, CA 92075

Inquiry Number: 06515458.2r
June 01, 2021

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The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

DEL MAR
SOLANA BEACH, CA 92075

COORDINATES

Latitude (North):	32.9754230 - 32° 58' 31.52''
Longitude (West):	117.2690370 - 117° 16' 8.53''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	474860.1
UTM Y (Meters):	3648403.5
Elevation:	12 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5622846 DEL MAR OE W, CA
Version Date:	2012
Southeast Map:	5622814 DEL MAR, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140603
Source:	USDA

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MAPPED SITES SUMMARY

Target Property Address:
DEL MAR
SOLANA BEACH, CA 92075

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	STEVE PERRY	872 SOUTH SIERRA AVE	RCRA NonGen / NLR	Higher	1167, 0.221, NNW
A2	RENE MOHAMMED	842 S. SIERRA AVE	RCRA NonGen / NLR	Higher	1167, 0.221, NNW
A3	JOHN TATE	834 S SIERRA AVE	RCRA NonGen / NLR	Higher	1167, 0.221, NNW
A4	HEATHER ADAMS	802 SOUTH SIERRA	RCRA NonGen / NLR	Higher	1167, 0.221, NNW
B5	LINDA MAHER	157 S. SHORE DR.	RCRA NonGen / NLR	Higher	1255, 0.238, NNW
B6	RICHARD FRIEDMAN	851 BEACHFRONT DRIVE	RCRA NonGen / NLR	Higher	1276, 0.242, NNW
B7	MR AND MRS DOLAN	821 BEACH FRONT DR #	RCRA NonGen / NLR	Higher	1276, 0.242, NNW
8	DEL MAR THOROUGHBRED	DEL MAR RACE TRACK	SAN DIEGO CO. SAM, SAN DIEGO CO LOP	Higher	1381, 0.262, NE
C9	JOHN C READ CONSTRUC	2126 JIMMY DURANTE B	LUST, CPS-SLIC, Cortese, HIST CORTESE	Higher	1631, 0.309, SE
C10	JOHN REED CONSTRUCTI	2126 JIMMY DURANTE B	LUST, SAN DIEGO CO. SAM, CERS	Higher	1631, 0.309, SE
11	PROPOSED DEVELOPMENT	0 SOUTH CEDROS AVENU	CPS-SLIC, CERS	Higher	1782, 0.338, North
D12	DEL MAR THOROUGHBRED	2260 JIMMY DURANTE B	LUST, San Diego Co. HMMD, WDS, CERS	Higher	2398, 0.454, ESE
D13	PREMIER FOOD SERVICE	2260 JIMMY DURANTE B	LUST, SAN DIEGO CO. SAM, San Diego Co. HMMD,...	Higher	2398, 0.454, ESE
D14	DEL MAIR FAIR	2260 JIMMY DURANTE B	LUST	Higher	2398, 0.454, ESE
15	SAN DIEGUITO WETLAND	0 SAN DIEGUITO ROAD	CPS-SLIC, CERS	Lower	2485, 0.471, SE
16	DEL MAR THOROUGHBRED	DEL MAR RACE TRACK	LUST, CPS-SLIC, AST, SWEEPS UST, Cortese, CERS	Higher	2556, 0.484, ESE
E17	CAMP C.J. MILLER		FUDS	Higher	2761, 0.523, East
E18	CAMP C.J. MILLER		ENVIROSTOR	Higher	2767, 0.524, East
F19	NAVY DIRIGIBLE BASE		UXO	Higher	4962, 0.940, ESE
F20	NAVY DIRIGIBLE		ENVIROSTOR	Higher	4987, 0.945, ESE
21	ALLIANCE MINI-MART	1070 HIGHWAY 101	LUST, Cortese, ENF, HIST CORTESE, Notify 65, CERS	Higher	5042, 0.955, North

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EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System

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US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROLS..... Institutional Controls Sites List

Federal ERNS list

ERNS..... Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE..... State Response Sites

State and tribal landfill and/or solid waste disposal site lists

SWF/LF..... Solid Waste Information System

State and tribal leaking storage tank lists

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST..... Underground Storage Tank Listing
UST..... Active UST Facilities
AST..... Aboveground Petroleum Storage Tank Facilities
INDIAN UST..... Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP..... Voluntary Cleanup Priority Listing
VCP..... Voluntary Cleanup Program Properties

State and tribal Brownfields sites

BROWNFIELDS..... Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT..... Waste Management Unit Database
SWRCY..... Recycler Database
HAULERS..... Registered Waste Tire Haulers Listing
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands
ODI..... Open Dump Inventory
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL..... Delisted National Clandestine Laboratory Register

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HIST Cal-Sites	Historical Calsites Database
SCH	School Property Evaluation Program
CDL	Clandestine Drug Labs
San Diego Co. HMMD	Hazardous Materials Management Division Database
Toxic Pits	Toxic Pits Cleanup Act Sites
CERS HAZ WASTE	CERS HAZ WASTE
US CDL	National Clandestine Laboratory Register
PFAS	PFAS Contamination Site Location Listing

Local Lists of Registered Storage Tanks

SWEEPS UST	SWEEPS UST Listing
HIST UST	Hazardous Substance Storage Container Database
CA FID UST	Facility Inventory Database
CERS TANKS	California Environmental Reporting System (CERS) Tanks

Local Land Records

LIENS	Environmental Liens Listing
LIENS 2	CERCLA Lien Information
DEED	Deed Restriction Listing

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
CHMIRS	California Hazardous Material Incident Report System
LDS	Land Disposal Sites Listing
MCS	Military Cleanup Sites Listing
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data

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CONSENT Superfund (CERCLA) Consent Decrees
INDIAN RESERV Indian Reservations
FUSRAP Formerly Utilized Sites Remedial Action Program
UMTRA Uranium Mill Tailings Sites
LEAD SMELTERS Lead Smelter Sites
US AIRS Aerometric Information Retrieval System Facility Subsystem
US MINES Mines Master Index File
ABANDONED MINES Abandoned Mines
FINDS Facility Index System/Facility Registry System
DOCKET HWC Hazardous Waste Compliance Docket Listing
ECHO Enforcement & Compliance History Information
FUELS PROGRAM EPA Fuels Program Registered Listing
CA BOND EXP. PLAN Bond Expenditure Plan
CUPA Listings CUPA Resources List
DRYCLEANERS Cleaner Facilities
EMI Emissions Inventory Data
ENF Enforcement Action Listing
Financial Assurance Financial Assurance Information Listing
HAZNET Facility and Manifest Data
ICE ICE
HWP EnviroStor Permitted Facilities Listing
HWT Registered Hazardous Waste Transporter Database
MINES Mines Site Location Listing
MWMP Medical Waste Management Program Listing
NPDES NPDES Permits Listing
PEST LIC Pesticide Regulation Licenses Listing
PROC Certified Processors Database
UIC UIC Listing
UIC GEO UIC GEO (GEOTRACKER)
WASTEWATER PITS Oil Wastewater Pits Listing
WDS Waste Discharge System
WIP Well Investigation Program Case List
MILITARY PRIV SITES MILITARY PRIV SITES (GEOTRACKER)
PROJECT PROJECT (GEOTRACKER)
WDR Waste Discharge Requirements Listing
SAN DIEGO CO LOP Local Oversight Program Listing
CIWQS California Integrated Water Quality System
CERS CERS
NON-CASE INFO NON-CASE INFO (GEOTRACKER)
OTHER OIL GAS OTHER OIL & GAS (GEOTRACKER)
PROD WATER PONDS PROD WATER PONDS (GEOTRACKER)
SAMPLING POINT SAMPLING POINT (GEOTRACKER)
WELL STIM PROJ Well Stimulation Project (GEOTRACKER)
HWTS Hazardous Waste Tracking System
MINES MRDS Mineral Resources Data System

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP EDR Proprietary Manufactured Gas Plants
EDR Hist Auto EDR Exclusive Historical Auto Stations
EDR Hist Cleaner EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF Recovered Government Archive Solid Waste Facilities List

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EXECUTIVE SUMMARY

RGA LUST ---------- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent CERCLIS

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 01/25/2021 has revealed that there are 2 ENVIROSTOR sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CAMP C.J. MILLER Facility Id: 80000974 Status: Inactive - Needs Evaluation		E 1/2 - 1 (0.524 mi.)	E18	104
NAVY DIRIGIBLE Facility Id: 80000918 Status: Inactive - Needs Evaluation		ESE 1/2 - 1 (0.945 mi.)	F20	105

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there are 6 LUST sites within

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approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JOHN C READ CONSTRUC	***2126 JIMMY DURANTE B***	***SE 1/4 - 1/2 (0.309 mi.)***	***C9***	***28***
Database: LUST, Date of Government Version: 03/08/2021 Global Id: T0607300566 Status: Completed - Case Closed				
JOHN REED CONSTRUCTI	***2126 JIMMY DURANTE B***	***SE 1/4 - 1/2 (0.309 mi.)***	***C10***	***30***
Database: LUST REG 9, Date of Government Version: 03/01/2001 Closed Date: 9/22/95 Status: Case Closed Case Number: 9UT1776				
DEL MAR THOROUGHBRED	***2260 JIMMY DURANTE B***	***ESE 1/4 - 1/2 (0.454 mi.)***	***D12***	***33***
Database: LUST REG 9, Date of Government Version: 03/01/2001 Closed Date: 9/26/00 Status: Case Closed Case Number: 9UT2696 Case Number: 9UT756				
PREMIER FOOD SERVICE	***2260 JIMMY DURANTE B***	***ESE 1/4 - 1/2 (0.454 mi.)***	***D13***	***53***
Database: LUST, Date of Government Version: 03/08/2021 Global Id: T0607302352 Status: Completed - Case Closed				
DEL MAIR FAIR	2260 JIMMY DURANTE B	ESE 1/4 - 1/2 (0.454 mi.)	D14	95
Database: LUST REG 9, Date of Government Version: 03/01/2001 Closed Date: 10/12/00 Status: Case Closed Case Number: 9UT3584				
DEL MAR THOROUGHBRED	***DEL MAR RACE TRACK***	***ESE 1/4 - 1/2 (0.484 mi.)***	***16***	***97***
Database: LUST, Date of Government Version: 03/08/2021 Global Id: T0607301447 Global Id: T0607303013 Status: Completed - Case Closed				

SAN DIEGO CO. SAM: The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

A review of the SAN DIEGO CO. SAM list, as provided by EDR, and dated 03/23/2010 has revealed that there are 3 SAN DIEGO CO. SAM sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DEL MAR THOROUGHBRED	***DEL MAR RACE TRACK***	***NE 1/4 - 1/2 (0.262 mi.)***	***8***	***26***
Case Number: H04644-001 Case Number: H04644-002 Case Number: H04644-003 Facility Status: Closed Case				
JOHN REED CONSTRUCTI	***2126 JIMMY DURANTE B***	***SE 1/4 - 1/2 (0.309 mi.)***	***C10***	***30***
Case Number: H20144-001 Case Number: H20144-002 Facility Status: Closed Case				
PREMIER FOOD SERVICE	***2260 JIMMY DURANTE B***	***ESE 1/4 - 1/2 (0.454 mi.)***	***D13***	***53***

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EXECUTIVE SUMMARY

Case Number: H03436-001
Facility Status: Closed Case

CPS-SLIC: Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the CPS-SLIC list, as provided by EDR, has revealed that there are 4 CPS-SLIC sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JOHN C READ CONSTRUC	***2126 JIMMY DURANTE B***	***SE 1/4 - 1/2 (0.309 mi.)***	***C9***	***28***
Database: CPS-SLIC, Date of Government Version: 03/08/2021 Facility Status: Completed - Case Closed Global Id: T0608149274				
PROPOSED DEVELOPMENT	***0 SOUTH CEDROS AVENU***	***N 1/4 - 1/2 (0.338 mi.)***	***11***	***32***
Database: CPS-SLIC, Date of Government Version: 03/08/2021 Facility Status: Completed - Case Closed Global Id: T10000009124				
DEL MAR THOROUGHBRED	***DEL MAR RACE TRACK***	***ESE 1/4 - 1/2 (0.484 mi.)***	***16***	***97***
Database: CPS-SLIC, Date of Government Version: 03/08/2021 Facility Status: Completed - Case Closed Global Id: T0608135370				

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAN DIEGUITO WETLAND	***0 SAN DIEGUITO ROAD***	***SE 1/4 - 1/2 (0.471 mi.)***	***15***	***96***
Database: CPS-SLIC, Date of Government Version: 03/08/2021 Facility Status: Completed - Case Closed Global Id: T10000004144				

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ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/22/2021 has revealed that there are 7 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
STEVE PERRY EPA ID:: CAC003013944	872 SOUTH SIERRA AVE	NNW 1/8 - 1/4 (0.221 mi.)	A1	9
RENE MOHAMMED	842 S. SIERRA AVE	NNW 1/8 - 1/4 (0.221 mi.)	A2	11

EPA ID:: CAC002974364				
JOHN TATE EPA ID:: CAC003036055	834 S SIERRA AVE	NNW 1/8 - 1/4 (0.221 mi.)	A3	14
HEATHER ADAMS EPA ID:: CAC003058826	802 SOUTH SIERRA	NNW 1/8 - 1/4 (0.221 mi.)	A4	16
LINDA MAHER	157 S. SHORE DR.	NNW 1/8 - 1/4 (0.238 mi.)	B5	19
RICHARD FRIEDMAN EPA ID:: CAC003051171	851 BEACHFRONT DRIVE	NNW 1/8 - 1/4 (0.242 mi.)	B6	21
MR AND MRS DOLAN EPA ID:: CAC002968166	821 BEACH FRONT DR #	NNW 1/8 - 1/4 (0.242 mi.)	B7	24

FUDS: The Listing includes locations of Formerly Used Defense Sites Properties where the US Army Corps Of Engineers is actively working or will take necessary cleanup actions.

A review of the FUDS list, as provided by EDR, and dated 02/11/2021 has revealed that there is 1 FUDS site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CAMP C.J. MILLER		E 1/2 - 1 (0.523 mi.)	E17	103

UXO: A listing of unexploded ordnance site locations

A review of the UXO list, as provided by EDR, and dated 12/31/2018 has revealed that there is 1 UXO site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
NAVY DIRIGIBLE BASE		ESE 1/2 - 1 (0.940 mi.)	F19	105

Cortese: The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

A review of the Cortese list, as provided by EDR, and dated 12/17/2020 has revealed that there are 3 Cortese sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JOHN C READ CONSTRUC Cleanup Status: COMPLETED - CASE CLOSED	***2126 JIMMY DURANTE B***	***SE 1/4 - 1/2 (0.309 mi.)***	***C9***	***28***
PREMIER FOOD SERVICE Cleanup Status: COMPLETED - CASE CLOSED	***2260 JIMMY DURANTE B***	***ESE 1/4 - 1/2 (0.454 mi.)***	***D13***	***53***
DEL MAR THOROUGHBRED Cleanup Status: COMPLETED - CASE CLOSED	***DEL MAR RACE TRACK***	***ESE 1/4 - 1/2 (0.484 mi.)***	***16***	***97***

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EXECUTIVE SUMMARY

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 2 HIST CORTESE sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JOHN C READ CONSTRUC	***2126 JIMMY DURANTE B***	***SE 1/4 - 1/2 (0.309 mi.)***	***C9***	***28***
Reg Id: 9UT1776				
PREMIER FOOD SERVICE	***2260 JIMMY DURANTE B***	***ESE 1/4 - 1/2 (0.454 mi.)***	***D13***	***53***
Reg Id: 9UT2696				
Reg Id: 9UT3584				
Reg Id: 9UT756				

Notify 65: Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

A review of the Notify 65 list, as provided by EDR, and dated 12/07/2020 has revealed that there is 1 Notify 65 site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ALLIANCE MINI-MART	***1070 HIGHWAY 101***	***N 1/2 - 1 (0.955 mi.)***	***21***	***106***

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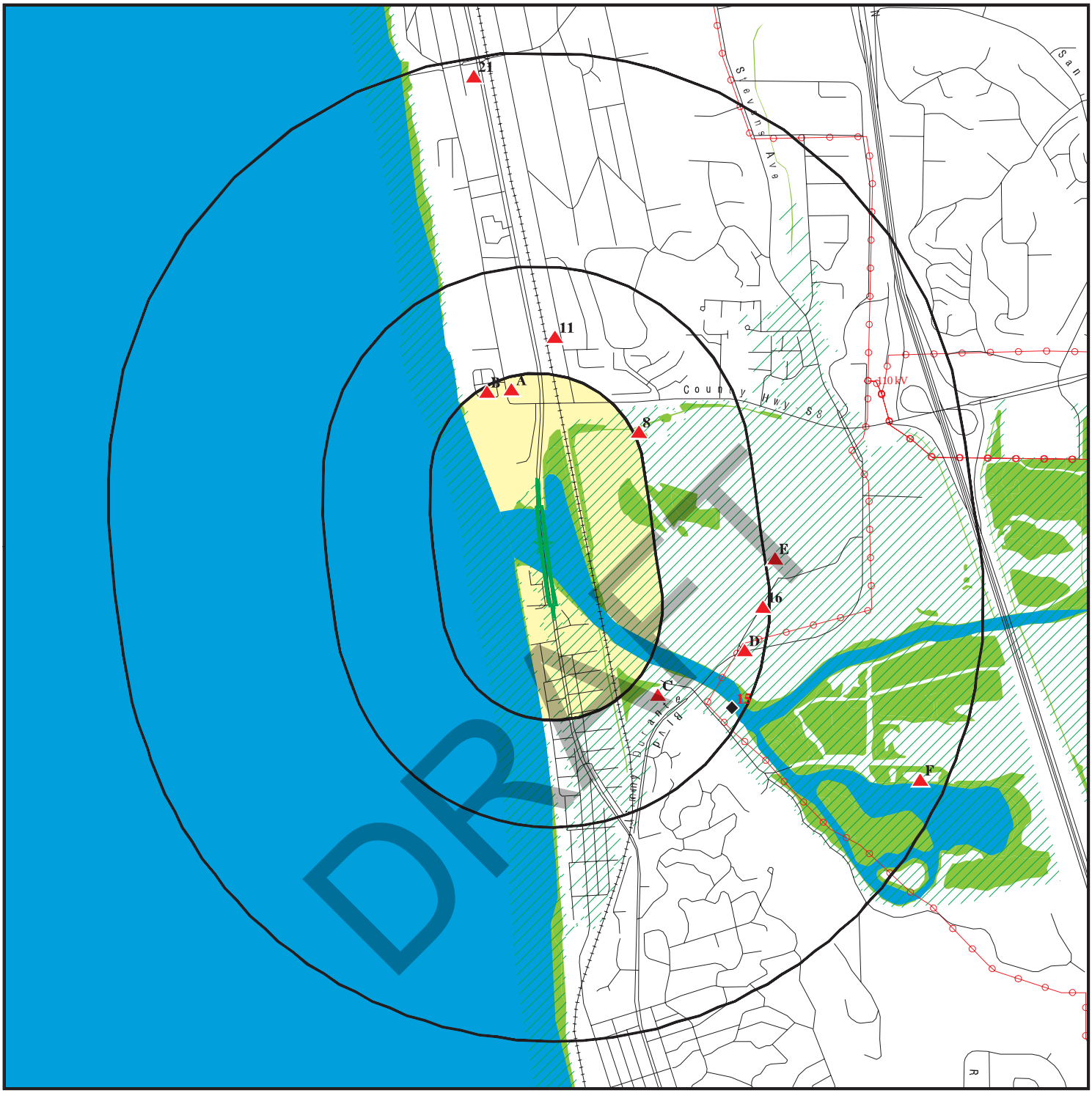
EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 6 records.

Site Name	Database(s)
SOUTHERN CALIFORNIA GAS LINE CO -	RCRA-LQG
SOUTHERN CALIFORNIA GAS LINE CO -	FINDS
CHINO NOJO INC	San Diego Co. HMMD
DEL MAR VEIN CARE	San Diego Co. HMMD
DEL MAR THOROUGHBRED CLUB	San Diego Co. HMMD
SOUTHERN CALIFORNIA GAS LINE CO -	ECHO

DRAFT

OVERVIEW MAP - 06515458.2R



0 1/4 1/2 1 Miles

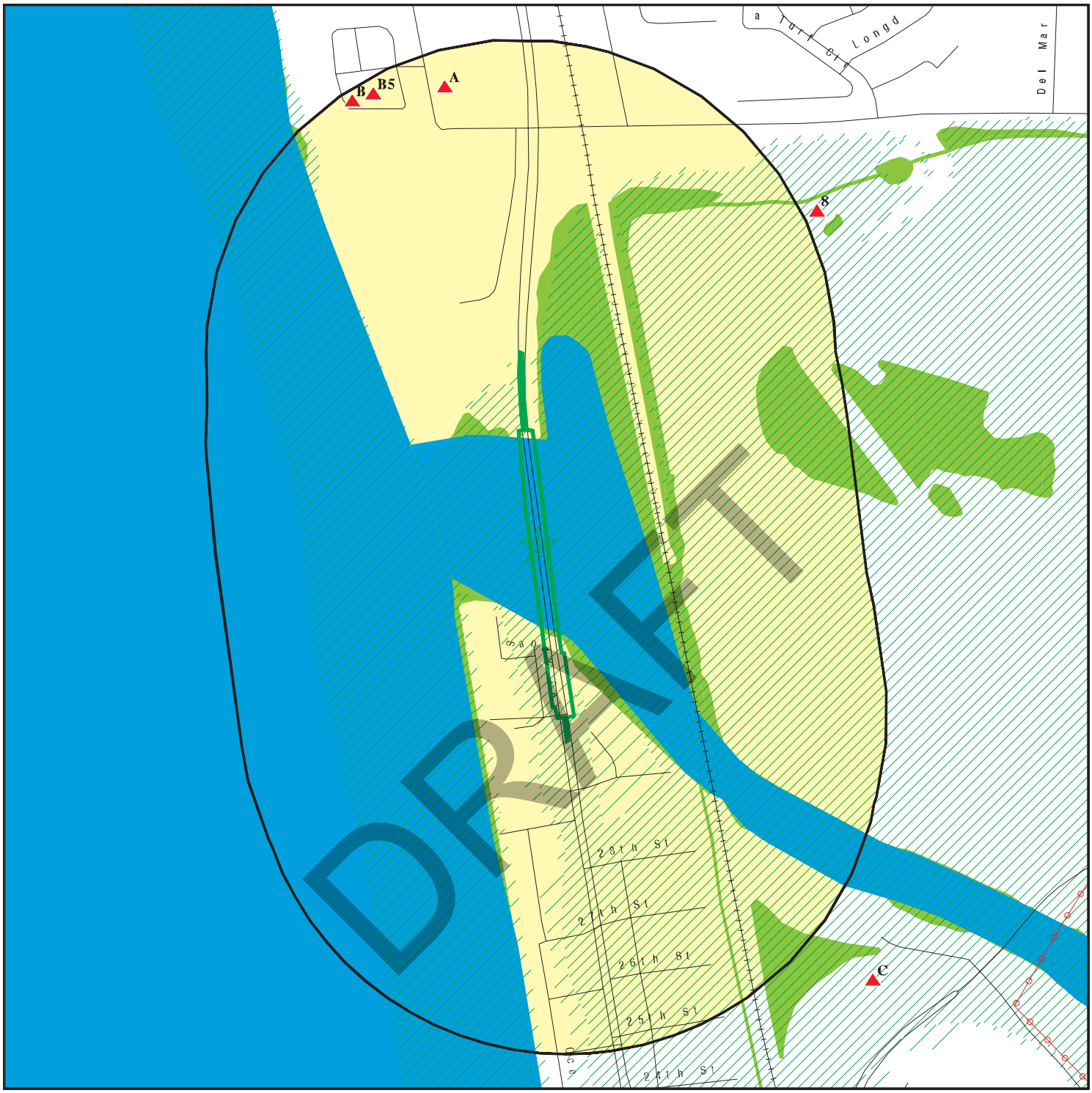
- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Camino Del Mar Bridge Project	CLIENT: Kleinfelder, Inc.
ADDRESS: Del Mar Solana Beach CA 92075	CONTACT: Stefan Birardi
LAT/LONG: 32.975423 / 117.269037	INQUIRY #: 06515458.2r DATE: June 01, 2021 10:24 am

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DETAIL MAP - 06515458.2R



0 1/16 1/8 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Camino Del Mar Bridge Project ADDRESS: Del Mar Solana Beach CA 92075 LAT/LONG: 32.975423 / 117.269037	CLIENT: Kleinfelder, Inc. CONTACT: Stefan Birardi INQUIRY #: 06515458.2r DATE: June 01, 2021 10:26 am

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS		TP	NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	2	NR	2
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	6	NR	NR	6

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SAN DIEGO CO. SAM	0.500		0	0	3	NR	NR	3
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	4	NR	NR	4
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
San Diego Co. HMMD	TP		NR	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
CERS HAZ WASTE	0.250		0	0	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
PFAS	0.500		0	0	0	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		0	0	NR	NR	NR	0
CERS TANKS	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	TP		NR	NR	NR	NR	NR	0

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LIENS 2	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	7	NR	NR	NR	7
FUDS	1.000		0	0	0	1	NR	1
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	1	NR	1
ECHO	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	3	NR	NR	3
CUPA Listings	0.250		0	0	NR	NR	NR	0

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0
ICE	TP		NR	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	2	NR	NR	2
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
PEST LIC	TP		NR	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	1	NR	1
UIC	TP		NR	NR	NR	NR	NR	0
UIC GEO	TP		NR	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	TP		NR	NR	NR	NR	NR	0
PROJECT	TP		NR	NR	NR	NR	NR	0
WDR	TP		NR	NR	NR	NR	NR	0
SAN DIEGO CO LOP	TP		NR	NR	NR	NR	NR	0
CIWQS	TP		NR	NR	NR	NR	NR	0
CERS	TP		NR	NR	NR	NR	NR	0
NON-CASE INFO	TP		NR	NR	NR	NR	NR	0
OTHER OIL GAS	TP		NR	NR	NR	NR	NR	0
PROD WATER PONDS	TP		NR	NR	NR	NR	NR	0
SAMPLING POINT	TP		NR	NR	NR	NR	NR	0
WELL STIM PROJ	TP		NR	NR	NR	NR	NR	0
HWTS	TP		NR	NR	NR	NR	NR	0
MINES MRDS	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		0	0	7	18	5	0	30

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

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A1
NNW
1/8-1/4
0.221 mi.
1167 ft.

STEVE PERRY
872 SOUTH SIERRA AVE
SOLANA BEACH, CA 92075

Site 1 of 4 in cluster A

RCRA NonGen / NLR | **1025834364** / **CAC003013944**

Relative:
Higher

Actual:
73 ft.

RCRA NonGen / NLR:

Date Form Received by Agency:		2019-05-07 00:00:00.0
Handler Name:	STEVE PERRY	
Handler Address:		872 SOUTH SIERRA AVE
Handler City,State,Zip:		SOLANA BEACH, CA 92075-2616
EPA ID:		CAC003013944
Contact Name:		STEVE PERRY
Contact Address:		872 SOUTH SIERRA AVE
Contact City,State,Zip:		SOLANA BEACH, CA 92075-2616
Contact Telephone:		801-874-8164
Contact Fax:		Not reported
Contact Email:		DANIELLEECKES@ALLIANCE-ENVIRO.COM
Contact Title:		Not reported
EPA Region:		09
Land Type:		Not reported
Federal Waste Generator Description:		Not a generator, verified
Non-Notifier:		Not reported
Biennial Report Cycle:		Not reported
Accessibility:		Not reported
Active Site Indicator:		Handler Activities
State District Owner:		Not reported
State District:		Not reported
Mailing Address:		872 SOUTH SIERRA AVE
Mailing City,State,Zip:		SOLANA BEACH, CA 92075-2616
Owner Name:		STEVE PERRY
Owner Type:		Other
Operator Name:		STEVE PERRY
Operator Type:		Other
Short-Term Generator Activity:		No
Importer Activity:		No
Mixed Waste Generator:		No
Transporter Activity:		No
Transfer Facility Activity:		No
Recycler Activity with Storage:		No
Small Quantity On-Site Burner Exemption:		No
Smelting Melting and Refining Furnace Exemption:		No
Underground Injection Control:		No
Off-Site Waste Receipt:		No
Universal Waste Indicator:		Yes
Universal Waste Destination Facility:		Yes
Federal Universal Waste:		No
Active Site Fed-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site Converter Treatment storage and Disposal Facility:		Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site State-Reg Handler:		---
Federal Facility Indicator:		Not reported
Hazardous Secondary Material Indicator:		N
Sub-Part K Indicator:		Not reported
Commercial TSD Indicator:		No
Treatment Storage and Disposal Type:		Not reported
2018 GPRA Permit Baseline:		Not on the Baseline
2018 GPRA Renewals Baseline:		Not on the Baseline
Permit Renewals Workload Universe:		Not reported

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STEVE PERRY (Continued) **1025834364**

Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	2019-06-27 11:34:48.0
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Operator
Owner/Operator Name:	STEVE PERRY
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	872 SOUTH SIERRA AVE
Owner/Operator City,State,Zip:	SOLANA BEACH, CA 92075-2616
Owner/Operator Telephone:	801-874-8164
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Owner
Owner/Operator Name:	STEVE PERRY
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	872 SOUTH SIERRA AVE
Owner/Operator City,State,Zip:	SOLANA BEACH, CA 92075-2616
Owner/Operator Telephone:	801-874-8164
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

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STEVE PERRY (Continued) **1025834364**

Historic Generators:
Receive Date: 2019-05-07 00:00:00.0
Handler Name: STEVE PERRY
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

A2 **RENE MOHAMMED** **RCRA NonGen / NLR** **1024754546**
NNW **842 S. SIERRA AVE** **CAC002974364**
1/8-1/4 **SOLANA BEACH, CA 92075**
0.221 mi.
1167 ft. **Site 2 of 4 in cluster A**

Relative: **Higher**

Actual: **73 ft.**

RCRA NonGen / NLR:
Date Form Received by Agency: 2018-08-06 00:00:00.0
Handler Name: RENE MOHAMMED
Handler Address: 842 S. SIERRA AVE
Handler City,State,Zip: SOLANA BEACH, CA 92075
EPA ID: CAC002974364
Contact Name: RENE MOHAMMED
Contact Address: 842 S. SIERRA AVE
Contact City,State,Zip: SOLANA BEACH, CA 92075
Contact Telephone: 858-625-0003
Contact Fax: Not reported
Contact Email: SDABATEMENT@GMAIL.COM
Contact Title: Not reported
EPA Region: 09
Land Type: Not reported
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: Handler Activities
State District Owner: Not reported
State District: Not reported
Mailing Address: 842 S. SIERRA AVE
Mailing City,State,Zip: SOLANA BEACH, CA 92075
Owner Name: RENE MOHAMMED

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RENE MOHAMMED (Continued) **1024754546**

Owner Type:	Other
Operator Name:	RENE MOHAMMED
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	Yes
Universal Waste Destination Facility:	Yes
Federal Universal Waste:	No
Active Site Fed-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site Converter Treatment storage and Disposal Facility:	Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
Commercial TSD Indicator:	No
Treatment Storage and Disposal Type:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
Permit Renewals Workload Universe:	Not reported
Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	2018-08-31 17:14:19.0
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No

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RENE MOHAMMED (Continued) **1024754546**

Sub-Part P Indicator: No

Handler - Owner Operator:
Owner/Operator Indicator: Owner
Owner/Operator Name: RENE MOHAMMED
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 842 S. SIERRA AVE
Owner/Operator City,State,Zip: SOLANA BEACH, CA 92075
Owner/Operator Telephone: 858-625-0003
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator
Owner/Operator Name: RENE MOHAMMED
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 842 S. SIERRA AVE
Owner/Operator City,State,Zip: SOLANA BEACH, CA 92075
Owner/Operator Telephone: 858-625-0003
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 2018-08-06 00:00:00.0
Handler Name: RENE MOHAMMED
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

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A3 **JOHN TATE** **RCRA NonGen / NLR** **1025855770**
NNW **834 S SIERRA AVE** **CAC003036055**
1/8-1/4 **SOLANA BEACH, CA 92075**
0.221 mi.
1167 ft. **Site 3 of 4 in cluster A**

Relative: **Higher**
Actual: **73 ft.**

RCRA NonGen / NLR:

Date Form Received by Agency:		2019-09-27 00:00:00.0
Handler Name:	JOHN TATE	
Handler Address:		834 S SIERRA AVE
Handler City,State,Zip:		SOLANA BEACH, CA 92075-2616
EPA ID:		CAC003036055
Contact Name:		JOHN TATE
Contact Address:		834 S SIERRA AVE
Contact City,State,Zip:		SOLANA BEACH, CA 92075-2616
Contact Telephone:		714-362-5481
Contact Fax:		Not reported
Contact Email:		DANIELLEECKES@ALLIANCE-ENVIRO.COM
Contact Title:		Not reported
EPA Region:		09
Land Type:		Not reported
Federal Waste Generator Description:		Not a generator, verified
Non-Notifier:		Not reported
Biennial Report Cycle:		Not reported
Accessibility:		Not reported
Active Site Indicator:		Not reported
State District Owner:		Not reported
State District:		Not reported
Mailing Address:		834 S SIERRA AVE
Mailing City,State,Zip:		SOLANA BEACH, CA 92075-2616
Owner Name:		JOHN TATE
Owner Type:		Other
Operator Name:		JOHN TATE
Operator Type:		Other
Short-Term Generator Activity:		No
Importer Activity:		No
Mixed Waste Generator:		No
Transporter Activity:		No
Transfer Facility Activity:		No
Recycler Activity with Storage:		No
Small Quantity On-Site Burner Exemption:		No
Smelting Melting and Refining Furnace Exemption:		No
Underground Injection Control:		No
Off-Site Waste Receipt:		No
Universal Waste Indicator:		No
Universal Waste Destination Facility:		No
Federal Universal Waste:		No
Active Site Fed-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site Converter Treatment storage and Disposal Facility:		Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site State-Reg Handler:		---
Federal Facility Indicator:		Not reported
Hazardous Secondary Material Indicator:		N
Sub-Part K Indicator:		Not reported
Commercial TSD Indicator:		No
Treatment Storage and Disposal Type:		Not reported
2018 GPRA Permit Baseline:		Not on the Baseline
2018 GPRA Renewals Baseline:		Not on the Baseline
Permit Renewals Workload Universe:		Not reported

DRAFT

JOHN TATE (Continued) **1025855770**

Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	2019-10-04 16:30:44.0
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name:	JOHN TATE
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	834 S SIERRA AVE
Owner/Operator City,State,Zip:	SOLANA BEACH, CA 92075-2616
Owner/Operator Telephone:	714-362-5481
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name:	JOHN TATE
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	834 S SIERRA AVE
Owner/Operator City,State,Zip:	SOLANA BEACH, CA 92075-2616
Owner/Operator Telephone:	714-362-5481
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

DRAFT

JOHN TATE (Continued) **1025855770**

Historic Generators:
Receive Date: 2019-09-27 00:00:00.0
Handler Name: JOHN TATE
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

A4 **HEATHER ADAMS** **RCRA NonGen / NLR** **1026051935**
NNW **802 SOUTH SIERRA** **CAC003058826**
1/8-1/4 **SOLANA BEACH, CA 92075**
0.221 mi.
1167 ft. **Site 4 of 4 in cluster A**

Relative: **Higher**
Actual: **73 ft.**

RCRA NonGen / NLR:
Date Form Received by Agency: 2020-03-05 00:00:00.0
Handler Name: HEATHER ADAMS
Handler Address: 802 SOUTH SIERRA
Handler City,State,Zip: SOLANA BEACH, CA 92075
EPA ID: CAC003058826
Contact Name: HEATHER ADAMS
Contact Address: 802 SOUTH SIERRA
Contact City,State,Zip: SOLANA BEACH, CA 92075
Contact Telephone: 408-816-0418
Contact Fax: Not reported
Contact Email: VANESSAPIZARRO@ALLIANCE-ENVIRO.COM
Contact Title: Not reported
EPA Region: 09
Land Type: Not reported
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: Not reported
State District Owner: Not reported
State District: Not reported
Mailing Address: 802 SOUTH SIERRA
Mailing City,State,Zip: SOLANA BEACH, CA 92075
Owner Name: HEATHER ADAMS

DRAFT

HEATHER ADAMS (Continued) **1026051935**

Owner Type:	Other
Operator Name:	HEATHER ADAMS
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site Fed-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site Converter Treatment storage and Disposal Facility:	Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
Commercial TSD Indicator:	No
Treatment Storage and Disposal Type:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
Permit Renewals Workload Universe:	Not reported
Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	2020-03-06 18:11:34.0
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No

DRAFT

HEATHER ADAMS (Continued) **1026051935**

Sub-Part P Indicator: No

Handler - Owner Operator:
Owner/Operator Indicator: Operator
Owner/Operator Name: HEATHER ADAMS
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 802 SOUTH SIERRA
Owner/Operator City,State,Zip: SOLANA BEACH, CA 92075
Owner/Operator Telephone: 408-816-0418
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: HEATHER ADAMS
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 802 SOUTH SIERRA
Owner/Operator City,State,Zip: SOLANA BEACH, CA 92075
Owner/Operator Telephone: 408-816-0418
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 2020-03-05 00:00:00.0
Handler Name: HEATHER ADAMS
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

DRAFT

B5 **LINDA MAHER** **RCRA NonGen / NLR** **1026710043**
NNW **157 S. SHORE DR.** **CAC003098161**
1/8-1/4 **SOLANA BEACH, CA 92075**
0.238 mi.
1255 ft. **Site 1 of 3 in cluster B**

Relative: **Higher**

Actual: **80 ft.**

RCRA NonGen / NLR:

Date Form Received by Agency:		2020-12-22 00:00:00.0
Handler Name:	LINDA MAHER	
Handler Address:		157 S. SHORE DR.
Handler City,State,Zip:		SOLANA BEACH, CA 92075
EPA ID:		CAC003098161
Contact Name:		LINDA MAHER
Contact Address:		157 S. SHORE DR.
Contact City,State,Zip:		SOLANA BEACH, CA 92075
Contact Telephone:		818-681-8645
Contact Fax:		Not reported
Contact Email:		SDABATEMENT@GMAIL.COM
Contact Title:		Not reported
EPA Region:		09
Land Type:		Not reported
Federal Waste Generator Description:		Not a generator, verified
Non-Notifier:		Not reported
Biennial Report Cycle:		Not reported
Accessibility:		Not reported
Active Site Indicator:		Not reported
State District Owner:		Not reported
State District:		Not reported
Mailing Address:		157 S. SHORE DR.
Mailing City,State,Zip:		SOLANA BEACH, CA 92075
Owner Name:		LINDA MAHER
Owner Type:		Other
Operator Name:		LINDA MAHER
Operator Type:		Other
Short-Term Generator Activity:		No
Importer Activity:		No
Mixed Waste Generator:		No
Transporter Activity:		No
Transfer Facility Activity:		No
Recycler Activity with Storage:		No
Small Quantity On-Site Burner Exemption:		No
Smelting Melting and Refining Furnace Exemption:		No
Underground Injection Control:		No
Off-Site Waste Receipt:		No
Universal Waste Indicator:		No
Universal Waste Destination Facility:		No
Federal Universal Waste:		No
Active Site Fed-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site Converter Treatment storage and Disposal Facility:		Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site State-Reg Handler:		---
Federal Facility Indicator:		Not reported
Hazardous Secondary Material Indicator:		N
Sub-Part K Indicator:		Not reported
Commercial TSD Indicator:		No
Treatment Storage and Disposal Type:		Not reported
2018 GPRA Permit Baseline:		Not on the Baseline
2018 GPRA Renewals Baseline:		Not on the Baseline
Permit Renewals Workload Universe:		Not reported

DRAFT

LINDA MAHER (Continued) **1026710043**

Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	2021-02-26 18:43:38.0
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Operator
Owner/Operator Name:	LINDA MAHER
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	157 S. SHORE DR.
Owner/Operator City,State,Zip:	SOLANA BEACH, CA 92075
Owner/Operator Telephone:	818-681-8645
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Owner
Owner/Operator Name:	LINDA MAHER
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	157 S. SHORE DR.
Owner/Operator City,State,Zip:	SOLANA BEACH, CA 92075
Owner/Operator Telephone:	818-681-8645
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

DRAFT

LINDA MAHER (Continued) **1026710043**

Historic Generators:
Receive Date: 2020-12-22 00:00:00.0
Handler Name: LINDA MAHER
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

B6 **RICHARD FRIEDMAN** **RCRA NonGen / NLR** **1026044833**
NNW **851 BEACHFRONT DRIVE** **CAC003051171**
1/8-1/4 **SOLANA BEACH, CA 92075**
0.242 mi.
1276 ft. **Site 2 of 3 in cluster B**

Relative: **Higher**
Actual: **83 ft.**

RCRA NonGen / NLR:
Date Form Received by Agency: 2020-01-15 00:00:00.0
Handler Name: RICHARD FRIEDMAN
Handler Address: 851 BEACHFRONT DRIVE
Handler City,State,Zip: SOLANA BEACH, CA 92075
EPA ID: CAC003051171
Contact Name: RICHARD FRIEDMAN
Contact Address: 851 BEACHFRONT DRIVE
Contact City,State,Zip: SOLANA BEACH, CA 92075
Contact Telephone: 858-354-8811
Contact Fax: Not reported
Contact Email: DANIELLEECKES@ALLIANCE-ENVIRO.COM
Contact Title: Not reported
EPA Region: 09
Land Type: Not reported
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: Not reported
State District Owner: Not reported
State District: Not reported
Mailing Address: 851 BEACHFRONT DRIVE
Mailing City,State,Zip: SOLANA BEACH, CA 92075
Owner Name: RICHARD FRIEDMAN

DRAFT

RICHARD FRIEDMAN (Continued) **1026044833**

Owner Type:	Other
Operator Name:	RICHARD FRIEDMAN
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site Fed-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site Converter Treatment storage and Disposal Facility:	Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
Commercial TSD Indicator:	No
Treatment Storage and Disposal Type:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
Permit Renewals Workload Universe:	Not reported
Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	2020-02-10 17:52:38.0
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No

DRAFT

RICHARD FRIEDMAN (Continued) **1026044833**

Sub-Part P Indicator: No

Handler - Owner Operator:
Owner/Operator Indicator: Owner
Owner/Operator Name: RICHARD FRIEDMAN
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 851 BEACHFRONT DRIVE
Owner/Operator City,State,Zip: SOLANA BEACH, CA 92075
Owner/Operator Telephone: 858-354-8811
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator
Owner/Operator Name: RICHARD FRIEDMAN
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 851 BEACHFRONT DRIVE
Owner/Operator City,State,Zip: SOLANA BEACH, CA 92075
Owner/Operator Telephone: 858-354-8811
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 2020-01-15 00:00:00.0
Handler Name: RICHARD FRIEDMAN
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

DRAFT

B7 **MR AND MRS DOLAN** **RCRA NonGen / NLR** **1024748387**
NNW **821 BEACH FRONT DR #A** **CAC002968166**
1/8-1/4 **SOLANA BEACH, CA 92075**
0.242 mi.
1276 ft. **Site 3 of 3 in cluster B**

Relative: **Higher**
Actual: **83 ft.**

RCRA NonGen / NLR:

Date Form Received by Agency:		2018-06-26 00:00:00.0
Handler Name:	MR AND MRS DOLAN	
Handler Address:		821 BEACH FRONT DR #A
Handler City,State,Zip:		SOLANA BEACH, CA 92075
EPA ID:		CAC002968166
Contact Name:		MR AND MRS DOLAN
Contact Address:		821 BEACH FRONT DR #A
Contact City,State,Zip:		SOLANA BEACH, CA 92075
Contact Telephone:		760-803-2582
Contact Fax:		Not reported
Contact Email:		SDABATEMENT@GMAIL.COM
Contact Title:		Not reported
EPA Region:		09
Land Type:		Not reported
Federal Waste Generator Description:		Not a generator, verified
Non-Notifier:		Not reported
Biennial Report Cycle:		Not reported
Accessibility:		Not reported
Active Site Indicator:		Handler Activities
State District Owner:		Not reported
State District:		Not reported
Mailing Address:		821 BEACH FRONT DR #A
Mailing City,State,Zip:		SOLANA BEACH, CA 92075
Owner Name:		MR AND MRS DOLAN
Owner Type:		Other
Operator Name:		MR AND MRS DOLAN
Operator Type:		Other
Short-Term Generator Activity:		No
Importer Activity:		No
Mixed Waste Generator:		No
Transporter Activity:		No
Transfer Facility Activity:		No
Recycler Activity with Storage:		No
Small Quantity On-Site Burner Exemption:		No
Smelting Melting and Refining Furnace Exemption:		No
Underground Injection Control:		No
Off-Site Waste Receipt:		No
Universal Waste Indicator:		Yes
Universal Waste Destination Facility:		Yes
Federal Universal Waste:		No
Active Site Fed-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site Converter Treatment storage and Disposal Facility:		Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site State-Reg Handler:		---
Federal Facility Indicator:		Not reported
Hazardous Secondary Material Indicator:		N
Sub-Part K Indicator:		Not reported
Commercial TSD Indicator:		No
Treatment Storage and Disposal Type:		Not reported
2018 GPRA Permit Baseline:		Not on the Baseline
2018 GPRA Renewals Baseline:		Not on the Baseline
Permit Renewals Workload Universe:		Not reported

DRAFT

MR AND MRS DOLAN (Continued) **1024748387**

Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	2018-08-31 17:14:28.0
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Operator
Owner/Operator Name:	MR AND MRS DOLAN
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	821 BEACH FRONT DR #A
Owner/Operator City,State,Zip:	SOLANA BEACH, CA 92075
Owner/Operator Telephone:	760-803-2582
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Owner
Owner/Operator Name:	MR AND MRS DOLAN
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	821 BEACH FRONT DR #A
Owner/Operator City,State,Zip:	SOLANA BEACH, CA 92075
Owner/Operator Telephone:	760-803-2582
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

DRAFT

MR AND MRS DOLAN (Continued) **1024748387**

Historic Generators:
Receive Date: 2018-06-26 00:00:00.0
Handler Name: MR AND MRS DOLAN
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

8
NE
1/4-1/2
0.262 mi.
1381 ft.

DEL MAR THOROUGHBRED CLUB **SAN DIEGO CO. SAM** **S108407025**
DEL MAR RACE TRACK **SAN DIEGO CO LOP** **N/A**
DEL MAR, CA 92014

Relative:
Higher

Actual:
12 ft.

SAN DIEGO CO. SAM:
Name: DEL MAR THOROUGHBRED CLUB
Address: DEL MAR RACE TRACK
City,State,Zip: DEL MAR, CA 92014
Case Number: H04644-001
Agency: DEH Site Assessment & Mitigation
Funding: **LOP - Federal Fund**
Facility Type: GW With No Beneficial Use Designation
Facility Status: Closed Case
Date: 9/26/2000
Date Began: 7/1/1987

Name: DEL MAR THOROUGHBRED CLUB
Address: DEL MAR RACE TRACK
City,State,Zip: DEL MAR, CA 92014
Case Number: H04644-002
Agency: DEH Site Assessment & Mitigation
Funding: **Non Billable**
Facility Type: Failed Integrity Test
Facility Status: Closed Case
Date: 4/27/1990
Date Began: 3/1/1990

Name: DEL MAR THOROUGHBRED CLUB
Address: DEL MAR RACE TRACK

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S108407025**

City,State,Zip:	DEL MAR, CA 92014
Case Number:	H04644-003
Agency:	DEH Site Assessment & Mitigation
Funding:	**LOP - Federal Fund**
Facility Type:	Drinking Water Aquifer Impacted
Facility Status:	Closed Case
Date:	9/26/2000
Date Began:	7/6/1993

SAN DIEGO CO LOP:

Name:	DEL MAR THOROUGHBRED CLUB
Address:	DEL MAR RACE TRACK
City,State,Zip:	DEL MAR, CA 92014
Record ID:	DEH1990-LSAM-H04644-002
Record Status:	Completed
Opened Date:	03/16/1990
Parcel Number:	298-421-08-00
Case Type:	FIT - Failed Integrity Test
Historical Name:	DEL MAR THOROUGHBRED CLUB
SWRCB Global ID:	T0608135370
Funding:	N - Non-Billable
Lead Agency:	DEH/SAM
Lead Agency Date:	03/19/1990
Census Tract:	172.00
Community:	Del Mar
Jurisdiction:	DEL MAR
Watershed Basin Number:	905.11
Water Purveyor:	CWA SANTA FE IRRIGATION DIST
Fire Agency:	DEL MAR
Latitude:	32.9792922
Longitude:	-117.2652050
X MapCoord:	6250339.044
Y MapCoord:	1937654.970

Name:	DEL MAR THOROUGHBRED CLUB
Address:	DEL MAR RACE TRACK
City,State,Zip:	DEL MAR, CA 92014
Record ID:	DEH1987-LSAM-H04644-001
Record Status:	Completed
Opened Date:	07/09/1987
Parcel Number:	298-421-08-00
Case Type:	LOP - Local Oversight Program
Historical Name:	DEL MAR THOROUGHBRED CLUB
SWRCB Global ID:	T0607303013
Funding:	F - LOP Federal Fund
Lead Agency:	DEH/SAM
Lead Agency Date:	03/29/1989
Census Tract:	172.00
Community:	Del Mar
Jurisdiction:	DEL MAR
Watershed Basin Number:	905.11
Water Purveyor:	CWA SANTA FE IRRIGATION DIST
Fire Agency:	DEL MAR
Latitude:	32.9792922
Longitude:	-117.2652050
X MapCoord:	6250339.044
Y MapCoord:	1937654.970

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S108407025**

Name:	DEL MAR THOROUGHBRED CLUB
Address:	DEL MAR RACE TRACK
City,State,Zip:	DEL MAR, CA 92014
Record ID:	DEH1993-LSAM-H04644-003
Record Status:	Completed
Opened Date:	07/06/1993
Parcel Number:	298-421-08-00
Case Type:	LOP - Local Oversight Program
Historical Name:	DEL MAR THOROUGHBRED CLUB
SWRCB Global ID:	T0607301447
Funding:	F - LOP Federal Fund
Lead Agency:	DEH/SAM
Lead Agency Date:	07/06/1993
Census Tract:	172.00
Community:	Del Mar
Jurisdiction:	DEL MAR
Watershed Basin Number:	905.11
Water Purveyor:	CWA SANTA FE IRRIGATION DIST
Fire Agency:	DEL MAR
Latitude:	32.9792922
Longitude:	-117.2652050
X MapCoord:	6250339.044
Y MapCoord:	1937654.970

C9 **JOHN C READ CONSTRUCTION CO** **LUST** **S104749381**
SE **2126 JIMMY DURANTE BL** **CPS-SLIC** **N/A**
1/4-1/2 **DEL MAR, CA 92014** **Cortese**
0.309 mi. **HIST CORTESE**
1631 ft. **Site 1 of 2 in cluster C**

Relative: Higher
Actual: 16 ft.

LUST:

Name:	JOHN C READ CONSTRUCTION CO
Address:	2126 JIMMY DURANTE BL
City,State,Zip:	DEL MAR, CA 920142215
Lead Agency:	SAN DIEGO COUNTY LOP
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0607300566
Global Id:	T0607300566
Latitude:	32.970348
Longitude:	-117.264447
Status:	Completed - Case Closed
Status Date:	09/22/1995
Case Worker:	Not reported
RB Case Number:	9UT1776
Local Agency:	Not reported
File Location:	Local Agency
Local Case Number:	H20144-001
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

LUST:

Global Id:	T0607300566
Action Type:	Other
Date:	07/28/1988
Action:	Leak Began
Global Id:	T0607300566

DRAFT

JOHN C READ CONSTRUCTION CO (Continued) **S104749381**

Action Type: Other
Date: 07/28/1988
Action: Leak Discovery

Global Id: T0607300566
Action Type: Other
Date: 08/02/1990
Action: Leak Stopped

Global Id: T0607300566
Action Type: Other
Date: 07/28/1988
Action: Leak Reported

Global Id: T0607300566
Action Type: ENFORCEMENT
Date: 08/17/1992
Action: Notice of Responsibility

LUST:
Global Id: T0607300566
Status: Open - Case Begin Date
Status Date: 07/28/1988

Global Id: T0607300566
Status: Completed - Case Closed
Status Date: 09/22/1995

CPS-SLIC:
Name: JOHN C READ CONSTRUCTION CO
Address: 2126 JIMMY DURANTE BL
City,State,Zip: DEL MAR, CA 920142215
Region: STATE
Facility Status: **Completed - Case Closed**
Status Date: 08/17/1988
Global Id: T0608149274
Lead Agency: SAN DIEGO COUNTY LOP
Lead Agency Case Number: H20144-002
Latitude: 32.970382
Longitude: -117.264474
Case Type: Cleanup Program Site
Case Worker: Not reported
Local Agency: Not reported
RB Case Number: Not reported
File Location: Local Agency
Potential Media Affected: Not reported
Potential Contaminants of Concern: Not reported
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

CORTESE:
Name: JOHN C READ CONSTRUCTION CO
Address: 2126 JIMMY DURANTE BL
City,State,Zip: DEL MAR, CA 920142215

DRAFT

JOHN C READ CONSTRUCTION CO (Continued) **S104749381**

Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	T0607300566
Site/Facility Type:	LUST CLEANUP SITE
Cleanup Status:	COMPLETED - CASE CLOSED
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	active
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Active Open

HIST CORTESE:

edr_fname:	JOHN REED CONSTRUCTION
edr_fadd1:	2126 JIMMY DURANTE
City,State,Zip:	DEL MAR, CA 92014
Region:	CORTESE
Facility County Code:	37
Reg By:	LTNKA
Reg Id:	9UT1776

C10 **JOHN REED CONSTRUCTION** **LUST** **S101301513**
SE **2126 JIMMY DURANTE BLVD** **SAN DIEGO CO. SAM** **N/A**
1/4-1/2 **DEL MAR, CA 92014** **CERS**
0.309 mi.
1631 ft. **Site 2 of 2 in cluster C**

Relative:
Higher

Actual:
16 ft.

LUST REG 9:

Region:	9
Status:	Case Closed
Case Number:	9UT1776
Local Case:	H20144-001
Substance:	Unleaded Gasoline
Qty Leaked:	0
Abate Method:	Excavate and Dispose - remove contaminated soil and dispose in approved site
Local Agency:	San Diego
How Found:	Tank Closure
How Stopped:	Close Tank
Source:	Tank
Cause:	Unknown
Lead Agency:	Local Agency
Case Type:	Other ground water affected
Date Found:	07/25/1990
Date Stopped:	07/25/1990
Confirm Date:	08/20/1990
Submit Workplan:	Not reported

DRAFT

JOHN REED CONSTRUCTION (Continued) **S101301513**

Prelim Assess: 08/17/1988
Desc Pollution: Not reported
Remed Plan: / /
Remed Action: Not reported
Began Monitor: Not reported
Release Date: 07/25/1990
Enforce Date: Not reported
Closed Date: 9/22/95
Enforce Type: Not reported
Pilot Program: LOP
Basin Number: 905.11
GW Depth: 6.2'
Beneficial Use: NBNB/E
NPDES Number: Not reported
Priority: 1C
File Dispn: File discarded, case closed
Interim Remedial Actions: Yes
Cleanup and Abatement order Number: Not reported
Waste Discharge Requirement Number: Not reported

SAN DIEGO CO. SAM:

Name: JOHN C READ CONSTRUCTION CO
Address: 2126 JIMMY DURANTE BL
City,State,Zip: DEL MAR, CA 920142215
Case Number: H20144-001
Agency: DEH Site Assessment & Mitigation
Funding: **LOP - Federal Fund**
Facility Type: GW With No Beneficial Use Designation
Facility Status: Closed Case
Date: 9/22/1995
Date Began: 7/28/1988

Name: JOHN C READ CONSTRUCTION CO
Address: 2126 JIMMY DURANTE BL
City,State,Zip: DEL MAR, CA 920142215
Case Number: H20144-002
Agency: DEH Site Assessment & Mitigation
Funding: **Non Billable**
Facility Type: Failed Integrity Test
Facility Status: Closed Case
Date: 8/17/1988
Date Began: 7/28/1988

CERS:

Name: JOHN C READ CONSTRUCTION CO
Address: 2126 JIMMY DURANTE BL
City,State,Zip: DEL MAR, CA 920142215
Site ID: 227752
CERS ID: T0608149274
CERS Description: Cleanup Program Site

Name: JOHN C READ CONSTRUCTION CO
Address: 2126 JIMMY DURANTE BL
City,State,Zip: DEL MAR, CA 920142215
Site ID: 227752
CERS ID: T0607300566

DRAFT

JOHN REED CONSTRUCTION (Continued) **S101301513**

CERS Description: Leaking Underground Storage Tank Cleanup Site

---

11
North
1/4-1/2
0.338 mi.
1782 ft.

PROPOSED DEVELOPMENT
0 SOUTH CEDROS AVENUE
SOLANA BEACH, CA 92075

CPS-SLIC **S118822745**
CERS **N/A**

Relative:
Higher

Actual:
95 ft.

CPS-SLIC:

Name:	PROPOSED DEVELOPMENT
Address:	0 SOUTH CEDROS AVENUE
City,State,Zip:	SOLANA BEACH, CA 92075
Region:	STATE
Facility Status:	**Completed - Case Closed**
Status Date:	06/15/2017
Global Id:	T10000009124
Lead Agency:	SAN DIEGO COUNTY LOP
Lead Agency Case Number:	DEH2016-LSAM-000381
Latitude:	32.982507168304
Longitude:	-117.268578456345
Case Type:	Cleanup Program Site
Case Worker:	EM
Local Agency:	SAN DIEGO COUNTY LOP
RB Case Number:	Not reported
File Location:	Not reported
Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Not reported
Site History:	This VAP case was opened to evaluate any subsurface contamination for this site for redevelopment of the vacant lot into three residential units. A June 24, 2016, Property Mitigation Plan (PMP) discussed soil samples taken on September 11, 2014 from six test pits at 1-foot, 1.5-foot and 3-foot depths. Test Pits (TP) #1 - #4 revealed small amounts of Contaminants of Potential Concern (COPCs), mostly hydrocarbons in the diesel and oil range. The highest COPC in soil was diesel at 103.2 mg/kg. Volatile Organic Compounds (including chlorinated compounds), lead and pesticides were not noted above reporting limits. A second sampling event occurred on May 12, 2016 with four hand borings located at the areas of TP1- TP 4. The PMP proposed burial of diesel and oil impacted soil under two feet of the lowest planed surface grade or six inches to two feet below utility / foundation excavations, and not in areas where retention basins or pools could be constructed. Alternatively, soils could be disposed at a landfill, disposal facility or offsite reuse per Regional Water Quality Control Board, Region 9, Conditional Waiver 10 of Order R9-2014-0041. The PMP and Community Health & Safety Plan (CHSP) were approved. Excavation of the property occurred from December 20, 2016 through April 4, 2017. Confirmation samples revealed all impacted soil had been removed for onsite reuse. No additional stained or contaminated soil was noted during the excavation. Approximately 3,400 cubic yards (about 1,700 cubic yards considered impacted) were excavated of which all was reused on site as cut and fill amounts were balanced. Impacted soil noted during earlier assessment was placed under at least two feet of the lowest planed surface grade or six inches to two feet below utility / foundation excavations per approved PMP. In addition, the impacted soil was not placed within five feet of any biobasins. Based on the placement of impacted soil and the nature of the COPCs (primarily diesel and oil), the consultant concludes that there is a negligible to nil risk to human

DRAFT

PROPOSED DEVELOPMENT (Continued) **S118822745**

health and the environment to include surface water runoff and groundwater. DEH concurs with these conclusions.

Click here to access the California GeoTracker records for this facility:

CERS:

Name:	PROPOSED DEVELOPMENT
Address:	0 SOUTH CEDROS AVENUE
City,State,Zip:	SOLANA BEACH, CA 92075
Site ID:	374706
CERS ID:	T10000009124
CERS Description:	Cleanup Program Site

Affiliation:

Affiliation Type Desc:	Local Agency Caseworker
Entity Name:	EWAN MOFFAT - SAN DIEGO COUNTY LOP
Entity Title:	Not reported
Affiliation Address:	P.O. Box 129261
Affiliation City:	San Diego
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

D12 **DEL MAR THOROUGHBRED CLUB** **LUST** **S100933739**
ESE **2260 JIMMY DURANTE BLVD** **San Diego Co. HMMD** **N/A**
1/4-1/2 **DEL MAR, CA 92014** **WDS**
0.454 mi. **CERS**
2398 ft. **Site 1 of 3 in cluster D**

Relative:
Higher

Actual:
12 ft.

LUST REG 9:

Region:	9
Status:	Case Closed
Case Number:	9UT2696
Local Case:	H04644-003
Substance:	Diesel
Qty Leaked:	Not reported
Abate Method:	Excavate and Dispose - remove contaminated soil and dispose in approved site
Local Agency:	San Diego
How Found:	Tank Closure
How Stopped:	Close Tank
Source:	Tank
Cause:	Corrosion
Lead Agency:	Local Agency
Case Type:	Aquifer affected
Date Found:	07/06/1993
Date Stopped:	07/06/1993
Confirm Date:	07/06/1993
Submit Workplan:	Not reported
Prelim Assess:	07/06/1993
Desc Pollution:	Not reported
Remed Plan:	/ /
Remed Action:	Not reported
Began Monitor:	Not reported
Release Date:	07/08/1993
Enforce Date:	Not reported

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Closed Date: 9/26/00
Enforce Type: Not reported
Pilot Program: LOP
Basin Number: 905.11
GW Depth: 5.5
Beneficial Use: Municipal groundwater use
NPDES Number: Not reported
Priority: 2B
File Dispn: Not reported
Interim Remedial Actions: Not reported
Cleanup and Abatement order Number: Not reported
Waste Discharge Requirement Number: Not reported

Region: 9
Status: Case Closed
Case Number: 9UT756
Local Case: H04644-001
Substance: Unleaded Gasoline
Qty Leaked: Not reported
Abate Method: Excavate and Dispose - remove contaminated soil and dispose in approved site
Local Agency: San Diego
How Found: Tank Closure
How Stopped: New Tank
Source: Tank
Cause: Corrosion
Lead Agency: Local Agency
Case Type: Other ground water affected
Date Found: 07/01/1987
Date Stopped: 07/09/1987
Confirm Date: 07/09/1987
Submit Workplan: Not reported
Prelim Assess: 07/31/1987
Desc Pollution: Not reported
Remed Plan: / /
Remed Action: Not reported
Began Monitor: Not reported
Release Date: 07/09/1987
Enforce Date: Not reported
Closed Date: 9/26/00
Enforce Type: Not reported
Pilot Program: LOP
Basin Number: 905.11
GW Depth: 2.5'
Beneficial Use: NBNB/E
NPDES Number: Not reported
Priority: 2B
File Dispn: File discarded, case closed
Interim Remedial Actions: Yes
Cleanup and Abatement order Number: Not reported
Waste Discharge Requirement Number: Not reported

HMMD SAN DIEGO:
Name: DEL MAR THOROUGHBRED CLUB
Address: 2260 JIMMY DURANTE BLVD
City,State,Zip: DEL MAR, CA 92014
Permit Number: Not reported

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Business Type:	Not reported
EPA Id Number:	CAL000038829
APN:	Not reported
Last HMMD Inspection:	Not reported
Facility Telephone:	858-755-1141
Permit Status:	Permit Renewed
Permit Expiration:	Not reported
Date Last Updated:	08/09/2020
Facility Owner:	Not reported
Facility Mailing Address:	PO BOX 700, DEL MAR, CA 92014-0700
Facility Mailing City:	Not reported
Facility Mailing State:	Not reported
Facility Mailing Zip:	Not reported
UST Owner:	N
Handle Regulated Hazmat:	Not reported
Own Or Operate UST:	Not reported
Subject To APSA:	Not reported
Generate Haz Waste:	Y
Treat Haz Waste:	N
Generate Medical Waste:	Not reported

Inspection Violation:

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Program Element:	Hazardous Materials Release Response Plans
Inspection Type:	Routine
Inspection Number:	6023870
Return To Compliance Date:	2018-12-07T00:00:00.000
Nov:	No
Violation Classification:	Class II
Underground Storage Tank Id:	Not reported
Container/Tank Id:	Not reported
Last Update:	2020-08-09T19:03:43.000
Inspection Date:	2018-12-07T00:00:00.000
Violation Code:	1010008 HMBP not certified annually as complete and accurate in CERS. HSC 25508(a)(1)(A), 25508.2, 19 CCR 2654(b)

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Program Element:	Medical Waste
Inspection Type:	Routine
Inspection Number:	5786450
Return To Compliance Date:	2017-12-07T00:00:00.000
Nov:	No
Violation Classification:	Minor
Underground Storage Tank Id:	Not reported
Container/Tank Id:	Not reported
Last Update:	2020-08-09T19:03:43.000
Inspection Date:	2017-11-20T15:15:00.000
Violation Code:	HMD4209 Primary containers accumulating MW not labeled with an electronic tracking system label or a label with generator's name, address and phone number. SDCC 68.1205

Record ID:	DEH2002-HUPFP-104644

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Program Element:	Hazardous Waste Generator
Inspection Type:	Routine
Inspection Number:	6023870
Return To Compliance Date:	2019-04-16T00:00:00.000
Nov:	No
Violation Classification:	Class II
Underground Storage Tank Id:	Not reported
Container/Tank Id:	Not reported
Last Update:	2020-08-09T19:03:43.000
Inspection Date:	2018-12-07T00:00:00.000
Violation Code:	3020001 Failure to ensure employees are thoroughly familiar with proper waste handling and emergency procedures during normal facility operations and emergencies. 22 CCR 66262.34(d)(2); 40 CFR 262.34(d)(5)(iii)

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Program Element:	Aboveground Petroleum Storage Act
Inspection Type:	Routine
Inspection Number:	6023870
Return To Compliance Date:	2020-07-31T00:00:00.000
Nov:	No
Violation Classification:	Class II
Underground Storage Tank Id:	Not reported
Container/Tank Id:	Not reported
Last Update:	2020-08-09T19:03:43.000
Inspection Date:	2018-12-07T00:00:00.000
Violation Code:	4020001 Failed to train oil-handling personnel on: operation/maintenance of equipment to prevent discharges; discharge procedure protocols; applicable laws, rules, and regulations; general facility operations; and the contents of the SPCC Plan. (40 CFR 112.7(f)(1).) HSC 25270.4.5(a)

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Program Element:	Hazardous Materials Release Response Plans
Inspection Type:	Routine
Inspection Number:	4087999
Return To Compliance Date:	2014-11-03T00:00:00.000
Nov:	No
Violation Classification:	Minor
Underground Storage Tank Id:	Not reported
Container/Tank Id:	Not reported
Last Update:	2020-08-09T19:03:43.000
Inspection Date:	2014-11-03T00:00:00.000
Violation Code:	1010002 Owner/Operator failed to complete and/or submit a Hazardous Materials Business Plan when storing hazardous materials at or above the thresholds quantities of 55 gallons/500 lbs/200 cubic feet; HSC 6.95 25508(a)1A

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Program Element:	Medical Waste
Inspection Type:	Routine
Inspection Number:	4087999
Return To Compliance Date:	2014-11-03T00:00:00.000
Nov:	No
Violation Classification:	Minor
Underground Storage Tank Id:	Not reported
Container/Tank Id:	Not reported
Last Update:	2020-08-09T19:03:43.000
Inspection Date:	2014-11-03T00:00:00.000
Violation Code:	HMD4206 Spill of MW not properly cleaned up. 118300

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Program Element:	Medical Waste
Inspection Type:	Routine
Inspection Number:	4087999
Return To Compliance Date:	2014-11-03T00:00:00.000
Nov:	No
Violation Classification:	Minor
Underground Storage Tank Id:	Not reported
Container/Tank Id:	Not reported
Last Update:	2020-08-09T19:03:43.000
Inspection Date:	2014-11-03T00:00:00.000
Violation Code:	HMD4309 MWMP or equivalent information not onsite. 117945

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Program Element:	Hazardous Materials Release Response Plans
Inspection Type:	Routine
Inspection Number:	6023870
Return To Compliance Date:	2019-01-29T00:00:00.000
Nov:	No
Violation Classification:	Class II
Underground Storage Tank Id:	Not reported
Container/Tank Id:	Not reported
Last Update:	2020-08-09T19:03:43.000
Inspection Date:	2018-12-07T00:00:00.000
Violation Code:	1020002 Initial &/or annual employee training not conducted in safety procedures for a hazardous material release or threatened release &/or employee training records not available or not maintained for 3 years. HSC 25505(a)(4); 19 CCR 2659(b)

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Program Element:	Hazardous Materials Release Response Plans
Inspection Type:	Routine

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Inspection Number:	4087999
Return To Compliance Date:	2014-11-08T00:00:00.000
Nov:	No
Violation Classification:	Minor
Underground Storage Tank Id:	Not reported
Container/Tank Id:	Not reported
Last Update:	2020-08-09T19:03:43.000
Inspection Date:	2014-11-03T00:00:00.000
Violation Code:	1010007 Failure to submit a revised business plan upon a substantial change in the handler's operations; HSC 6.95 25508.1(f)

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Program Element:	Medical Waste
Inspection Type:	Routine
Inspection Number:	5786450
Return To Compliance Date:	2017-12-07T00:00:00.000
Nov:	No
Violation Classification:	Minor
Underground Storage Tank Id:	Not reported
Container/Tank Id:	Not reported
Last Update:	2020-08-09T19:03:43.000
Inspection Date:	2017-11-20T15:15:00.000
Violation Code:	HMD4208 Full sharps container not taped closed or tightly-lidded to preclude loss of contents. HSC 118285(b)

UST DTL:

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Facility Type (Ust Facility):	Not reported
Tank Owner Name:	DEL MAR THOROUGHBRED CLUB
Tankid:	18390
Tank Status:	Removed
Date Ust Permanently Closed:	01/14/2004
Tank Use:	01
Piping System Type:	Not reported
Last Updated:	2020-08-09T19:03:43.000
Tank Capacityin Gallons:	2000
Tank Contents:	1A
Type Of Tank:	95

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Facility Id Number:	37-000-104644
Facility Type (Ust Facility):	Not reported
Tank Owner Name:	DEL MAR THOROUGHBRED CLUB
Tankid:	18389
Tank Status:	Removed
Date Ust Permanently Closed:	06/07/1993
Tank Use:	01
Piping System Type:	Not reported
Last Updated:	2020-08-09T19:03:43.000

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Tank Capacityin Gallons: 550
Tank Contents: Diesel
Type Of Tank: 01

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Facility Id Number: 37-000-104644
Facility Type (Ust Facility): Not reported
Tank Owner Name: DEL MAR THOROUGHBRED CLUB
Tankid: 18388
Tank Status: Removed
Date Ust Permanently Closed: Not reported
Tank Use: 01
Piping System Type: 02
Last Updated: 2020-08-09T19:03:43.000
Tank Capacityin Gallons: 2000
Tank Contents: 1A
Type Of Tank: 02

Waste and Materials:
Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HCHEM-0128464
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: DEGREASER
Common Name: DEGREASER
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HWAST-0107116
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: WASTE 342 ORGANIC LIQUIDS W/METALS
Common Name: WASTE ANTIFREEZE
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HWAST-0107117
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: WASTE 135 UNSPECIFIED AQUEOUS SOL'N
Common Name: WASTE PARTS WASHER
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Child Record Id: DEH2017-HWAST-0107118
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: WASTE 221 WASTE OIL & MIXED OIL
Common Name: WASTE OIL
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HWAST-0107120
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: WASTE - OILY ABSORBENT
Common Name: WASTE - OILY ABSORBENT
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HWAST-0107121
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: WASTE - RED BAG
Common Name: WASTE - RED BAG
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HWAST-0107122
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: WASTE - PHARM
Common Name: WASTE - PHARM
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HWAST-0107119
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: WASTE 902 INFECTIOUS WASTE, SHARPS
Common Name: SHARPS
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HCHEM-0206619
Trade Secret: N

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Hazardous Material Type: Pure
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: GASOLINE
Common Name: REGULAR UNLEADED
Case Number: 8006-61-9

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HCHEM-0206620
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: OIL: LUBRICATING
Common Name: OIL: LUBRICATING
Case Number: 8002-05-9

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HWAST-0178215
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: WASTE 221 WASTE OIL & MIXED OIL
Common Name: WASTE OIL
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HWAST-0178216
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: WASTE 902 INFECTIOUS WASTE, SHARPS
Common Name: SHARPS
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HWAST-0178217
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: WASTE - OILY ABSORBENT
Common Name: WASTE - OILY ABSORBENT
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HWAST-0178219
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-04-16T02:32:16.000

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Chemical Name: WASTE - PHARM
Common Name: WASTE - PHARM
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HWAST-0178214
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: WASTE 135 UNSPECIFIED AQUEOUS SOL'N
Common Name: WASTE PARTS WASHER
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HCHEM-0272987
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: GASOLINE
Common Name: REGULAR UNLEADED
Case Number: 8006-61-9

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HCHEM-0272988
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: OIL: LUBRICATING
Common Name: OIL: LUBRICATING
Case Number: 8002-05-9

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HCHEM-0272989
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: DIESEL
Common Name: DIESEL
Case Number: 68476-34-6

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HCHEM-0272990
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: CARBRITE CLEAN ALL; CONTAINS POTASSIUM HYDROXIDE
Common Name: CARBRITE CLEAN ALL; CONTAINS POTASSIUM HYDROXIDE

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Case Number:	Not reported
Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Child Record Id:	DEH2020-HCHEM-0272991
Trade Secret:	N
Hazardous Material Type:	Pure
Last Updated:	2020-08-09T19:03:43.000
Chemical Name:	VINYLE ACRYLIC PAINT ETHYLENE GLYCOL
Common Name:	ACRYLIC PAINT
Case Number:	107-21-1
Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Child Record Id:	DEH2020-HCHEM-0272992
Trade Secret:	N
Hazardous Material Type:	Mixture
Last Updated:	2020-08-09T19:03:43.000
Chemical Name:	INERT GASES CARBON DIOXIDE; COMPRESSED GAS W/ARGON
Common Name:	ARGON CO2 MIX
Case Number:	124-38-9
Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Child Record Id:	DEH2020-HCHEM-0272993
Trade Secret:	N
Hazardous Material Type:	Pure
Last Updated:	2020-08-09T19:03:43.000
Chemical Name:	CALCIUM HYDROXIDE CAUSTIC LIME
Common Name:	CALCIUM HYDROXIDE CAUSTIC LIME
Case Number:	1305-62-0
Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Child Record Id:	DEH2020-HCHEM-0272994
Trade Secret:	N
Hazardous Material Type:	Mixture
Last Updated:	2020-08-09T19:03:43.000
Chemical Name:	DEGREASER
Common Name:	DEGREASER
Case Number:	Not reported
Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Child Record Id:	DEH2020-HCHEM-0272995
Trade Secret:	N
Hazardous Material Type:	Pure
Last Updated:	2020-08-09T19:03:43.000
Chemical Name:	ACETYLENE
Common Name:	ACETYLENE
Case Number:	74-86-2

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HCHEM-0272996
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: Oxygen
Common Name: Oxygen Gas
Case Number: 7782-44-7

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HWAST-0241948
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: WASTE 342 ORGANIC LIQUIDS W/METALS
Common Name: WASTE ANTIFREEZE
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HWAST-0241949
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: WASTE 135 UNSPECIFIED AQUEOUS SOL'N
Common Name: WASTE PARTS WASHER
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HWAST-0241950
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: WASTE 221 WASTE OIL & MIXED OIL
Common Name: WASTE OIL
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HWAST-0241951
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: WASTE 902 INFECTIOUS WASTE, SHARPS
Common Name: SHARPS
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Active Permit: Y
Child Record Id: DEH2020-HWAST-0241952
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: WASTE - OILY ABSORBENT
Common Name: WASTE - OILY ABSORBENT
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HWAST-0241953
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: WASTE - RED BAG
Common Name: WASTE - RED BAG
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HWAST-0241954
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-08-09T19:03:43.000
Chemical Name: WASTE - PHARM
Common Name: WASTE - PHARM
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HCHEM-0206623
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: VINYLE ACRYLIC PAINT ETHYLENE GLYCOL
Common Name: ACRYLIC PAINT
Case Number: 107-21-1

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HCHEM-0206624
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: INERT GASES CARBON DIOXIDE; COMPRESSED GAS W/ARGON
Common Name: ARGON CO2 MIX
Case Number: 124-38-9

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HCHEM-0206625

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: OXYGEN
Common Name: OXYGEN
Case Number: 7782-44-7

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HCHEM-0206626
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: CALCIUM HYDROXIDE CAUSTIC LIME
Common Name: CALCIUM HYDROXIDE CAUSTIC LIME
Case Number: 1305-62-0

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HWAST-0178213
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: WASTE 342 ORGANIC LIQUIDS W/METALS
Common Name: WASTE ANTIFREEZE
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HCHEM-0206621
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: DIESEL
Common Name: DIESEL
Case Number: 68476-34-6

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HCHEM-0206622
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: CARBRITE CLEAN ALL; CONTAINS POTASSIUM HYDROXIDE
Common Name: CARBRITE CLEAN ALL; CONTAINS POTASSIUM HYDROXIDE
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HCHEM-0206627
Trade Secret: N
Hazardous Material Type: Mixture

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Last Updated: 2020-04-16T02:32:16.000
Chemical Name: DEGREASER
Common Name: DEGREASER
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HCHEM-0206628
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: ACETYLENE
Common Name: ACETYLENE
Case Number: 74-86-2

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HWAST-0178218
Trade Secret: N
Hazardous Material Type: Not reported
Last Updated: 2020-04-16T02:32:16.000
Chemical Name: WASTE - RED BAG
Common Name: WASTE - RED BAG
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HCHEM-0128458
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: CARBRITE CLEAN ALL; CONTAINS POTASSIUM HYDROXIDE
Common Name: CARBRITE CLEAN ALL; CONTAINS POTASSIUM HYDROXIDE
Case Number: Not reported

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HCHEM-0128459
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: VINYLE ACRYLIC PAINT ETHYLENE GLYCOL
Common Name: ACRYLIC PAINT
Case Number: 107-21-1

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HCHEM-0128460
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: INERT GASES CARBON DIOXIDE; COMPRESSED GAS W/ARGON

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Common Name: ARGON CO2 MIX
Case Number: 124-38-9

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HCHEM-0128455
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: GASOLINE
Common Name: REGULAR UNLEADED
Case Number: 8006-61-9

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HCHEM-0128456
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: OIL: LUBRICATING
Common Name: OIL: LUBRICATING
Case Number: 8002-05-9

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HCHEM-0128457
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: DIESEL
Common Name: DIESEL
Case Number: 68476-34-6

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HCHEM-0128461
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: OXYGEN
Common Name: OXYGEN
Case Number: 7782-44-7

Record ID: DEH2002-HUPFP-104644
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HCHEM-0128462
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2018-04-20T02:32:14.000
Chemical Name: CALCIUM HYDROXIDE CAUSTIC LIME
Common Name: CALCIUM HYDROXIDE CAUSTIC LIME
Case Number: 1305-62-0

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Record ID:	DEH2002-HUPFP-104644
Permit Status:	Permit Renewed
Active Permit:	Y
Child Record Id:	DEH2017-HCHEM-0128463
Trade Secret:	N
Hazardous Material Type:	Pure
Last Updated:	2018-04-20T02:32:14.000
Chemical Name:	ACETYLENE
Common Name:	ACETYLENE
Case Number:	74-86-2

Name:	VERIZON WIRELESS - DEL MAR RACETRACK
Address:	2260 JIMMY DURANTE BLVD
City,State,Zip:	DEL MAR, CA 92014
Permit Number:	136166
Business Type:	6HK18
EPA Id Number:	Not reported
APN:	299-071-03-00
Last HMMD Inspection:	03/14/2012
Facility Telephone:	949-286-7000
Permit Status:	OPEN
Permit Expiration:	07/31/2013
Date Last Updated:	11/02/2012
Facility Owner:	VERIZON WIRELESS
Facility Mailing Address:	15505 SAND CANYON AV #D
Facility Mailing City:	IRVINE
Facility Mailing State:	CA
Facility Mailing Zip:	92618-
UST Owner:	Not reported
Handle Regulated Hazmat:	Y
Own Or Operate UST:	Not reported
Subject To APSA:	Not reported
Generate Haz Waste:	Not reported
Treat Haz Waste:	Not reported
Generate Medical Waste:	Not reported

Inventory Active Permits (not SQG Medical):

Permit Number:	136166
Update Date:	11/02/2012
Case Number:	7664-93-9
Name:	SULFURIC ACID SOLUTION IN 12 BATTERY
Other Information:	CELLS (6NB ABSOLYTE IIP)
Material Waste:	Material
Hazardous Categories 1:	ACUTE
Hazardous Categories 2:	EXTREMELY HAZARDOUS

Violations Active Permits:

Permit Number:	136166
Update Date:	11/02/2012
Inspection Date:	01/10/2007
Violation Code:	6HV1002
Violation:	HMBP NOT ESTABISHED/IMPLEMENTED.
Violation Citation:	Hazardous materials handler has not established/implemented a business plan. HSC 25503.5(a)
Activity:	ACTIVE

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DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

WDS:

Name:	DEL MAR FAIRGROUNDS/RACETRACK
Address:	2260 JIMMY DURANTE BLVD
City:	DEL MAR
Facility ID:	San Diego 37I001942
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	CAS000001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board
Subregion:	9
Facility Telephone:	Not reported
Facility Contact:	Not reported
Agency Name:	22ND DIST AGRICULTURAL ASSOC
Agency Address:	2260 JIMMY DURANTE BLVD
Agency City,St,Zip:	DEL MAR 920142216
Agency Contact:	Not reported
Agency Telephone:	Not reported
Agency Type:	Private
SIC Code:	0
SIC Code 2:	Not reported
Primary Waste Type:	Not reported
Primary Waste:	Not reported
Waste Type2:	Not reported
Waste2:	Not reported
Primary Waste Type:	Not reported
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	Not reported
POTW:	Not reported
Treat To Water:	Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality.
Complexity:	Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

CERS:

Name:	VERIZON WIRELESS: DEL MAR RACETRACK
Address:	2260 JIMMY DURANTE BLVD
City,State,Zip:	DEL MAR, CA 92014
Site ID:	166578
CERS ID:	10161987

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

CERS Description: Chemical Storage Facilities

Evaluation:

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	04-23-2015
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Inspector: Khan Steven Inspection ID:4096812
Eval Division:	San Diego County Department of Env Health
Eval Program:	HMRRP
Eval Source:	CERS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	05-05-2017
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Inspector: Khan Steven Inspection ID:5647012
Eval Division:	San Diego County Department of Env Health
Eval Program:	HMRRP
Eval Source:	CERS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	05-17-2019
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Inspector: Fernandez Juan Inspection ID:6165958
Eval Division:	San Diego County Department of Env Health
Eval Program:	HMRRP
Eval Source:	CERS

Coordinates:

Site ID:	166578
Facility Name:	Verizon Wireless: Del Mar Racetrack
Env Int Type Code:	HMBP
Program ID:	10161987
Coord Name:	Not reported
Ref Point Type Desc:	Center of a facility or station.
Latitude:	32.972410
Longitude:	-117.258340

Affiliation:

Affiliation Type Desc:	Document Preparer
Entity Name:	Steve Skanderson, Stantec
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	15505 Sand Canyon Avenue, MS D-104
Affiliation City:	Irvine
Affiliation State:	CA

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Affiliation Country: Not reported
Affiliation Zip: 92618
Affiliation Phone: Not reported

Affiliation Type Desc: CUPA District
Entity Name: San Diego County Env Health
Entity Title: Not reported
Affiliation Address: PO Box 129261
Affiliation City: San Diego
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92112-9261
Affiliation Phone: (858) 505-6880

Affiliation Type Desc: Environmental Contact
Entity Name: Environmental Compliance
Entity Title: Not reported
Affiliation Address: 15505 Sand Canyon Avenue, MS D-104
Affiliation City: Irvine
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92618
Affiliation Phone: Not reported

Affiliation Type Desc: Identification Signer
Entity Name: Wilson Rodriguez
Entity Title: Engr III Spec-RE/Regulatory
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Legal Owner
Entity Name: Verizon Wireless
Entity Title: Not reported
Affiliation Address: 15505 Sand Canyon Avenue, MS D-104
Affiliation City: Irvine
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 92618
Affiliation Phone: (949) 286-7000

Affiliation Type Desc: Operator
Entity Name: Verizon Wireless
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: (949) 286-7000

Affiliation Type Desc: Parent Corporation
Entity Name: Verizon Wireless [Southern California]
Entity Title: Not reported

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100933739**

Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

D13 **PREMIER FOOD SERVICES** **LUST** **S104745683**
ESE **2260 JIMMY DURANTE BLVD STE B** **SAN DIEGO CO. SAM** **N/A**
1/4-1/2 **DEL MAR, CA 92014** **San Diego Co. HMMD**
0.454 mi. **CHMIRS**
2398 ft. **Site 2 of 3 in cluster D** **Cortese**
EMI
Relative: Higher **HAZNET**
HIST CORTESE
Actual: 12 ft. **NPDES**
CIWQS
CERS
HWTS

LUST:

Name:	AGRICULTURAL ASSOC - 22ND DIST
Address:	2260 JIMMY DURANTE BL
City,State,Zip:	DEL MAR, CA 920142216
Lead Agency:	SAN DIEGO COUNTY LOP
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0607302352
Global Id:	T0607302352
Latitude:	32.9739019996568
Longitude:	-117.260166459291
Status:	Completed - Case Closed
Status Date:	10/12/2000
Case Worker:	Not reported
RB Case Number:	9UT3584
Local Agency:	Not reported
File Location:	Local Agency
Local Case Number:	H03436-001
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

LUST:

Global Id:	T0607302352
Action Type:	ENFORCEMENT
Date:	10/12/2000
Action:	Closure/No Further Action Letter

Global Id:	T0607302352
Action Type:	Other
Date:	10/30/1997
Action:	Leak Began

Global Id:	T0607302352
Action Type:	Other
Date:	10/30/1997
Action:	Leak Discovery

DRAFT

PREMIER FOOD SERVICES (Continued) **S104745683**

Global Id: T0607302352
Action Type: Other
Date: 10/30/1997
Action: Leak Stopped

Global Id: T0607302352
Action Type: Other
Date: 11/17/1997
Action: Leak Reported

LUST:
Global Id: T0607302352
Status: Open - Case Begin Date
Status Date: 10/30/1997

Global Id: T0607302352
Status: Completed - Case Closed
Status Date: 10/12/2000

SAN DIEGO CO. SAM:
Name: AGRICULTURAL ASSOC - 22ND DIST
Address: 2260 JIMMY DURANTE BL
City,State,Zip: DEL MAR, CA 920142216
Case Number: H03436-001
Agency: DEH Site Assessment & Mitigation
Funding: **LOP - Federal Fund**
Facility Type: Soils Only
Facility Status: Closed Case
Date: 10/12/2000
Date Began: 10/30/1997

HMMD SAN DIEGO:
Name: PREMIER FOOD SERVICES
Address: 2260 JIMMY DURANTE BLVD B
City,State,Zip: DEL MAR, CA 92014-2216
Permit Number: Not reported
Business Type: Not reported
EPA Id Number: Not reported
APN: Not reported
Last HMMD Inspection: Not reported
Facility Telephone: 8587556345
Permit Status: Permit Renewed
Permit Expiration: Not reported
Date Last Updated: 04/21/2020
Facility Owner: Not reported
Facility Mailing Address: 2260 Jimmy Durante Blvd., Del Mar, CA 92014
Facility Mailing City: Not reported
Facility Mailing State: Not reported
Facility Mailing Zip: Not reported
UST Owner: N
Handle Regulated Hazmat: Not reported
Own Or Operate UST: Not reported
Subject To APSA: Not reported
Generate Haz Waste: N
Treat Haz Waste: N

DRAFT

PREMIER FOOD SERVICES (Continued) **S104745683**

Generate Medical Waste: Not reported

Inspection Violation:
- Record ID: DEH2018-HUPFP-004112
- Permit Status: Permit Renewed
- Active Permit: Y
- Facility Id Number: 37-000-004112
- Program Element: Hazardous Materials Release Response Plans
- Inspection Type: Initial Inspection
- Inspection Number: 5883970
- Return To Compliance Date: 2018-04-10T00:00:00.000
- Nov: Yes
- Violation Classification: Class I
- Underground Storage Tank Id: Not reported
- Container/Tank Id: Not reported
- Last Update: 2020-04-21T00:00:00.000
- Inspection Date: 2017-12-07T20:31:00.000
- Violation Code: HMD1001 Unified Program Facility permit not obtained for hazardous materials. SDCC 68.905; 68.906, 68.907

Waste and Materials:
- Record ID: DEH2018-HUPFP-004112
- Permit Status: Permit Renewed
- Active Permit: Y
- Child Record Id: DEH2020-HCHEM-0243141
- Trade Secret: N
- Hazardous Material Type: Pure
- Last Updated: 2020-04-21T02:33:09.000
- Chemical Name: Carbon Dioxide
- Common Name: Carbon Dioxide
- Case Number: 124-38-9

- Record ID: DEH2018-HUPFP-004112
- Permit Status: Permit Renewed
- Active Permit: Y
- Child Record Id: DEH2020-HCHEM-0243142
- Trade Secret: N
- Hazardous Material Type: Pure
- Last Updated: 2020-04-21T02:33:09.000
- Chemical Name: Liquefied Petroleum Gas
- Common Name: Liquified Petroleum Gas
- Case Number: 68476-85-7

- Record ID: DEH2018-HUPFP-004112
- Permit Status: Permit Renewed
- Active Permit: Y
- Child Record Id: DEH2019-HCHEM-0206642
- Trade Secret: N
- Hazardous Material Type: Pure
- Last Updated: 2019-04-16T02:35:50.000
- Chemical Name: Carbon Dioxide
- Common Name: Carbon Dioxide
- Case Number: 124-38-9

- Record ID: DEH2018-HUPFP-004112
- Permit Status: Permit Renewed
- Active Permit: Y

DRAFT

PREMIER FOOD SERVICES (Continued) **S104745683**

Child Record Id: DEH2019-HCHEM-0206643
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2019-04-16T02:35:50.000
Chemical Name: Liquefied Petroleum Gas
Common Name: Liquified Petroleum Gas
Case Number: 68476-85-7

Record ID: DEH2018-HUPFP-004112
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2018-HCHEM-0173852
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2018-10-25T21:55:16.000
Chemical Name: Carbon Dioxide
Common Name: Carbon Dioxide
Case Number: 124-38-9

Record ID: DEH2018-HUPFP-004112
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2018-HCHEM-0173853
Trade Secret: N
Hazardous Material Type: Pure
Last Updated: 2018-10-25T21:55:16.000
Chemical Name: Liquefied Petroleum Gas
Common Name: Liquified Petroleum Gas
Case Number: 68476-85-7

Name: AT&T MOBILITY - DEL MAR FAIRGROUNDS (USID113486)
Address: 2260 JIMMY DURANTE BLVD
City,State,Zip: DEL MAR, CA 92014-2216
Permit Number: Not reported
Business Type: Not reported
EPA Id Number: Not reported
APN: Not reported
Last HMMD Inspection: Not reported
Facility Telephone: (800) 638-2822
Permit Status: Permit Renewed
Permit Expiration: Not reported
Date Last Updated: 01/09/2021
Facility Owner: Not reported
Facility Mailing Address: 308 S. Akard St., 17th Floor, Dallas, TX 75202
Facility Mailing City: Not reported
Facility Mailing State: Not reported
Facility Mailing Zip: Not reported
UST Owner: N
Handle Regulated Hazmat: Not reported
Own Or Operate UST: Not reported
Subject To APSA: Not reported
Generate Haz Waste: N
Treat Haz Waste: N
Generate Medical Waste: Not reported

Waste and Materials:
Record ID: DEH2014-HUPFP-001034

DRAFT

PREMIER FOOD SERVICES (Continued) **S104745683**

Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2020-HCHEM-0267822
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2021-01-09T02:01:08.000
Chemical Name: Lead Acid Batteries
Common Name: Lead Acid Batteries
Case Number: Not reported

Record ID: DEH2014-HUPFP-001034
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2018-HCHEM-0189762
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2019-04-17T02:32:44.000
Chemical Name: Lead Acid Batteries
Common Name: Lead Acid Batteries
Case Number: Not reported

Record ID: DEH2014-HUPFP-001034
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2019-HCHEM-0225979
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2020-04-25T02:33:07.000
Chemical Name: Lead Acid Batteries
Common Name: Lead Acid Batteries
Case Number: Not reported

Record ID: DEH2014-HUPFP-001034
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2018-HCHEM-0167583
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2018-04-14T02:32:24.000
Chemical Name: Lead-Acid Batteries
Common Name: Lead-Acid Batteries
Case Number: Not reported

Record ID: DEH2014-HUPFP-001034
Permit Status: Permit Renewed
Active Permit: Y
Child Record Id: DEH2017-HCHEM-0151620
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2017-08-25T01:13:04.000
Chemical Name: Lead-Acid Batteries
Common Name: Lead-Acid Batteries
Case Number: Not reported

Record ID: DEH2014-HUPFP-001034
Permit Status: Permit Renewed
Active Permit: Y

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PREMIER FOOD SERVICES (Continued) **S104745683**

Child Record Id: DEH2016-HCHEM-0111434
Trade Secret: N
Hazardous Material Type: Mixture
Last Updated: 2016-08-26T01:43:00.000
Chemical Name: Lead-Acid Batteries
Common Name: Lead-Acid Batteries
Case Number: Not reported

CHMIRS:
Name: Not reported
Address: 2260 JIMMY DURANTE BLVD
City,State,Zip: DEL MAR, CA 92014
OES Incident Number: 15-2132
OES notification: 04/15/2015
OES Date: Not reported
OES Time: Not reported
Date Completed: Not reported
Property Use: Not reported
Agency Id Number: Not reported
Agency Incident Number: Not reported
Time Notified: Not reported
Time Completed: Not reported
Surrounding Area: Not reported
Estimated Temperature: Not reported
Property Management: Not reported
More Than Two Substances Involved?: Not reported
Resp Agncy Personel # Of Decontaminated: Not reported
Responding Agency Personel # Of Injuries: Not reported
Responding Agency Personel # Of Fatalities: Not reported
Others Number Of Decontaminated: Not reported
Others Number Of Injuries: Not reported
Others Number Of Fatalities: Not reported
Vehicle Make/year: Not reported
Vehicle License Number: Not reported
Vehicle State: Not reported
Vehicle Id Number: Not reported
CA DOT PUC/ICC Number: Not reported
Company Name: Not reported
Reporting Officer Name/ID: Not reported
Report Date: Not reported
Facility Telephone: Not reported
Waterway Involved: No
Waterway: Not reported
Spill Site: Merchant/Business
Cleanup By: Responsible Party
Containment: Not reported
What Happened: Not reported
Type: Not reported
Measure: Not reported
Other: Not reported
Type: PETROLEUM
Measure: Gal(s)
Other: Not reported
Date/Time: 1545
Year: 2015
Agency: USMC

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PREMIER FOOD SERVICES (Continued) **S104745683**

Incident Date:	04/15/2015
Admin Agency:	San Diego County Health Services Department
Amount:	Not reported
Contained:	Yes
Site Type:	Not reported
E Date:	Not reported
Substance:	Transmission Oil
Quantity Released:	20
Unknown:	Not reported
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	Not reported
Number of Injuries:	Not reported
Number of Fatalities:	Not reported
#1 Pipeline:	No
#2 Pipeline:	No
#3 Pipeline:	No
#1 Vessel >= 300 Tons:	No
#2 Vessel >= 300 Tons:	No
#3 Vessel >= 300 Tons:	No
Evacs:	No
Injuries:	No
Fatals:	No
Comments:	Not reported
Description:	RP states that a oil discharged from a the helicopter due to a mechanical failure. Release is contained and cleanup and repairs are in progress.

CORTESE:

Name:	AGRICULTURAL ASSOC - 22ND DIST
Address:	2260 JIMMY DURANTE BL
City,State,Zip:	DEL MAR, CA 920142216
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	T0607302352
Site/Facility Type:	LUST CLEANUP SITE
Cleanup Status:	COMPLETED - CASE CLOSED
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	active
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Active Open

EMI:

DRAFT

PREMIER FOOD SERVICES (Continued) **S104745683**

Name:	CA ST OF 22ND DISTRICT AGRIC A
Address:	2260 JIMMY DURANTE BL
City,State,Zip:	DEL MAR, CA 92014
Year:	2000
County Code:	37
Air Basin:	SD
Facility ID:	1553
Air District Name:	SD
SIC Code:	7999
Air District Name:	SAN DIEGO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Name:	CA ST OF 22ND DISTRICT AGRIC A
Address:	2260 JIMMY DURANTE BL
City,State,Zip:	DEL MAR, CA 92014
Year:	2001
County Code:	37
Air Basin:	SD
Facility ID:	1553
Air District Name:	SD
SIC Code:	7999
Air District Name:	SAN DIEGO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Name:	CA ST OF 22ND DISTRICT AGRIC A
Address:	2260 JIMMY DURANTE BL
City,State,Zip:	DEL MAR, CA 92014
Year:	2002
County Code:	37
Air Basin:	SD
Facility ID:	1553
Air District Name:	SD
SIC Code:	7999
Air District Name:	SAN DIEGO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0

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PREMIER FOOD SERVICES (Continued) **S104745683**

Particulate Matter Tons/Yr: 0
Part. Matter 10 Micrometers and Smllr Tons/Yr: 0

Name: CA ST OF 22ND DISTRICT AGRIC A
Address: 2260 JIMMY DURANTE BL
City,State,Zip: DEL MAR, CA 92014
Year: 2003
County Code: 37
Air Basin: SD
Facility ID: 1553
Air District Name: SD
SIC Code: 7999
Air District Name: SAN DIEGO COUNTY APCD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 0
Reactive Organic Gases Tons/Yr: 0
Carbon Monoxide Emissions Tons/Yr: 0
NOX - Oxides of Nitrogen Tons/Yr: 0
SOX - Oxides of Sulphur Tons/Yr: 0
Particulate Matter Tons/Yr: 0
Part. Matter 10 Micrometers and Smllr Tons/Yr: 0

Name: CA ST OF 22ND DISTRICT AGRIC A
Address: 2260 JIMMY DURANTE BL
City,State,Zip: DEL MAR, CA 92014
Year: 2004
County Code: 37
Air Basin: SD
Facility ID: 1553
Air District Name: SD
SIC Code: 7999
Air District Name: SAN DIEGO COUNTY APCD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 0.0463705
Reactive Organic Gases Tons/Yr: 0.043267125
Carbon Monoxide Emissions Tons/Yr: 0.07699525
NOX - Oxides of Nitrogen Tons/Yr: 0.33697375
SOX - Oxides of Sulphur Tons/Yr: 0.00434875
Particulate Matter Tons/Yr: 0.019433
Part. Matter 10 Micrometers and Smllr Tons/Yr: 0.019093

Name: CA ST OF 22ND DISTRICT AGRIC A
Address: 2260 JIMMY DURANTE BL
City,State,Zip: DEL MAR, CA 92014
Year: 2005
County Code: 37
Air Basin: SD
Facility ID: 1553
Air District Name: SD
SIC Code: 7999
Air District Name: SAN DIEGO COUNTY APCD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: .0463705
Reactive Organic Gases Tons/Yr: .043267125

DRAFT

PREMIER FOOD SERVICES (Continued) **S104745683**

Carbon Monoxide Emissions Tons/Yr: .07699525
NOX - Oxides of Nitrogen Tons/Yr: .33697375
SOX - Oxides of Sulphur Tons/Yr: .00434875
Particulate Matter Tons/Yr: .0201967505854800936
Part. Matter 10 Micrometers and Smllr Tons/Yr:.019093

Name: CA ST OF 22ND DISTRICT AGRIC A
Address: 2260 JIMMY DURANTE BL
City,State,Zip: DEL MAR, CA 92014
Year: 2006
County Code: 37
Air Basin: SD
Facility ID: 1553
Air District Name: SD
SIC Code: 7999
Air District Name: SAN DIEGO COUNTY APCD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: .0463705
Reactive Organic Gases Tons/Yr: .043267125
Carbon Monoxide Emissions Tons/Yr: .07699525
NOX - Oxides of Nitrogen Tons/Yr: .33697375
SOX - Oxides of Sulphur Tons/Yr: .00434875
Particulate Matter Tons/Yr: .0201967505854800936
Part. Matter 10 Micrometers and Smllr Tons/Yr:.019093

HAZNET:
Name: CITY OF ENCINITAS - PUBLIC WORKS
Address: 2260 JIMMY DURANTE BLVD
Address 2: Not reported
City,State,Zip: DEL MAR, CA 920140000
Contact: LIN WURBS
Telephone: 7606332763
Mailing Name: Not reported
Mailing Address: 505 S VULCAN AVE

Year: 2000
Gepaid: CAH777001197
TSD EPA ID: CAD044429835
CA Waste Code: 612 - Household waste
Disposal Method: R01 - Recycler
Tons: 13.344

Year: 2000
Gepaid: CAH777001197
TSD EPA ID: CAD981696420
CA Waste Code: 221 - Waste oil and mixed oil
Disposal Method: H01 - Transfer Station
Tons: 3.705

Year: 2000
Gepaid: CAH777001197
TSD EPA ID: CAD981696420
CA Waste Code: 134 - Aqueous solution with total organic residues less than 10 percent
Disposal Method: -
Tons: 0.882

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PREMIER FOOD SERVICES (Continued) **S104745683**

Additional Info:

Year:	2000
Gen EPA ID:	CAH777001197
Shipment Date:	20000115
Creation Date:	3/7/2000 0:00:00
Receipt Date:	20000115
Manifest ID:	99892717
Trans EPA ID:	CAD982413262
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD981696420
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	221 - Waste oil and mixed oil
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	3.705
Waste Quantity:	975
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20000115
Creation Date:	3/22/2000 0:00:00
Receipt Date:	20000120
Manifest ID:	96045472
Trans EPA ID:	CAT000624247
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD044429835
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	612 - Household waste
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	13.344
Waste Quantity:	3200
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20000115
Creation Date:	3/7/2000 0:00:00
Receipt Date:	20000115
Manifest ID:	99892717
Trans EPA ID:	CAD982413262

DRAFT

PREMIER FOOD SERVICES (Continued) **S104745683**

Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD981696420
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	134 - Aqueous solution with <10% total organic residues
RCRA Code:	Not reported
Meth Code:	- Not reported
Quantity Tons:	0.882
Waste Quantity:	210
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

HIST CORTESE:

edr_fname:	DEL MAR THOROUGHBRED CLUB
edr_fadd1:	2260 JIMMY DURANTE
City,State,Zip:	DEL MAR, CA 92014
Region:	CORTESE
Facility County Code:	37
Reg By:	LTNKA
Reg Id:	9UT2696

edr_fname:	DEL MAR FAIR
edr_fadd1:	2260 JIMMY DURANTE
City,State,Zip:	DEL MAR, CA 92014
Region:	CORTESE
Facility County Code:	37
Reg By:	LTNKA
Reg Id:	9UT3584

edr_fname:	DEL MAR THOROUGHBRED CLUB
edr_fadd1:	2260 JIMMY DURANTE
City,State,Zip:	DEL MAR, CA 92014
Region:	CORTESE
Facility County Code:	37
Reg By:	LTNKA
Reg Id:	9UT756

NPDES:

Name:	DEL MAR FAIRGROUNDS HABITAT RESTORATION
Address:	2260 JIMMY DURANTE BLVD
City,State,Zip:	DEL MAR, CA 92014
Facility Status:	Terminated
NPDES Number:	CAS000002
Region:	9
Agency Number:	0
Regulatory Measure ID:	312832
Place ID:	Not reported
Order Number:	2009-0009-DWQ
WDID:	9 37C343985

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PREMIER FOOD SERVICES (Continued) **S104745683**

Regulatory Measure Type:	Enrollee
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	10/13/2006
Termination Date Of Regulatory Measure:	04/15/2019
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	2260 Jimmy Durante Blvd
Discharge Name:	22nd District Agricultural Association
Discharge City:	Del Mar
Discharge State:	California
Discharge Zip:	92014
Status:	Not reported
Status Date:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported

NPDES as of 03/2018:

NPDES Number:	CAS000002
Status:	Active
Agency Number:	0
Region:	9
Regulatory Measure ID:	312832
Order Number:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	9 37C343985
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	10/13/2006
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	22nd District Agricultural Association
Discharge Address:	2260 Jimmy Durante Blvd
Discharge City:	Del Mar
Discharge State:	California
Discharge Zip:	92014
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	9
Regulatory Measure ID:	312832
Order Number:	Not reported
Regulatory Measure Type:	Construction
Place ID:	Not reported
WDID:	9 37C343985
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Received Date:	05/09/2008
Processed Date:	10/13/2006
Status:	Active
Status Date:	10/13/2006
Place Size:	4.94
Place Size Unit:	Acres
Contact:	Rebecca Bartling
Contact Title:	Deputy General Manager
Contact Phone:	858-792-4202
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	22nd District Agricultural Association
Operator Address:	2260 Jimmy Durante Blvd
Operator City:	Del Mar
Operator State:	California
Operator Zip:	92014
Operator Contact:	Rebecca Bartling
Operator Contact Title:	Deputy General Manager
Operator Contact Phone:	858-792-4202
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	rbartling@sdfair.com
Operator Type:	Special District
Developer:	22nd District Agricultural Association
Developer Address:	2260 Jimmy Durante Blvd
Developer City:	Del Mar
Developer State:	California
Developer Zip:	92014
Developer Contact:	Rebecca Bartling
Developer Contact Title:	Deputy General Manager
Constype Linear Utility Ind:	N
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	N
Constype Below Ground Ind:	N
Constype Cable Line Ind:	N
Constype Comm Line Ind:	N
Constype Commertial Ind:	N
Constype Electrical Line Ind:	N
Constype Gas Line Ind:	N
Constype Industrial Ind:	N
Constype Other Description:	Not reported
Constype Other Ind:	N
Constype Recons Ind:	N
Constype Residential Ind:	N
Constype Transport Ind:	N
Constype Utility Description:	Not reported
Constype Utility Ind:	N
Constype Water Sewer Ind:	N
Dir Discharge Uswater Ind:	Y
Receiving Water Name:	San Dieguito River
Certifier:	Gary Reist
Certifier Title:	Not reported
Certification Date:	26-JUN-10
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Name:	DEL MAR FAIRGROUNDS PHASE II STORMWATER IMPROVEMENTS
Address:	2260 JIMMY DURANTE BLVD
City,State,Zip:	DEL MAR, CA 92014
Facility Status:	Not reported
NPDES Number:	Not reported
Region:	Not reported
Agency Number:	Not reported
Regulatory Measure ID:	Not reported
Place ID:	Not reported
Order Number:	Not reported
WDID:	9 37C383650
Regulatory Measure Type:	Construction
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	Not reported
Discharge Name:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Status:	Active
Status Date:	06/13/2018
Operator Name:	22nd District Agricultural Association
Operator Address:	2260 Jimmy Durante Blvd
Operator City:	Del Mar
Operator State:	California
Operator Zip:	92014

Name:	TURF TRACK EXPANSION
Address:	2260 JIMMY DURANTE BLVD
City,State,Zip:	DEL MAR, CA 92014
Facility Status:	Not reported
NPDES Number:	Not reported
Region:	Not reported
Agency Number:	Not reported
Regulatory Measure ID:	Not reported
Place ID:	Not reported
Order Number:	Not reported
WDID:	9 37C367399
Regulatory Measure Type:	Construction
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	Not reported
Discharge Name:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Status:	Terminated
Status Date:	10/18/2019
Operator Name:	22nd District Agricultural Association
Operator Address:	2260 Jimmy Durante Blvd
Operator City:	Del Mar

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PREMIER FOOD SERVICES (Continued) **S104745683**

Operator State:	California
Operator Zip:	92014

NPDES as of 03/2018:

NPDES Number:	CAS000002
Status:	Active
Agency Number:	0
Region:	9
Regulatory Measure ID:	439924
Order Number:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	9 37C367399
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	08/12/2013
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	22nd District Agricultural Association
Discharge Address:	2260 Jimmy Durante Blvd
Discharge City:	Del Mar
Discharge State:	California
Discharge Zip:	92014
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	9
Regulatory Measure ID:	439924
Order Number:	Not reported
Regulatory Measure Type:	Construction
Place ID:	Not reported
WDID:	9 37C367399
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	07/31/2013
Processed Date:	08/12/2013
Status:	Active
Status Date:	08/12/2013
Place Size:	75.7
Place Size Unit:	Acres
Contact:	Gary Reist
Contact Title:	Director of Plant Operations
Contact Phone:	858-792-4272
Contact Phone Ext:	Not reported
Contact Email:	greist@sdfair.com
Operator Name:	22nd District Agricultural Association
Operator Address:	2260 Jimmy Durante Blvd
Operator City:	Del Mar
Operator State:	California
Operator Zip:	92014

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PREMIER FOOD SERVICES (Continued) **S104745683**

Operator Contact:	Gary Reist
Operator Contact Title:	Director of Plant Operations
Operator Contact Phone:	858-792-4202
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	greist@sdfair.com
Operator Type:	Special District
Developer:	Del Mar Thoroughbred Club
Developer Address:	2260 Jimmy Durante Blvd
Developer City:	Del Mar
Developer State:	California
Developer Zip:	92014
Developer Contact:	Gary Reist
Developer Contact Title:	Director of Plant Operations
Constype Linear Utility Ind:	N
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	N
Constype Below Ground Ind:	N
Constype Cable Line Ind:	N
Constype Comm Line Ind:	N
Constype Commertial Ind:	Y
Constype Electrical Line Ind:	N
Constype Gas Line Ind:	N
Constype Industrial Ind:	N
Constype Other Description:	Not reported
Constype Other Ind:	N
Constype Recons Ind:	N
Constype Residential Ind:	N
Constype Transport Ind:	N
Constype Utility Description:	Not reported
Constype Utility Ind:	N
Constype Water Sewer Ind:	N
Dir Discharge Uswater Ind:	N
Receiving Water Name:	San Diego River
Certifier:	Gary Reist
Certifier Title:	Not reported
Certification Date:	31-JUL-13
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

Name:	DEL MAR FAIRGROUNDS HABITAT RESTORATION
Address:	2260 JIMMY DURANTE BLVD
City,State,Zip:	DEL MAR, CA 92014
Facility Status:	Not reported
NPDES Number:	Not reported
Region:	Not reported
Agency Number:	Not reported
Regulatory Measure ID:	Not reported
Place ID:	Not reported
Order Number:	Not reported
WDID:	9 37C343985
Regulatory Measure Type:	Construction
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	Not reported
Discharge Name:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Status:	Terminated
Status Date:	04/15/2019
Operator Name:	22nd District Agricultural Association
Operator Address:	2260 Jimmy Durante Blvd
Operator City:	Del Mar
Operator State:	California
Operator Zip:	92014

NPDES as of 03/2018:

NPDES Number:	CAS000002
Status:	Active
Agency Number:	0
Region:	9
Regulatory Measure ID:	312832
Order Number:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	9 37C343985
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	10/13/2006
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	22nd District Agricultural Association
Discharge Address:	2260 Jimmy Durante Blvd
Discharge City:	Del Mar
Discharge State:	California
Discharge Zip:	92014
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	9
Regulatory Measure ID:	312832
Order Number:	Not reported
Regulatory Measure Type:	Construction
Place ID:	Not reported
WDID:	9 37C343985
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	05/09/2008
Processed Date:	10/13/2006
Status:	Active
Status Date:	10/13/2006

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PREMIER FOOD SERVICES (Continued) **S104745683**

Place Size:	4.94
Place Size Unit:	Acres
Contact:	Rebecca Bartling
Contact Title:	Deputy General Manager
Contact Phone:	858-792-4202
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	22nd District Agricultural Association
Operator Address:	2260 Jimmy Durante Blvd
Operator City:	Del Mar
Operator State:	California
Operator Zip:	92014
Operator Contact:	Rebecca Bartling
Operator Contact Title:	Deputy General Manager
Operator Contact Phone:	858-792-4202
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	rbartling@sdfair.com
Operator Type:	Special District
Developer:	22nd District Agricultural Association
Developer Address:	2260 Jimmy Durante Blvd
Developer City:	Del Mar
Developer State:	California
Developer Zip:	92014
Developer Contact:	Rebecca Bartling
Developer Contact Title:	Deputy General Manager
Constype Linear Utility Ind:	N
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	N
Constype Below Ground Ind:	N
Constype Cable Line Ind:	N
Constype Comm Line Ind:	N
Constype Commertial Ind:	N
Constype Electrical Line Ind:	N
Constype Gas Line Ind:	N
Constype Industrial Ind:	N
Constype Other Description:	Not reported
Constype Other Ind:	N
Constype Recons Ind:	N
Constype Residential Ind:	N
Constype Transport Ind:	N
Constype Utility Description:	Not reported
Constype Utility Ind:	N
Constype Water Sewer Ind:	N
Dir Discharge Uswater Ind:	Y
Receiving Water Name:	San Dieguito River
Certifier:	Gary Reist
Certifier Title:	Not reported
Certification Date:	26-JUN-10
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

Name:	DEL MAR FAIRGROUNDS PHASE II STORMWATER IMPROVEMENTS
Address:	2260 JIMMY DURANTE BLVD
City,State,Zip:	DEL MAR, CA 92014

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PREMIER FOOD SERVICES (Continued) **S104745683**

Facility Status:	Active
NPDES Number:	CAS000002
Region:	9
Agency Number:	0
Regulatory Measure ID:	497334
Place ID:	Not reported
Order Number:	2009-0009-DWQ
WDID:	9 37C383650
Regulatory Measure Type:	Enrollee
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	06/13/2018
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	2260 Jimmy Durante Blvd
Discharge Name:	22nd District Agricultural Association
Discharge City:	Del Mar
Discharge State:	California
Discharge Zip:	92014
Status:	Not reported
Status Date:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported

Name:	TURF TRACK EXPANSION
Address:	2260 JIMMY DURANTE BLVD
City,State,Zip:	DEL MAR, CA 92014
Facility Status:	Terminated
NPDES Number:	CAS000002
Region:	9
Agency Number:	0
Regulatory Measure ID:	439924
Place ID:	Not reported
Order Number:	2009-0009-DWQ
WDID:	9 37C367399
Regulatory Measure Type:	Enrollee
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	08/12/2013
Termination Date Of Regulatory Measure:	10/18/2019
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	2260 Jimmy Durante Blvd
Discharge Name:	22nd District Agricultural Association
Discharge City:	Del Mar
Discharge State:	California
Discharge Zip:	92014
Status:	Not reported
Status Date:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

NPDES as of 03/2018:

NPDES Number:	CAS000002
Status:	Active
Agency Number:	0
Region:	9
Regulatory Measure ID:	439924
Order Number:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	9 37C367399
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	08/12/2013
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	22nd District Agricultural Association
Discharge Address:	2260 Jimmy Durante Blvd
Discharge City:	Del Mar
Discharge State:	California
Discharge Zip:	92014
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	9
Regulatory Measure ID:	439924
Order Number:	Not reported
Regulatory Measure Type:	Construction
Place ID:	Not reported
WDID:	9 37C367399
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	07/31/2013
Processed Date:	08/12/2013
Status:	Active
Status Date:	08/12/2013
Place Size:	75.7
Place Size Unit:	Acres
Contact:	Gary Reist
Contact Title:	Director of Plant Operations
Contact Phone:	858-792-4272
Contact Phone Ext:	Not reported
Contact Email:	greist@sdfair.com
Operator Name:	22nd District Agricultural Association
Operator Address:	2260 Jimmy Durante Blvd
Operator City:	Del Mar
Operator State:	California
Operator Zip:	92014
Operator Contact:	Gary Reist
Operator Contact Title:	Director of Plant Operations

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PREMIER FOOD SERVICES (Continued) **S104745683**

Operator Contact Phone:	858-792-4202
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	greist@sdfair.com
Operator Type:	Special District
Developer:	Del Mar Thoroughbred Club
Developer Address:	2260 Jimmy Durante Blvd
Developer City:	Del Mar
Developer State:	California
Developer Zip:	92014
Developer Contact:	Gary Reist
Developer Contact Title:	Director of Plant Operations
Constype Linear Utility Ind:	N
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	N
Constype Below Ground Ind:	N
Constype Cable Line Ind:	N
Constype Comm Line Ind:	N
Constype Commertial Ind:	Y
Constype Electrical Line Ind:	N
Constype Gas Line Ind:	N
Constype Industrial Ind:	N
Constype Other Description:	Not reported
Constype Other Ind:	N
Constype Recons Ind:	N
Constype Residential Ind:	N
Constype Transport Ind:	N
Constype Utility Description:	Not reported
Constype Utility Ind:	N
Constype Water Sewer Ind:	N
Dir Discharge Uswater Ind:	N
Receiving Water Name:	San Diego River
Certifier:	Gary Reist
Certifier Title:	Not reported
Certification Date:	31-JUL-13
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

Name:	DEL MAR FAIRGROUNDS RACETRACK
Address:	2260 JIMMY DURANTE BLVD
City,State,Zip:	DEL MAR, CA 92014
Facility Status:	Not reported
NPDES Number:	Not reported
Region:	Not reported
Agency Number:	Not reported
Regulatory Measure ID:	Not reported
Place ID:	Not reported
Order Number:	Not reported
WDID:	9 37I001942
Regulatory Measure Type:	Industrial
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Discharge Address:	Not reported
Discharge Name:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Status:	Active
Status Date:	02/21/2008
Operator Name:	22nd District Agricultural Association
Operator Address:	2260 Jimmy Durante Blvd
Operator City:	Del Mar
Operator State:	California
Operator Zip:	92014

NPDES as of 03/2018:

NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	9
Regulatory Measure ID:	218202
Order Number:	Not reported
Regulatory Measure Type:	Industrial
Place ID:	Not reported
WDID:	9 37I001942
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	05/01/2009
Processed Date:	02/03/1993
Status:	Active
Status Date:	02/21/2008
Place Size:	356
Place Size Unit:	Acres
Contact:	Gary Reist
Contact Title:	Chief Plant Operations
Contact Phone:	858-792-4272
Contact Phone Ext:	4272
Contact Email:	greist@sdfair.com
Operator Name:	22nd District Agricultural Association
Operator Address:	2260 Jimmy Durante Blvd
Operator City:	Del Mar
Operator State:	California
Operator Zip:	92014
Operator Contact:	Gary Reist
Operator Contact Title:	Chief Plant Operations
Operator Contact Phone:	858-792-4272
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	greist@sdfair.com
Operator Type:	Special District
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Developer State:	California
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	858-792-4271
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Y
Receiving Water Name:	San Dieguito Lagoon/River and Stevens Creek
Certifier:	Gary Reist
Certifier Title:	Chief Plant Operations
Certification Date:	03-JUN-15
Primary Sic:	9999-Nonclassifiable Establishments
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	CAS000001
Status:	Active
Agency Number:	0
Region:	9
Regulatory Measure ID:	218202
Order Number:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	9 37I001942
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	02/03/1993
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	22nd District Agricultural Association
Discharge Address:	2260 Jimmy Durante Blvd
Discharge City:	Del Mar
Discharge State:	California
Discharge Zip:	92014
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

Name:	DEL MAR FAIRGROUNDS RACETRACK
Address:	2260 JIMMY DURANTE BLVD
City,State,Zip:	DEL MAR, CA 92014
Facility Status:	Active
NPDES Number:	CAS000001

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PREMIER FOOD SERVICES (Continued) **S104745683**

Region:	9
Agency Number:	0
Regulatory Measure ID:	218202
Place ID:	Not reported
Order Number:	97-03-DWQ
WDID:	9 37I001942
Regulatory Measure Type:	Enrollee
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	02/03/1993
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	2260 Jimmy Durante Blvd
Discharge Name:	22nd District Agricultural Association
Discharge City:	Del Mar
Discharge State:	California
Discharge Zip:	92014
Status:	Not reported
Status Date:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported

NPDES as of 03/2018:

NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	9
Regulatory Measure ID:	218202
Order Number:	Not reported
Regulatory Measure Type:	Industrial
Place ID:	Not reported
WDID:	9 37I001942
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	05/01/2009
Processed Date:	02/03/1993
Status:	Active
Status Date:	02/21/2008
Place Size:	356
Place Size Unit:	Acres
Contact:	Gary Reist
Contact Title:	Chief Plant Operations
Contact Phone:	858-792-4272
Contact Phone Ext:	4272
Contact Email:	greist@sdfair.com
Operator Name:	22nd District Agricultural Association
Operator Address:	2260 Jimmy Durante Blvd

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PREMIER FOOD SERVICES (Continued) **S104745683**

Operator City:	Del Mar
Operator State:	California
Operator Zip:	92014
Operator Contact:	Gary Reist
Operator Contact Title:	Chief Plant Operations
Operator Contact Phone:	858-792-4272
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	greist@sdfair.com
Operator Type:	Special District
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	California
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	858-792-4271
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Y
Receiving Water Name:	San Dieguito Lagoon/River and Stevens Creek
Certifier:	Gary Reist
Certifier Title:	Chief Plant Operations
Certification Date:	03-JUN-15
Primary Sic:	9999-Nonclassifiable Establishments
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

NPDES Number:	CAS000001
Status:	Active
Agency Number:	0
Region:	9
Regulatory Measure ID:	218202
Order Number:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	9 37I001942
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	02/03/1993
Expiration Date Of Regulatory Measure:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	22nd District Agricultural Association
Discharge Address:	2260 Jimmy Durante Blvd
Discharge City:	Del Mar
Discharge State:	California
Discharge Zip:	92014
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Certifier Title: Not reported
Certification Date: Not reported
Primary Sic: Not reported
Secondary Sic: Not reported
Tertiary Sic: Not reported

CIWQS:
Name: DEL MAR FAIRGROUNDS PHASE II STORMWATER IMPROVEMENTS
Address: 2260 JIMMY DURANTE BLVD
City,State,Zip: DEL MAR, CA 92014
Agency: 22nd District Agricultural Association
Agency Address: 2260 Jimmy Durante Blvd, Del Mar, CA 92014
Place/Project Type: Construction - Utility: Storm Drain Improvements
SIC/NAICS: Not reported
Region: 9
Program: CONSTW
Regulatory Measure Status: Active
Regulatory Measure Type: Storm water construction
Order Number: 2009-0009-DWQ
WDID: 9 37C383650
NPDES Number: CAS000002
Adoption Date: 01/01/1900
Effective Date: 06/13/2018
Termination Date: 01/01/1900
Expiration/Review Date: 01/01/1900
Design Flow: Not reported
Major/Minor: Not reported
Complexity: Not reported
TTWQ: Not reported
Enforcement Actions within 5 years: 0
Violations within 5 years: 0
Latitude: 32.976393
Longitude: -117.262634

Name: TURF TRACK EXPANSION
Address: 2260 JIMMY DURANTE BLVD
City,State,Zip: DEL MAR, CA 92014
Agency: 22nd District Agricultural Association
Agency Address: 2260 Jimmy Durante Blvd, Del Mar, CA 92014
Place/Project Type: Construction - Commercial
SIC/NAICS: Not reported
Region: 9
Program: CONSTW
Regulatory Measure Status: Terminated
Regulatory Measure Type: Storm water construction
Order Number: 2009-0009-DWQ
WDID: 9 37C367399
NPDES Number: CAS000002
Adoption Date: 01/01/1900
Effective Date: 08/12/2013
Termination Date: 10/18/2019
Expiration/Review Date: 01/01/1900
Design Flow: Not reported
Major/Minor: Not reported
Complexity: Not reported
TTWQ: Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Enforcement Actions within 5 years: 0
Violations within 5 years: 0
Latitude: 32.979956
Longitude: -117.261077

Name: DEL MAR FAIRGROUNDS HABITAT RESTORATION
Address: 2260 JIMMY DURANTE BLVD
City,State,Zip: DEL MAR, CA 92014
Agency: 22nd District Agricultural Association
Agency Address: 2260 Jimmy Durante Blvd, Del Mar, CA 92014
Place/Project Type: Construction
SIC/NAICS: Not reported
Region: 9
Program: CONSTW
Regulatory Measure Status: Terminated
Regulatory Measure Type: Storm water construction
Order Number: 2009-0009-DWQ
WDID: 9 37C343985
NPDES Number: CAS000002
Adoption Date: 01/01/1900
Effective Date: 10/13/2006
Termination Date: 04/15/2019
Expiration/Review Date: 01/01/1900
Design Flow: Not reported
Major/Minor: Not reported
Complexity: Not reported
TTWQ: Not reported
Enforcement Actions within 5 years: 0
Violations within 5 years: 0
Latitude: 32.97363
Longitude: -117.25635

Name: DEL MAR FAIRGROUNDS RACETRACK
Address: 2260 JIMMY DURANTE BLVD
City,State,Zip: DEL MAR, CA 92014
Agency: 22nd District Agricultural Association
Agency Address: 2260 Jimmy Durante Blvd, Del Mar, CA 92014
Place/Project Type: Industrial - Nonclassifiable Establishments
SIC/NAICS: 9999
Region: 9
Program: INDSTW
Regulatory Measure Status: Active
Regulatory Measure Type: Storm water industrial
Order Number: 2014-0057-DWQ
WDID: 9 37I001942
NPDES Number: CAS000001
Adoption Date: 01/01/1900
Effective Date: 02/03/1993
Termination Date: 01/01/1900
Expiration/Review Date: 01/01/1900
Design Flow: Not reported
Major/Minor: Not reported
Complexity: Not reported
TTWQ: Not reported
Enforcement Actions within 5 years: 0
Violations within 5 years: 0
Latitude: 32.9703

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PREMIER FOOD SERVICES (Continued) **S104745683**

Longitude: -117.26317

CERS:
Name: DEL MAR RACE TRACK/FAIRGROUNDS
Address: 2260 JIMMY DURANTE BLVD
City,State,Zip: DEL MAR, CA 92014
Site ID: 312631
CERS ID: 219461
CERS Description: Unregulated

Name: DEL MAR FAIRGROUNDS PHASE II STORMWATER IMPROVEMENTS
Address: 2260 JIMMY DURANTE BLVD
City,State,Zip: DEL MAR, CA 92014
Site ID: 530382
CERS ID: 863754
CERS Description: Construction Storm Water

Evaluation:
Eval General Type: Other/Unknown
Eval Date: 06-20-2019
Violations Found: No
Eval Type: Construction Storm Water Compliance Evaluation
Eval Notes: Inspection report is pending
Eval Division: Water Boards
Eval Program: CONSTW
Eval Source: SMARTS

Affiliation:
Affiliation Type Desc: Owner/Operator
Entity Name: 22nd District Agricultural Association
Entity Title: Operator
Affiliation Address: 2260 Jimmy Durante Blvd
Affiliation City: Del Mar
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92014
Affiliation Phone: Not reported

Name: DEL MAR FAIRGROUNDS RACETRACK
Address: 2260 JIMMY DURANTE BLVD
City,State,Zip: DEL MAR, CA 92014
Site ID: 530383
CERS ID: 219452
CERS Description: Industrial Facility Storm Water

Violations:
Site ID: 530383
Site Name: Del Mar Fairgrounds Racetrack
Violation Date: 09-09-2002
Citation: 2014-0057-DWQ - Industrial General Permit
Violation Description: SW - Deficient BMP Implementation
Violation Notes: Failure to implement adequate storm water BMPs and prohibit illicit discharge
Violation Division: Water Boards
Violation Program: INDSTW
Violation Source: SMARTS

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PREMIER FOOD SERVICES (Continued) **S104745683**

Site ID: 530383
Site Name: Del Mar Fairgrounds Racetrack
Violation Date: 08-22-2007
Citation: 2014-0057-DWQ - Industrial General Permit
Violation Description: Unauthorized Discharge
Violation Notes: A horsewash station at the Horsepark is directly connected to the San Dieguito River (for discharges of waste water and storm water).
Violation Division: Water Boards
Violation Program: INDSTW
Violation Source: SMARTS

Site ID: 530383
Site Name: Del Mar Fairgrounds Racetrack
Violation Date: 08-29-2003
Citation: 2014-0057-DWQ - Industrial General Permit
Violation Description: SW - Deficient BMP Implementation
Violation Notes: Inadequate BMPs at Fairgrounds and Horsepark. Fairgrounds had uncovered stockpiles, trash on bank of the river; Horsepark had portable toilets adjacent to storm drains and manure on bank of the river.
Violation Division: Water Boards
Violation Program: INDSTW
Violation Source: SMARTS

Evaluation:
Eval General Type: Other/Unknown
Eval Date: 06-20-2019
Violations Found: No
Eval Type: Construction Storm Water Compliance Evaluation
Eval Notes: Inspection report is pending
Eval Division: Water Boards
Eval Program: INDSTW
Eval Source: SMARTS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-22-2001
Violations Found: No
Eval Type: Industrial Storm Water Compliance Evaluation
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: INDSTW
Eval Source: SMARTS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-29-2003
Violations Found: No
Eval Type: Industrial Storm Water Compliance Evaluation
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: INDSTW
Eval Source: SMARTS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-09-2002
Violations Found: No
Eval Type: Industrial Storm Water Compliance Evaluation
Eval Notes: Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Eval Division: Water Boards
Eval Program: INDSTW
Eval Source: SMARTS

Eval General Type: Compliance Sampling Inspection
Eval Date: 09-09-2002
Violations Found: No
Eval Type: Industrial Storm Water Compliance Sampling
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: INDSTW
Eval Source: SMARTS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-13-2002
Violations Found: No
Eval Type: Industrial Storm Water Compliance Evaluation
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: INDSTW
Eval Source: SMARTS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-17-2004
Violations Found: No
Eval Type: Industrial Storm Water Compliance Evaluation
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: INDSTW
Eval Source: SMARTS

Enforcement Action:
Site ID: 530383
Site Name: Del Mar Fairgrounds Racetrack
Site Address: 2260 JIMMY DURANTE BLVD
Site City: DEL MAR
Site Zip: 92014
Enf Action Date: 05-05-2003
Enf Action Type: Industrial Storm Water Enforcement
Enf Action Description: Industrial Storm Water Enforcement
Enf Action Notes: 13267 requesting additional information on corrective actions to implement adequate BMPs
Enf Action Division: Water Boards
Enf Action Program: INDSTW
Enf Action Source: SMARTS

Site ID: 530383
Site Name: Del Mar Fairgrounds Racetrack
Site Address: 2260 JIMMY DURANTE BLVD
Site City: DEL MAR
Site Zip: 92014
Enf Action Date: 09-10-2003
Enf Action Type: Industrial Storm Water Enforcement
Enf Action Description: Industrial Storm Water Enforcement
Enf Action Notes: Verbally communicated inadequate BMPs at Fairgrounds and Horsepark.
Enf Action Division: Water Boards
Enf Action Program: INDSTW

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PREMIER FOOD SERVICES (Continued) **S104745683**

Enf Action Source: SMARTS

Site ID: 530383
Site Name: Del Mar Fairgrounds Racetrack
Site Address: 2260 JIMMY DURANTE BLVD
Site City: DEL MAR
Site Zip: 92014
Enf Action Date: 10-11-2002
Enf Action Type: Industrial Storm Water Enforcement
Enf Action Description: Industrial Storm Water Enforcement
Enf Action Notes: 13267 requesting information on storm water management at Del Mar Fairgrounds and Horsepark, resulting from violations noted in associated NOV
Enf Action Division: Water Boards
Enf Action Program: INDSTW
Enf Action Source: SMARTS

Site ID: 530383
Site Name: Del Mar Fairgrounds Racetrack
Site Address: 2260 JIMMY DURANTE BLVD
Site City: DEL MAR
Site Zip: 92014
Enf Action Date: 10-11-2002
Enf Action Type: Notice of Violation
Enf Action Description: Notice of Violation
Enf Action Notes: NOV for failure to implement adequate storm water BMPs and prohibit illicit discharges
Enf Action Division: Water Boards
Enf Action Program: INDSTW
Enf Action Source: SMARTS

Affiliation:
Affiliation Type Desc: Owner/Operator
Entity Name: 22nd District Agricultural Association
Entity Title: Operator
Affiliation Address: 2260 Jimmy Durante Blvd
Affiliation City: Del Mar
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92014
Affiliation Phone: Not reported

Name: AT&T MOBILITY - DEL MAR FAIRGROUNDS (USID113486)
Address: 2260 JIMMY DURANTE BLVD
City,State,Zip: DEL MAR, CA 92014
Site ID: 8322
CERS ID: 10589560
CERS Description: Chemical Storage Facilities

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-08-2021
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Inspector: Martinez Maria Inspection ID:6365592
Eval Division: San Diego County Department of Env Health

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PREMIER FOOD SERVICES (Continued) **S104745683**

Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	01-22-2018
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Inspector: Eivaz Chantal Inspection ID:5858216
Eval Division:	San Diego County Department of Env Health
Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	02-29-2016
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Inspector: Khan Steven Inspection ID:5446240
Eval Division:	San Diego County Department of Env Health
Eval Program:	HMRRP
Eval Source:	CERS

Coordinates:

Site ID:	8322
Facility Name:	AT&T Mobility - DEL MAR FAIRGROUNDS (USID113486)
Env Int Type Code:	HMBP
Program ID:	10589560
Coord Name:	Not reported
Ref Point Type Desc:	Center of a facility or station.
Latitude:	32.972410
Longitude:	-117.258340

Affiliation:

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	308 S. Akard St., 17th Floor
Affiliation City:	Dallas
Affiliation State:	TX
Affiliation Country:	Not reported
Affiliation Zip:	75202
Affiliation Phone:	Not reported
Affiliation Type Desc:	Identification Signer
Entity Name:	Jeremy McGrue
Entity Title:	National EPCRA Manager
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Operator
Entity Name:	AT&T Mobility
Entity Title:	Not reported
Affiliation Address:	Not reported

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PREMIER FOOD SERVICES (Continued) **S104745683**

Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(800) 566-9347
Affiliation Type Desc:	Parent Corporation
Entity Name:	AT&T Mobility
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	CUPA District
Entity Name:	San Diego County Env Health
Entity Title:	Not reported
Affiliation Address:	PO Box 129261
Affiliation City:	San Diego
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92112-9261
Affiliation Phone:	(858) 505-6880
Affiliation Type Desc:	Document Preparer
Entity Name:	Peter Burnell, Sigma Consultants, Inc.
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Environmental Contact
Entity Name:	AT&T EH&S Hotline - Option #1
Entity Title:	Not reported
Affiliation Address:	308 S. Akard St., 17th Floor
Affiliation City:	Dallas
Affiliation State:	TX
Affiliation Country:	Not reported
Affiliation Zip:	75202
Affiliation Phone:	Not reported
Affiliation Type Desc:	Legal Owner
Entity Name:	New Cingular Wireless PCS, LLC dba AT&T Mobility
Entity Title:	Not reported
Affiliation Address:	308 S. Akard St., 17th Floor
Affiliation City:	Dallas
Affiliation State:	TX
Affiliation Country:	United States
Affiliation Zip:	75202
Affiliation Phone:	(214) 464-1712

DRAFT

PREMIER FOOD SERVICES (Continued) **S104745683**

Name: PREMIER FOOD SERVICES
Address: 2260 JIMMY DURANTE BLVD STE B
City,State,Zip: DEL MAR, CA 92014
Site ID: 430877
CERS ID: 10752100
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 430877
Site Name: Premier Food Services
Violation Date: 12-07-2017
Citation: HSC 6.95 Multiple - California Health and Safety Code, Chapter 6.95, Section(s) Multiple
Violation Description: Business Plan Program - Administration/Documentation - General
Violation Notes: Returned to compliance on 04/10/2018. Inspection Sequence ID:5883970;Violation:HMD1001 Unified Program Facility permit not obtained for hazardous materials. SDCC 68.905; 68.906, 68.907
Violation Division: San Diego County Department of Env Health
Violation Program: HMRRP
Violation Source: CERS

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-07-2017
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Inspector: Rosales Jennifer Inspection ID:5883970
Eval Division: San Diego County Department of Env Health
Eval Program: HMRRP
Eval Source: CERS

Affiliation:
Affiliation Type Desc: Identification Signer
Entity Name: George Oliver
Entity Title: Safety/Maintenance Manager
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Legal Owner
Entity Name: SMG/Premier Food Services Inc.
Entity Title: Not reported
Affiliation Address: 2260 Jimmy Durante Blvd.
Affiliation City: Del Mar
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 92014
Affiliation Phone: (858) 755-6345

Affiliation Type Desc: CUPA District
Entity Name: San Diego County Env Health
Entity Title: Not reported
Affiliation Address: PO Box 129261
Affiliation City: San Diego

DRAFT

PREMIER FOOD SERVICES (Continued) **S104745683**

Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92112-9261
Affiliation Phone: (858) 505-6880

Affiliation Type Desc: Operator
Entity Name: SMG/Premier Food Services Inc.
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: (858) 755-6345

Affiliation Type Desc: Document Preparer
Entity Name: George Oliver
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Environmental Contact
Entity Name: George Oliver
Entity Title: Not reported
Affiliation Address: 2260 Jimmy Durante Blvd.
Affiliation City: Del Mar
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92014
Affiliation Phone: Not reported

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: 2260 Jimmy Durante Blvd.
Affiliation City: Del Mar
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92014
Affiliation Phone: Not reported

Affiliation Type Desc: Parent Corporation
Entity Name: Premier Foods
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Property Owner
Entity Name: 22nd DAA

DRAFT

PREMIER FOOD SERVICES (Continued) **S104745683**

Entity Title:	Not reported
Affiliation Address:	2260 Jimmy Durante Blvd.
Affiliation City:	Del Mar
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	92014
Affiliation Phone:	(858) 792-4202

HWTS:

Name:	CITY OF ENCINITAS - PUBLIC WORKS
Address:	2260 JIMMY DURANTE BLVD
Address 2:	Not reported
City,State,Zip:	DEL MAR, CA 920140000
EPA ID:	CAH777001197
Inactive Date:	03/18/2003
Create Date:	11/30/1999
Last Act Date:	11/30/1999
Mailing Name:	Not reported
Mailing Address:	505 S VULCAN AVE
Mailing Address 2:	Not reported
Mailing City,State,Zip:	ENCINITAS, CA 921240000
Owner Name:	CITY OF ENCINITAS
Owner Address:	505 S VULCAN AVE
Owner Address 2:	Not reported
Owner City,State,Zip:	ENCINITAS, CA 921240000
Contact Name:	LIN WURBS
Contact Address:	505 S VULCAN AVE
Contact Address 2:	Not reported
City,State,Zip:	ENCINITAS, CA 921240000

D14 **DEL MAIR FAIR** **LUST** **S100853677**
ESE **2260 JIMMY DURANTE BLVD** **N/A**
1/4-1/2 **DEL MAR, CA 92014**
0.454 mi.
2398 ft. **Site 3 of 3 in cluster D**

Relative:
Higher

Actual:
12 ft.

LUST REG 9:

Region:	9
Status:	Case Closed
Case Number:	9UT3584
Local Case:	H03436-001
Substance:	Unleaded Gasoline
Qty Leaked:	0
Abate Method:	Excavate and Dispose - remove contaminated soil and dispose in approved site
Local Agency:	San Diego
How Found:	Tank Closure
How Stopped:	Close Tank
Source:	Unknown
Cause:	Unknown
Lead Agency:	Local Agency
Case Type:	Soil only
Date Found:	10/30/1997
Date Stopped:	10/30/1997
Confirm Date:	/ /
Submit Workplan:	Not reported

DRAFT

DEL MAIR FAIR (Continued) **S100853677**

Prelim Assess: 01/12/1998
Desc Pollution: Not reported
Remed Plan: / /
Remed Action: Not reported
Began Monitor: Not reported
Release Date: 11/17/1997
Enforce Date: Not reported
Closed Date: 10/12/00
Enforce Type: Not reported
Pilot Program: LOP
Basin Number: 905.11
GW Depth: 6'
Beneficial Use: MUNBU
NPDES Number: Not reported
Priority: 1B
File Dispn: Administratively opened on database, however no file physically exists
Interim Remedial Actions: Not reported
Cleanup and Abatement order Number: Not reported
Waste Discharge Requirement Number: Not reported

15
SE
1/4-1/2
0.471 mi.
2485 ft.

SAN DIEGUITO WETLANDS RESTORATION **CPS-SLIC S112142812**
0 SAN DIEGUITO ROAD **CERS N/A**
DEL MAR, CA 92014

Relative:
Lower

Actual:
9 ft.

CPS-SLIC:
Name: SAN DIEGUITO WETLANDS RESTORATION
Address: 0 SAN DIEGUITO ROAD
City,State,Zip: DEL MAR, CA 92014
Region: STATE
Facility Status: Completed - Case Closed
Status Date: 09/14/2012
Global Id: T10000004144
Lead Agency: SAN DIEGO COUNTY LOP
Lead Agency Case Number: 208049-002
Latitude: 32.9699360836493
Longitude: -117.261468172073
Case Type: Cleanup Program Site
Case Worker: KH
Local Agency: SAN DIEGO COUNTY LOP
RB Case Number: Not reported
File Location: Local Agency
Potential Media Affected: Not reported
Potential Contaminants of Concern: Not reported
Site History: On May 5, 2012, Southern California Edison Company (SCE) was digging test holes to evaluate slope stability as part of the revetment project on the southwest bank of the San Dieguito River project. This project begins approximately 150 feet southeast of the Jimmy Durante Bridge and continues 550 feet to the southeast. One of the test holes they encountered a potential hydrocarbons release which resulted in staff of the San Diego County Department of Environmental Health (DEH) visiting the site on May 7, 2012. This case was opened so that DEH could provided oversight and review. Subsequent investigation did not identify evidence of a hydrocarbon release. There was no visual observation of soil staining, or free-phase sheen on infiltrated groundwater in the test pit, and no characteristic odors of fuel hydrocarbon were detected. Observed in all excavations was the

DRAFT

SAN DIEGUITO WETLANDS RESTORATION (Continued) **S112142812**

presence of asphaltic demolition wastes (ADWs). The origin of the ADW is likely from emergency river bank restoration efforts following severe flood erosion of the San Dieguito Riverbend bank in 1982. Approximately 170 tons of demolition wastes (cement & asphalt) have been recovered and sent for recycling during the construction of the revetment.

Click here to access the California GeoTracker records for this facility:

CERS:

Name:	SAN DIEGUITO WETLANDS RESTORATION
Address:	0 SAN DIEGUITO ROAD
City,State,Zip:	DEL MAR, CA 92014
Site ID:	232138
CERS ID:	T10000004144
CERS Description:	Cleanup Program Site

Affiliation:

Affiliation Type Desc:	Local Agency Caseworker
Entity Name:	KEVIN HEATON - SAN DIEGO COUNTY LOP
Entity Title:	Not reported
Affiliation Address:	P.O. Box 129261
Affiliation City:	San Diego
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

---

16 **DEL MAR THOROUGHBRED CLUB** **LUST** **S100726712**
ESE **DEL MAR RACE TRACK** **CPS-SLIC** **N/A**
1/4-1/2 **DEL MAR, CA 92014** **AST**
0.484 mi. **SWEEPS UST**
2556 ft. **Cortese**
CERS

Relative: Higher

Actual: 15 ft.

LUST:

Name:	DEL MAR THOROUGHBRED CLUB
Address:	NONE DEL MAR RACE TRACK
City,State,Zip:	DEL MAR, CA 92014
Lead Agency:	SAN DIEGO COUNTY LOP
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0607301447
Global Id:	T0607301447
Latitude:	32.9751404760262
Longitude:	-117.257694533891
Status:	Completed - Case Closed
Status Date:	09/26/2000
Case Worker:	Not reported
RB Case Number:	9UT2696
Local Agency:	Not reported
File Location:	Local Agency
Local Case Number:	H04644-003
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Diesel
Site History:	Not reported

LUST:

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100726712**

Global Id: T0607301447
Action Type: ENFORCEMENT
Date: 09/26/2000
Action: Closure/No Further Action Letter

Global Id: T0607301447
Action Type: ENFORCEMENT
Date: 07/12/1993
Action: Notice of Responsibility

Global Id: T0607301447
Action Type: Other
Date: 07/06/1993
Action: Leak Began

Global Id: T0607301447
Action Type: Other
Date: 07/06/1993
Action: Leak Discovery

Global Id: T0607301447
Action Type: Other
Date: 07/06/1993
Action: Leak Stopped

Global Id: T0607301447
Action Type: Other
Date: 07/06/1993
Action: Leak Reported

LUST:
Global Id: T0607301447
Status: Open - Case Begin Date
Status Date: 07/06/1993

Global Id: T0607301447
Status: Completed - Case Closed
Status Date: 09/26/2000

Name: DEL MAR THOROUGHBRED CLUB
Address: NONE DEL MAR RACE TRACK
City,State,Zip: DEL MAR, CA 92014
Lead Agency: SAN DIEGO COUNTY LOP
Case Type: LUST Cleanup Site
Geo Track: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0607303013
Global Id: T0607303013
Latitude: 32.9746220462988
Longitude: -117.258861834397
Status: Completed - Case Closed
Status Date: 09/26/2000
Case Worker: Not reported
RB Case Number: 9UT756
Local Agency: Not reported
File Location: Local Agency
Local Case Number: H04644-001
Potential Media Affect: Other Groundwater (uses other than drinking water)

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100726712**

Potential Contaminants of Concern: Gasoline
Site History: Not reported

LUST:
Global Id: T0607303013
Action Type: ENFORCEMENT
Date: 09/26/2000
Action: Closure/No Further Action Letter

Global Id: T0607303013
Action Type: ENFORCEMENT
Date: 06/30/1987
Action: Notice of Responsibility

Global Id: T0607303013
Action Type: Other
Date: 07/01/1987
Action: Leak Began

Global Id: T0607303013
Action Type: Other
Date: 07/01/1987
Action: Leak Discovery

Global Id: T0607303013
Action Type: Other
Date: 07/09/1987
Action: Leak Stopped

Global Id: T0607303013
Action Type: Other
Date: 07/09/1987
Action: Leak Reported

LUST:
Global Id: T0607303013
Status: Open - Case Begin Date
Status Date: 06/30/1987

Global Id: T0607303013
Status: Completed - Case Closed
Status Date: 09/26/2000

CPS-SLIC:
Name: DEL MAR THOROUGHBRED CLUB
Address: JIMMY DURANTE
City,State,Zip: DEL MAR, CA 92014
Region: STATE
Facility Status: **Completed - Case Closed**
Status Date: 04/27/1990
Global Id: T0608135370
Lead Agency: SAN DIEGO COUNTY LOP
Lead Agency Case Number: H04644-002
Latitude: 32.9733617078885
Longitude: -117.260211305692
Case Type: Cleanup Program Site

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100726712**

Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	Not reported
File Location:	Local Agency
Potential Media Affected:	Under Investigation
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

AST:

Name:	DEL MAR THOROUGHBRED CLUB
Address:	DEL MAR RACE TRACK
City/Zip:	DEL MAR,
Certified Unified Program Agencies:	San Diego
Owner:	DEL MAR THOROUGHBRED CLUB
Total Gallons:	8690
CERSID:	Not reported
Facility ID:	Not reported
Business Name:	Not reported
Phone:	Not reported
Fax:	Not reported
Mailing Address:	Not reported
Mailing Address City:	Not reported
Mailing Address State:	Not reported
Mailing Address Zip Code:	Not reported
Operator Name:	Not reported
Operator Phone:	Not reported
Owner Phone:	Not reported
Owner Mail Address:	Not reported
Owner State:	Not reported
Owner Zip Code:	Not reported
Owner Country:	Not reported
Property Owner Name:	Not reported
Property Owner Phone:	Not reported
Property Owner Mailing Address:	Not reported
Property Owner City:	Not reported
Property Owner Stat :	Not reported
Property Owner Zip Code:	Not reported
Property Owner Country:	Not reported
EPAID:	Not reported

SWEEPS UST:

Name:	DEL MAR THOROUGHBRED CLUB
Address:	DEL MAR RACE TRACK
City:	DEL MAR
Status:	Active
Comp Number:	4644
Number:	9
Board Of Equalization:	44-022084
Referral Date:	Not reported
Action Date:	06-26-92
Created Date:	02-29-88
Owner Tank Id:	Not reported
SWRCB Tank Id:	37-000-004644-000001
Tank Status:	A

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DEL MAR THOROUGHBRED CLUB (Continued) **S100726712**

Capacity: 2000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: P
Content: REG UNLEADED
Number Of Tanks: 2

Name: DEL MAR THOROUGHBRED CLUB
Address: DEL MAR RACE TRACK
City: DEL MAR
Status: Active
Comp Number: 4644
Number: 9
Board Of Equalization: 44-022084
Referral Date: Not reported
Action Date: 06-26-92
Created Date: 02-29-88
Owner Tank Id: Not reported
SWRCB Tank Id: 37-000-004644-000002
Tank Status: A
Capacity: 550
Active Date: Not reported
Tank Use: M.V. FUEL
STG: P
Content: OTHER
Number Of Tanks: Not reported

Name: DEL MAR THOROUGHBRED CLUB
Address: DEL MAR RACE TRACK
City: DEL MAR
Status: Not reported
Comp Number: 4644
Number: Not reported
Board Of Equalization: 44-022084
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 37-000-004644-000003
Tank Status: Not reported
Capacity: 2000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: REG UNLEADED
Number Of Tanks: 1

CORTESE:
Name: DEL MAR THOROUGHBRED CLUB
Address: NONE DEL MAR RACE TRACK
City,State,Zip: DEL MAR, CA 92014
Region: CORTESE
Envirostor Id: Not reported
Global ID: T0607303013
Site/Facility Type: LUST CLEANUP SITE
Cleanup Status: COMPLETED - CASE CLOSED
Status Date: Not reported

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100726712**

Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	active
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Active Open

Name:	DEL MAR THOROUGHBRED CLUB
Address:	NONE DEL MAR RACE TRACK
City,State,Zip:	DEL MAR, CA 92014
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	T0607301447
Site/Facility Type:	LUST CLEANUP SITE
Cleanup Status:	COMPLETED - CASE CLOSED
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	active
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Active Open

CERS:

Name:	DEL MAR THOROUGHBRED CLUB
Address:	NONE DEL MAR RACE TRACK
City,State,Zip:	DEL MAR, CA 92014
Site ID:	226774
CERS ID:	T0607301447
CERS Description:	Leaking Underground Storage Tank Cleanup Site

Name:	DEL MAR THOROUGHBRED CLUB
Address:	NONE DEL MAR RACE TRACK
City,State,Zip:	DEL MAR, CA 92014
Site ID:	226774
CERS ID:	T0607303013
CERS Description:	Leaking Underground Storage Tank Cleanup Site

Name:	DEL MAR THOROUGHBRED CLUB

DRAFT

DEL MAR THOROUGHBRED CLUB (Continued) **S100726712**

Address:	NONE DEL MAR RACE TRACK
City,State,Zip:	DEL MAR, CA 92014
Site ID:	226774
CERS ID:	T0608135370
CERS Description:	Cleanup Program Site

E17 **CAMP C.J. MILLER** **FUDS** **1024904007**
East **N/A**
1/2-1 **DEL MAR, CA**
0.523 mi.
2761 ft. **Site 1 of 2 in cluster E**

Relative: **Higher**

Actual: **12 ft.**

FUDS:

EPA Region:	9
Installation ID:	CA99799FA35700
Congressional District Number:	49
Name:	CAMP C.J. MILLER
FUDS Number:	J09CA7328
City:	DEL MAR
State:	CA
County:	SAN DIEGO
Object ID:	9158
USACE Division:	SPD
USACE District:	Los Angeles District (SPL)
Status:	Properties without projects
Current Owner:	Not reported
EMS Map Link:	https://fudsportal.usace.army.mil/ems/ems/inventory/map/map?id=62921
Eligibility:	Eligible
Has Projects:	No
NPL Status:	Not on the NPL
Property History:	Camp C.J. Miller was located at the Del Mar Fairgrounds and Racetrack in Del Mar, California. The U.S. Marine Corps occupied and used the racetrack facilities beginning in 1942. The property was (and still is) owned by the State 22 nd District Agricultural Association, who offered (loaned) the facilities to the Marine Corps for their use. Marines from the 2 nd Division out of Camp Elliot, and possibly from Camp Pendleton, camped in the horse stalls at the racetrack. They ran around the racetrack for athletic conditioning, rode horses on the track, and practiced hand-to-hand combat near the horse stables. Marine paratroopers practiced beach landings with rubber boats on the beach adjacent to the site. The Marines made no physical improvements to the site. They discontinued their use of Camp C.J. Miller in 1943. The fairgrounds and racetrack resumed operation in 1946 and the horse stalls and racetrack have been used since that time.
Project Required:	No
Feature Description:	Not reported
X Coord:	-117.25970459
Y Coord:	32.975219727000002
Latitude:	32.975000000000001
Longitude:	-117.25972222

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E18 **CAMP C.J. MILLER** **ENVIROSTOR** **S107736010**
East **N/A**
1/2-1 **DEL MAR, CA**
0.524 mi.
2767 ft. **Site 2 of 2 in cluster E**

Relative:
Higher

Actual:
12 ft.

ENVIROSTOR:

Name:	CAMP C.J. MILLER
Address:	Not reported
City,State,Zip:	DEL MAR, CA
Facility ID:	80000974
Status:	Inactive - Needs Evaluation
Status Date:	07/01/2005
Site Code:	Not reported
Site Type:	Military Evaluation
Site Type Detailed:	FUDS
Acres:	Not reported
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Not reported
Supervisor:	Douglas Bautista
Division Branch:	Cleanup Cypress
Assembly:	78
Senate:	39
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	DERA
Latitude:	32.975
Longitude:	-117.2597
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	NONE SPECIFIED
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	CA99799FA35700
Alias Type:	Federal Facility ID
Alias Name:	J09CA7328
Alias Type:	INPR
Alias Name:	80000974
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Inventory Project Report (INPR)
Completed Date:	09/21/1999
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

DRAFT

F19 **NAVY DIRIGIBLE BASE 5 ORDNANCE MAGAZINES** **UXO** **1024714152**
ESE **N/A**
1/2-1 **DEL MAR, CA**
0.940 mi.
4962 ft. **Site 1 of 2 in cluster F**

Relative:
Higher

Actual:
15 ft.

UXO:

DoD Component:	FUDS
Installation Name:	NAVY DIRIGIBLE BASE
Name:	NAVY DIRIGIBLE BASE 5 ORDNANCE MAGAZINES
Address:	Not reported
Address 2:	Not reported
City,State,Zip:	DEL MAR, CA
Site ID:	01OEW
Site Type:	Storage Area
Latitude:	32.967500
Longitude:	-117.253889

F20 **NAVY DIRIGIBLE** **ENVIROSTOR** **S107736862**
ESE **N/A**
1/2-1 **DEL MAR, CA**
0.945 mi.
4987 ft. **Site 2 of 2 in cluster F**

Relative:
Higher

Actual:
15 ft.

ENVIROSTOR:

Name:	NAVY DIRIGIBLE
Address:	Not reported
City,State,Zip:	DEL MAR, CA
Facility ID:	80000918
Status:	Inactive - Needs Evaluation
Status Date:	07/01/2005
Site Code:	Not reported
Site Type:	Military Evaluation
Site Type Detailed:	FUDS
Acres:	0
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Not reported
Supervisor:	Douglas Bautista
Division Branch:	Cleanup Cypress
Assembly:	78
Senate:	39
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	DERA
Latitude:	32.9675
Longitude:	-117.2538
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	NONE SPECIFIED
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	CA99799FA06000
Alias Type:	Federal Facility ID
Alias Name:	J09CA7237
Alias Type:	INPR
Alias Name:	80000918
Alias Type:	Envirostor ID Number

DRAFT

NAVY DIRIGIBLE (Continued) **S107736862**

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Inventory Project Report (INPR)
Completed Date:	09/29/1999
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

21
North
1/2-1
0.955 mi.
5042 ft.

Relative:
Higher

Actual:
71 ft.

ALLIANCE MINI-MART
1070 HIGHWAY 101
CRESCENT CITY, CA 92075

LUST **S101294286**
Cortese **N/A**
ENF
HIST CORTESE
Notify 65
CERS

LUST:

Name:	ALLIANCE MINIMART
Address:	1070 HIGHWAY 101, NORTH
City,State,Zip:	CRESCENT CITY, CA 95531
Lead Agency:	NORTH COAST RWQCB (REGION 1)
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0601500026
Global Id:	T0601500026
Latitude:	41.7670186404901
Longitude:	-124.193138480186
Status:	Completed - Case Closed
Status Date:	07/26/2017
Case Worker:	ZZZ
RB Case Number:	1TDN032
Local Agency:	Not reported
File Location:	Regional Board
Local Case Number:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Former UST site.

LUST:

Global Id:	T0601500026
Contact Type:	Regional Board Caseworker
Contact Name:	REGIONAL WATER BOARD SITE CLOSED
Organization Name:	NORTH COAST RWQCB (REGION 1)
Address:	5550 SKYLANE BOULEVARD, SUITE A
City:	SANTA ROSA
Email:	Not reported
Phone Number:	7075762220

LUST:

Global Id:	T0601500026

DRAFT

ALLIANCE MINI-MART (Continued) **S101294286**

Action Type: ENFORCEMENT
Date: 05/08/2003
Action: * No Action

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 08/29/2002
Action: Staff Letter

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 04/04/2003
Action: Staff Letter

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 10/03/2014
Action: Staff Letter

Global Id: T0601500026
Action Type: RESPONSE
Date: 04/30/2004
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 05/01/2005
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 03/15/2005
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 08/01/2005
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 11/01/2011
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 02/01/2012
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 08/01/2011
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 05/15/1991

DRAFT

ALLIANCE MINI-MART (Continued) **S101294286**

Action: Notification - Proposition 65

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 08/10/2002
Action: File review

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 08/29/2002
Action: File review

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 04/04/2003
Action: File review

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 05/09/2003
Action: Meeting

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 10/23/2002
Action: File review

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 02/19/2003
Action: File review

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 01/01/1960
Action: File review

Global Id: T0601500026
Action Type: RESPONSE
Date: 05/01/2006
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 11/01/2005
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 02/01/2006
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 08/01/2006
Action: Monitoring Report - Quarterly

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ALLIANCE MINI-MART (Continued) **S101294286**

Global Id: T0601500026
Action Type: RESPONSE
Date: 11/01/2006
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 02/01/2007
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 08/17/2011
Action: Technical Correspondence / Assistance / Other

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 12/07/2010
Action: Technical Correspondence / Assistance / Other

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 09/30/2011
Action: Staff Letter

Global Id: T0601500026
Action Type: RESPONSE
Date: 06/26/2013
Action: Well Destruction Workplan - Regulator Responded

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 07/26/2017
Action: Closure/No Further Action Letter

Global Id: T0601500026
Action Type: RESPONSE
Date: 11/15/2004
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 10/03/2014
Action: Well Destruction Workplan - Regulator Responded

Global Id: T0601500026
Action Type: Other
Date: 05/20/1991
Action: Leak Discovery

Global Id: T0601500026
Action Type: Other
Date: 05/20/1991
Action: Leak Stopped

Global Id: T0601500026
Action Type: Other

DRAFT

ALLIANCE MINI-MART (Continued) **S101294286**

Date: 05/20/1991
Action: Leak Reported

Global Id: T0601500026
Action Type: RESPONSE
Date: 05/01/2007
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 10/10/2012
Action: Staff Letter

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 10/24/2013
Action: Technical Correspondence / Assistance / Other

Global Id: T0601500026
Action Type: RESPONSE
Date: 02/01/2008
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 02/01/2008
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 11/01/2008
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 08/01/2008
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 05/01/2008
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 05/09/2003
Action: Corrective Action Plan / Remedial Action Plan

Global Id: T0601500026
Action Type: RESPONSE
Date: 10/15/2003
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 08/15/2004
Action: Monitoring Report - Quarterly

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ALLIANCE MINI-MART (Continued) **S101294286**

Global Id: T0601500026
Action Type: RESPONSE
Date: 06/15/2003
Action: Corrective Action Plan / Remedial Action Plan

Global Id: T0601500026
Action Type: RESPONSE
Date: 01/15/2004
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 04/15/2003
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 07/15/2002
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 10/15/2002
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 02/10/2003
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: RESPONSE
Date: 07/15/2003
Action: Monitoring Report - Quarterly

Global Id: T0601500026
Action Type: REMEDIATION
Date: 05/01/2007
Action: In Situ Physical/Chemical Treatment (other than SVE)

Global Id: T0601500026
Action Type: REMEDIATION
Date: 04/28/2006
Action: Not reported

Global Id: T0601500026
Action Type: REMEDIATION
Date: 04/28/2006
Action: Not reported

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 03/27/2013
Action: Technical Correspondence / Assistance / Other

Global Id: T0601500026
Action Type: ENFORCEMENT

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ALLIANCE MINI-MART (Continued) **S101294286**

Date: 02/17/2009
Action: 13267 Monitoring Program

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 08/01/2013
Action: Notification - Public Notice of Case Closure

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 07/21/2009
Action: File review

Global Id: T0601500026
Action Type: ENFORCEMENT
Date: 01/07/2014
Action: Staff Letter

LUST:
Global Id: T0601500026
Status: Open - Case Begin Date
Status Date: 05/15/1991

Global Id: T0601500026
Status: Open - Site Assessment
Status Date: 06/01/1991

Global Id: T0601500026
Status: Open - Site Assessment
Status Date: 02/10/1992

Global Id: T0601500026
Status: Open - Site Assessment
Status Date: 06/10/1992

Global Id: T0601500026
Status: Open - Site Assessment
Status Date: 08/18/1992

Global Id: T0601500026
Status: Open - Site Assessment
Status Date: 11/08/2001

Global Id: T0601500026
Status: Open - Site Assessment
Status Date: 02/10/2003

Global Id: T0601500026
Status: Open - Site Assessment
Status Date: 04/11/2003

Global Id: T0601500026
Status: Open - Remediation
Status Date: 05/09/2003

Global Id: T0601500026
Status: Open - Remediation

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ALLIANCE MINI-MART (Continued) **S101294286**

Status Date: 01/12/2004

Global Id: T0601500026
Status: Open - Remediation
Status Date: 01/15/2004

Global Id: T0601500026
Status: Open - Verification Monitoring
Status Date: 12/04/2006

Global Id: T0601500026
Status: Open - Remediation
Status Date: 05/01/2007

Global Id: T0601500026
Status: Open - Eligible for Closure
Status Date: 07/29/2013

Global Id: T0601500026
Status: Completed - Case Closed
Status Date: 07/26/2017

LUST REG 1:
Region: 1
Facility ID: 1TDN032
Staff Initials: LMB

CORTESE:
Name: ALLIANCE MINIMART
Address: 1070 HIGHWAY 101, NORTH
City,State,Zip: CRESCENT CITY, CA 95531
Region: CORTESE
Envirostor Id: Not reported
Global ID: T0601500026
Site/Facility Type: LUST CLEANUP SITE
Cleanup Status: COMPLETED - CASE CLOSED
Status Date: Not reported
Site Code: Not reported
Latitude: Not reported
Longitude: Not reported
Owner: Not reported
Enf Type: Not reported
Swat R: Not reported
Flag: active
Order No: Not reported
Waste Discharge System No: Not reported
Effective Date: Not reported
Region 2: Not reported
WID Id: Not reported
Solid Waste Id No: Not reported
Waste Management Uit Name: Not reported
File Name: Active Open

ENF:
Name: ALLIANCE MINI-MART

DRAFT

ALLIANCE MINI-MART (Continued) **S101294286**

Address:	1070 HIGHWAY 101
City,State,Zip:	CRESCENT CITY, CA 92075
Region:	1
Facility Id:	205144
Agency Name:	Not reported
Place Type:	Service/Commercial
Place Subtype:	Gasoline Service Station
Facility Type:	All other facilities
Agency Type:	Not reported
# Of Agencies:	Not reported
Place Latitude:	32.99134
Place Longitude:	-117.27183
SIC Code 1:	Not reported
SIC Desc 1:	Not reported
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Enf Action
Design Flow:	Not reported
Threat To Water Quality:	Not reported
Complexity:	Not reported
Pretreatment:	Not reported
Facility Waste Type:	Not reported
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	Not reported
Program Category1:	Not reported
Program Category2:	TANKS
# Of Programs:	Not reported
WDID:	Not reported
Reg Measure Id:	Not reported
Reg Measure Type:	Not reported
Region:	Not reported
Order #:	Not reported
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	Not reported
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Not reported
Status Date:	Not reported
Effective Date:	Not reported
Expiration/Review Date:	Not reported
Termination Date:	Not reported
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported

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ALLIANCE MINI-MART (Continued) **S101294286**

WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	Not reported
Individual/General:	Not reported
Fee Code:	Not reported
Direction/Voice:	Not reported
Enforcement Id(EID):	225467
Region:	1
Order / Resolution Number:	Not reported
Enforcement Action Type:	Staff Enforcement Letter
Effective Date:	01/24/2001
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	01/24/2001
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	Enforcement - 1A1DN032NUG Alliance Mini-Mart
Description:	REQUIRED SUBMITTAL OF LATE REPORT BY 4/10/01.
Program:	UST
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	0
Initial Assessed Amount:	0
Liability $ Amount:	0
Project $ Amount:	0
Liability $ Paid:	0
Project $ Completed:	0
Total $ Paid/Completed Amount:	0

HIST CORTESE:

edr_fname:	ALLIANCE MINIMART
edr_fadd1:	1070 101
City,State,Zip:	CRESCENT CITY, CA 95531
Region:	CORTESE
Facility County Code:	8
Reg By:	LTNKA
Reg Id:	1TDN032

NOTIFY 65:

Name:	ALLIANCE MINIMART
Address:	1070 HIGHWAY 101, NORTH
City,State,Zip:	CRESCENT CITY, CA 95531
Date Reported:	Not reported
Staff Initials:	Not reported
Board File Number:	Not reported
Facility Type:	Not reported
Discharge Date:	Not reported
Issue Date:	05/15/1991
Incident Description:	Not reported
Global ID:	Not reported
Status:	Not reported

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ALLIANCE MINI-MART (Continued) **S101294286**

CERS:
Name: ALLIANCE MINI-MART
Address: 1070 HIGHWAY 101
City,State,Zip: CRESCENT CITY, CA 92075
Site ID: 91078
CERS ID: 205144
CERS Description: Tanks & Ground Water Clean Up

Violations:
Site ID: 91078
Site Name: Alliance Mini-Mart
Violation Date: 01-18-2001
Citation: California Water Code
Violation Description: Not reported
Violation Notes: FAILURE TO SUBMIT SEMI-ANNUAL GROUNDWATER MONITORING REPORT.
Violation Division: Water Boards
Violation Program: UST
Violation Source: CIWQS

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-13-2002
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: UST
Eval Source: CIWQS

Enforcement Action:
Site ID: 91078
Site Name: Alliance Mini-Mart
Site Address: 1070 HIGHWAY 101
Site City: CRESCENT CITY
Site Zip: 92075
Enf Action Date: 01-24-2001
Enf Action Type: Staff Enforcement Letter (Informal)
Enf Action Description: Staff Enforcement Letter (Informal)
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: UST
Enf Action Source: CIWQS

Name: ALLIANCE MINIMART
Address: 1070 HIGHWAY 101, NORTH
City,State,Zip: CRESCENT CITY, CA 95531
Site ID: 247507
CERS ID: T0601500026
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Regional Board Caseworker
Entity Name: REGIONAL WATER BOARD SITE CLOSED - NORTH COAST RWQCB (REGION 1)
Entity Title: Not reported
Affiliation Address: 5550 SKYLANE BOULEVARD, SUITE A
Affiliation City: SANTA ROSA

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ALLIANCE MINI-MART (Continued) **S101294286**

Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	7075762220

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Count: 6 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
DEL MAR	S123406806	CHINO NOJO INC	5845 CALZADA DEL BOSQUE	92014	San Diego Co. HMMD
DEL MAR	S110497446	DEL MAR VEIN CARE	1555 CAM DEL MAR	92014	San Diego Co. HMMD
DEL MAR	S123406615	DEL MAR THOROUGHBRED CLUB	DEL MAR RACE TRACK	92014	San Diego Co. HMMD
DEL MAR	1026439828	SOUTHERN CALIFORNIA GAS LINE CO -	1/4 MILE SOUTH OF CAMINO DEL M	92014	FINDS
DEL MAR	1026152249	SOUTHERN CALIFORNIA GAS LINE CO -	1/4 MILE SOUTH OF CAMINO DEL M	92014	ECHO
DEL MAR	1025881909	SOUTHERN CALIFORNIA GAS LINE CO -	1/4 MILE SOUTH OF CAMINO DEL M	92014	RCRA-LQG

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GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

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Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 03/30/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

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SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

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RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 02/09/2021
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 39

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/05/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 02/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 02/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

DRAFT

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/15/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 7

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 01/25/2021
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/13/2021
Number of Days to Update: 77

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 01/25/2021
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/13/2021
Number of Days to Update: 77

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 02/08/2021
Date Data Arrived at EDR: 02/09/2021
Date Made Active in Reports: 05/03/2021
Number of Days to Update: 83

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 05/11/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

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LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)
Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21
Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35
Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30
Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29
Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22
Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

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Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/12/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land

Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/07/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

DRAFT

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 12/22/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 84

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

DRAFT

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

DRAFT

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/29/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 33
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

DRAFT

Date of Government Version: 03/05/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 04/01/2021
Number of Days to Update: 23

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 03/12/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 84

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

DRAFT

Date of Government Version: 11/12/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 12/22/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/07/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

DRAFT

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/22/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 01/25/2021
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/13/2021
Number of Days to Update: 77

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Quarterly

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing

A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 12/17/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 03/09/2021
Number of Days to Update: 82

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/11/2020
Date Data Arrived at EDR: 12/11/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/16/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

DRAFT

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 04/21/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: No Update Planned

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 03/09/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 11/23/2020
Date Data Arrived at EDR: 11/23/2020
Date Made Active in Reports: 02/08/2021
Number of Days to Update: 77

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 04/22/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: No Update Planned

DRAFT

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176
Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 04/29/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 83
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/22/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21
Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program
This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 01/25/2021
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/13/2021
Number of Days to Update: 77
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs
A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 01/20/2021
Date Made Active in Reports: 04/08/2021
Number of Days to Update: 78
Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites
Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

DRAFT

CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 01/20/2021
Date Data Arrived at EDR: 01/20/2021
Date Made Active in Reports: 04/08/2021
Number of Days to Update: 78

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 04/20/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Quarterly

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 83

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Quarterly

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 02/24/2021
Date Data Arrived at EDR: 02/24/2021
Date Made Active in Reports: 05/14/2021
Number of Days to Update: 79

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing

Aboveground storage tank sites

DRAFT

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 05/05/2021
Number of Days to Update: 83

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CERS TANKS: California Environmental Reporting System (CERS) Tanks

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 01/20/2021
Date Data Arrived at EDR: 01/20/2021
Date Made Active in Reports: 04/08/2021
Number of Days to Update: 78

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 04/20/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Quarterly

Local Land Records

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 05/20/2021
Number of Days to Update: 78

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

DRAFT

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 03/02/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 77
Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 05/28/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/16/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 85
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/24/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 01/20/2021
Date Made Active in Reports: 04/08/2021
Number of Days to Update: 78
Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 04/20/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22
Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

DRAFT

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 04/05/2021
Number of Days to Update: 47

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/16/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

DRAFT

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 04/30/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/07/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/17/2020
Date Made Active in Reports: 09/10/2020
Number of Days to Update: 85

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/19/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

DRAFT

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 08/14/2020
Date Made Active in Reports: 11/04/2020
Number of Days to Update: 82

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/17/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 01/20/2021
Date Data Arrived at EDR: 01/21/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 60

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/20/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 01/22/2021
Date Data Arrived at EDR: 02/18/2021
Date Made Active in Reports: 05/11/2021
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/19/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

DRAFT

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 03/05/2021
Number of Days to Update: 50
Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/19/2020
Date Data Arrived at EDR: 01/08/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 73
Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/11/2021
Date Made Active in Reports: 05/11/2021
Number of Days to Update: 61
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/16/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Quarterly

DRAFT

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 12/01/2020
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 70
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 05/07/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 03/25/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

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Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 01/13/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 68

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/22/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 151

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/06/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 04/28/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

DRAFT

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 11/24/2020
Date Data Arrived at EDR: 11/30/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 56

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 05/26/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

DRAFT

Date of Government Version: 02/01/2021
Date Data Arrived at EDR: 02/24/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 84

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/06/2020
Date Data Arrived at EDR: 05/27/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 78

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 12/11/2020
Date Data Arrived at EDR: 12/11/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 81

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 03/10/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/03/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 04/05/2021
Number of Days to Update: 33

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 07/02/2020
Date Made Active in Reports: 09/17/2020
Number of Days to Update: 77

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 04/13/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Varies

DRAFT

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 01/02/2021
Date Data Arrived at EDR: 01/08/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 04/06/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/17/2020
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/17/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 33

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 05/14/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 12/17/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 03/09/2021
Number of Days to Update: 82

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 05/14/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

DRAFT

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 03/04/2021
Date Made Active in Reports: 05/20/2021
Number of Days to Update: 77

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Annually

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 02/23/2021
Date Data Arrived at EDR: 02/25/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 83

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 02/26/2021
Date Data Arrived at EDR: 03/02/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 78

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 06/16/2020
Date Made Active in Reports: 08/28/2020
Number of Days to Update: 73

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 03/19/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Varies

ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 01/20/2021
Date Made Active in Reports: 04/09/2021
Number of Days to Update: 79

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 04/20/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 01/25/2021
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/13/2021
Number of Days to Update: 77

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 02/08/2021
Date Data Arrived at EDR: 02/12/2021
Date Made Active in Reports: 05/05/2021
Number of Days to Update: 82

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 05/05/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

DRAFT

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 04/15/2020
Date Made Active in Reports: 07/02/2020
Number of Days to Update: 78

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Annually

ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 02/16/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 05/07/2021
Number of Days to Update: 79

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 05/14/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 02/16/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 05/10/2021
Number of Days to Update: 82

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/14/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 01/05/2021
Date Data Arrived at EDR: 01/05/2021
Date Made Active in Reports: 03/18/2021
Number of Days to Update: 72

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 04/06/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing

A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

DRAFT

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 01/29/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 05/20/2021
Number of Days to Update: 78

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 05/28/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 02/08/2021
Date Data Arrived at EDR: 02/09/2021
Date Made Active in Reports: 05/04/2021
Number of Days to Update: 84

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 05/11/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing

A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 03/02/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 05/20/2021
Number of Days to Update: 78

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 05/28/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 03/09/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 12/10/2020
Number of Days to Update: 1

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 03/12/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: No Update Planned

UIC: UIC Listing

A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

DRAFT

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 11/19/2019
Date Data Arrived at EDR: 01/07/2020
Date Made Active in Reports: 03/09/2020
Number of Days to Update: 62

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 05/14/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: No Update Planned

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 03/19/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: No Update Planned

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing
In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

DRAFT

Date of Government Version: 03/09/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22
Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 11/30/2020
Date Data Arrived at EDR: 12/01/2020
Date Made Active in Reports: 02/12/2021
Number of Days to Update: 73
Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 05/19/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 01/20/2021
Date Data Arrived at EDR: 01/20/2021
Date Made Active in Reports: 04/08/2021
Number of Days to Update: 78
Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 04/20/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)

Produced water ponds sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)

Sampling point - public sites

DRAFT

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)

Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

PCS INACTIVE: Listing of Inactive PCS Permits

An inactive permit is a facility that has shut down or is no longer discharging.

Date of Government Version: 11/05/2014
Date Data Arrived at EDR: 01/06/2015
Date Made Active in Reports: 05/06/2015
Number of Days to Update: 120

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

HWTS: Hazardous Waste Tracking System

DTSC maintains the Hazardous Waste Tracking System that stores ID number information since the early 1980s and manifest data since 1993. The system collects both manifest copies from the generator and destination facility.

Date of Government Version: 04/08/2021
Date Data Arrived at EDR: 04/09/2021
Date Made Active in Reports: 04/20/2021
Number of Days to Update: 11

Source: Department of Toxic Substances Control
Telephone: 916-324-2444
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System

Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

PCS: Permit Compliance System

PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

PCS ENF: Enforcement data

No description is available for this data

DRAFT

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

DRAFT

RGA LF: Recovered Government Archive Solid Waste Facilities List
The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank
The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites
A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks
Underground storage tank sites located in Alameda county.

Date of Government Version: 03/17/2021
Date Data Arrived at EDR: 03/18/2021
Date Made Active in Reports: 03/25/2021
Number of Days to Update: 7

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 03/17/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 02/02/2021
Date Data Arrived at EDR: 02/04/2021
Date Made Active in Reports: 04/23/2021
Number of Days to Update: 78

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

BUTTE COUNTY:

DRAFT

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 12/15/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 12/24/2020
Number of Days to Update: 8

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/06/2020
Date Data Arrived at EDR: 04/23/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 78

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 01/25/2021
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/16/2021
Number of Days to Update: 80

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 04/20/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 12/17/2020
Date Data Arrived at EDR: 01/28/2021
Date Made Active in Reports: 04/16/2021
Number of Days to Update: 78

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 04/21/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

EL DORADO COUNTY:

DRAFT

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 02/09/2021
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 05/05/2021
Number of Days to Update: 83

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 05/05/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 01/14/2021
Date Data Arrived at EDR: 01/15/2021
Date Made Active in Reports: 04/05/2021
Number of Days to Update: 80

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 04/01/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 05/17/2021
Date Data Arrived at EDR: 05/18/2021
Date Made Active in Reports: 05/20/2021
Number of Days to Update: 2

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 05/10/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 01/19/2021
Date Data Arrived at EDR: 01/20/2021
Date Made Active in Reports: 04/08/2021
Number of Days to Update: 78

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INYO COUNTY:

DRAFT

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 05/11/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

KERN COUNTY:

CUPA KERN: CUPA Facility List
A listing of sites included in the Kern County Hazardous Material Business Plan.

Date of Government Version: 10/29/2020
Date Data Arrived at EDR: 10/30/2020
Date Made Active in Reports: 01/15/2021
Number of Days to Update: 77

Source: Kern County Public Health
Telephone: 661-321-3000
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 01/19/2021
Date Data Arrived at EDR: 01/21/2021
Date Made Active in Reports: 01/28/2021
Number of Days to Update: 7

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 12/03/2020
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/14/2021
Number of Days to Update: 78

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 02/10/2021
Date Data Arrived at EDR: 02/12/2021
Date Made Active in Reports: 03/11/2021
Number of Days to Update: 27

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 04/07/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Varies

LASSEN COUNTY:

DRAFT

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 07/31/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 80

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 03/12/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 01/11/2021
Date Data Arrived at EDR: 01/12/2021
Date Made Active in Reports: 03/25/2021
Number of Days to Update: 72

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 01/11/2021
Date Data Arrived at EDR: 01/12/2021
Date Made Active in Reports: 03/26/2021
Number of Days to Update: 73

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 04/13/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2021
Date Data Arrived at EDR: 02/18/2021
Date Made Active in Reports: 05/10/2021
Number of Days to Update: 81

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 04/07/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 03/26/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

DRAFT

LOS ANGELES CO LF METHANE: Methane Producing Landfills

This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 02/04/2021
Date Data Arrived at EDR: 04/16/2021
Date Made Active in Reports: 04/21/2021
Number of Days to Update: 5

Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 04/16/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory

A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 03/26/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory

A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 03/26/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 10/19/2020
Date Data Arrived at EDR: 01/12/2021
Date Made Active in Reports: 03/26/2021
Number of Days to Update: 73

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 04/16/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 04/07/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

DRAFT

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 09/11/2020
Date Data Arrived at EDR: 10/07/2020
Date Made Active in Reports: 12/23/2020
Number of Days to Update: 77

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 72

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 03/25/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Semi-Annually

MENDOCINO COUNTY:

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 12/21/2020
Date Data Arrived at EDR: 12/21/2020
Date Made Active in Reports: 03/10/2021
Number of Days to Update: 79

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 02/04/2021
Date Data Arrived at EDR: 02/09/2021
Date Made Active in Reports: 02/18/2021
Number of Days to Update: 9

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

MONO COUNTY:

DRAFT

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 03/02/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 78

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/3021
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 01/08/2021
Date Data Arrived at EDR: 01/12/2021
Date Made Active in Reports: 03/25/2021
Number of Days to Update: 72

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 03/25/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 09/05/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 10/31/2019
Number of Days to Update: 52

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 02/03/2021
Date Data Arrived at EDR: 02/04/2021
Date Made Active in Reports: 04/23/2021
Number of Days to Update: 78

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 04/21/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

DRAFT

Date of Government Version: 02/01/2021
Date Data Arrived at EDR: 02/04/2021
Date Made Active in Reports: 04/23/2021
Number of Days to Update: 78

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 04/29/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/12/2021
Number of Days to Update: 9

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 04/29/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 02/01/2021
Date Data Arrived at EDR: 02/02/2021
Date Made Active in Reports: 04/20/2021
Number of Days to Update: 77

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 04/30/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 11/24/2020
Date Data Arrived at EDR: 11/24/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 1

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 01/13/2021
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 03/10/2021
Number of Days to Update: 55

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/15/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Quarterly

DRAFT

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 01/13/2021
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 03/10/2021
Number of Days to Update: 55
Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/15/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 02/18/2020
Date Data Arrived at EDR: 03/31/2020
Date Made Active in Reports: 06/15/2020
Number of Days to Update: 76
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 02/24/2020
Date Data Arrived at EDR: 03/31/2020
Date Made Active in Reports: 06/17/2020
Number of Days to Update: 78
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 04/01/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List
Cupa facility list

Date of Government Version: 04/28/2021
Date Data Arrived at EDR: 04/29/2021
Date Made Active in Reports: 05/03/2021
Number of Days to Update: 4
Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 11/16/2020
Date Data Arrived at EDR: 11/18/2020
Date Made Active in Reports: 02/04/2021
Number of Days to Update: 78
Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

DRAFT

HMMD SAN DIEGO: Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 03/02/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 05/21/2021
Number of Days to Update: 79

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 05/28/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 11/23/2020
Date Made Active in Reports: 02/08/2021
Number of Days to Update: 77

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing

A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/14/2020
Date Data Arrived at EDR: 07/16/2020
Date Made Active in Reports: 09/29/2020
Number of Days to Update: 75

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

SAN DIEGO CO SAM: Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

CUPA SAN FRANCISCO CO: CUPA Facility Listing

Cupa facilities

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 05/05/2021
Number of Days to Update: 83

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

LUST SAN FRANCISCO: Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

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Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 05/05/2021
Number of Days to Update: 83

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 03/12/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 05/07/2021
Date Data Arrived at EDR: 05/11/2021
Date Made Active in Reports: 05/14/2021
Number of Days to Update: 3

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 05/06/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 02/20/2020
Date Data Arrived at EDR: 02/20/2020
Date Made Active in Reports: 04/24/2020
Number of Days to Update: 64

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/12/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/08/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

DRAFT

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 02/24/2021
Date Data Arrived at EDR: 02/26/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 82

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 01/26/2021
Number of Days to Update: 82

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

SHASTA COUNTY:

DRAFT

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 12/03/2020
Date Data Arrived at EDR: 12/03/2020
Date Made Active in Reports: 02/18/2021
Number of Days to Update: 77

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 05/24/2021
Next Scheduled EDR Contact: 09/12/2021
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 12/15/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 12/23/2020
Number of Days to Update: 7

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 03/19/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 01/05/2021
Date Data Arrived at EDR: 01/06/2021
Date Made Active in Reports: 03/18/2021
Number of Days to Update: 71

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 03/19/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 02/09/2021
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 05/05/2021
Number of Days to Update: 83

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 04/21/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Varies

SUTTER COUNTY:

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UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 03/02/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 78

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 01/13/2021
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 04/06/2021
Number of Days to Update: 82

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 01/19/2021
Date Data Arrived at EDR: 01/20/2021
Date Made Active in Reports: 04/08/2021
Number of Days to Update: 78

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 02/02/2021
Date Data Arrived at EDR: 02/04/2021
Date Made Active in Reports: 04/23/2021
Number of Days to Update: 78

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

VENTURA COUNTY:

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BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 12/28/2020
Date Data Arrived at EDR: 01/29/2021
Date Made Active in Reports: 04/22/2021
Number of Days to Update: 83
Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 04/19/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/25/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: No Update Planned

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/05/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: No Update Planned

MED WASTE VENTURA: Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 03/29/2021
Date Data Arrived at EDR: 04/21/2021
Date Made Active in Reports: 04/23/2021
Number of Days to Update: 2
Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 04/19/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/09/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 12/21/2020
Date Data Arrived at EDR: 12/23/2020
Date Made Active in Reports: 01/04/2021
Number of Days to Update: 12
Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 03/26/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Annually

YUBA COUNTY:

DRAFT

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 04/21/2021
Date Data Arrived at EDR: 04/22/2021
Date Made Active in Reports: 05/12/2021
Number of Days to Update: 20

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 04/24/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 10/05/2020
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 05/10/2021
Number of Days to Update: 82

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/11/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 04/29/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 72

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 04/30/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 02/24/2021
Number of Days to Update: 13

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/13/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Annually

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WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/08/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

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GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

CAMINO DEL MAR BRIDGE PROJECT
DEL MAR
SOLANA BEACH, CA 92075

TARGET PROPERTY COORDINATES

Latitude (North):	32.975423 - 32° 58' 31.52''
Longitude (West):	117.269037 - 117° 16' 8.53''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	474860.1
UTM Y (Meters):	3648403.5
Elevation:	12 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5622846 DEL MAR OE W, CA
Version Date:	2012
Southeast Map:	5622814 DEL MAR, CA
Version Date:	2012

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EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

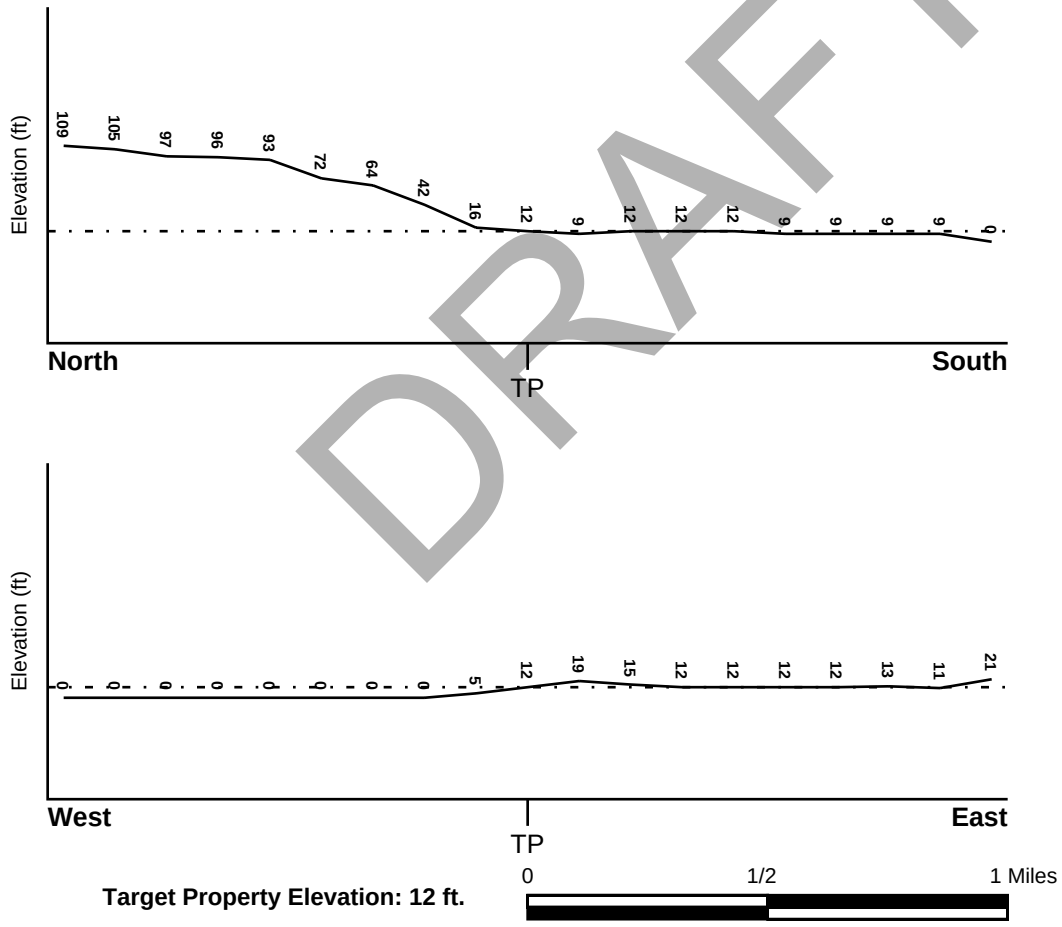
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SSW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 12 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06073C1307G	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06073C1309G	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
WEST DEL MAR (OE)	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
1	1/4 - 1/2 Mile ESE	WNW
A7	1/2 - 1 Mile ENE	SW
1G	1/2 - 1 Mile ENE	SW
2G	1/4 - 1/2 Mile ESE	WNW

For additional site information, refer to Physical Setting Source Map Findings.

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* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Cenozoic
System:	Tertiary
Series:	Eocene
Code:	Te *(decoded above as Era, System & Series)*

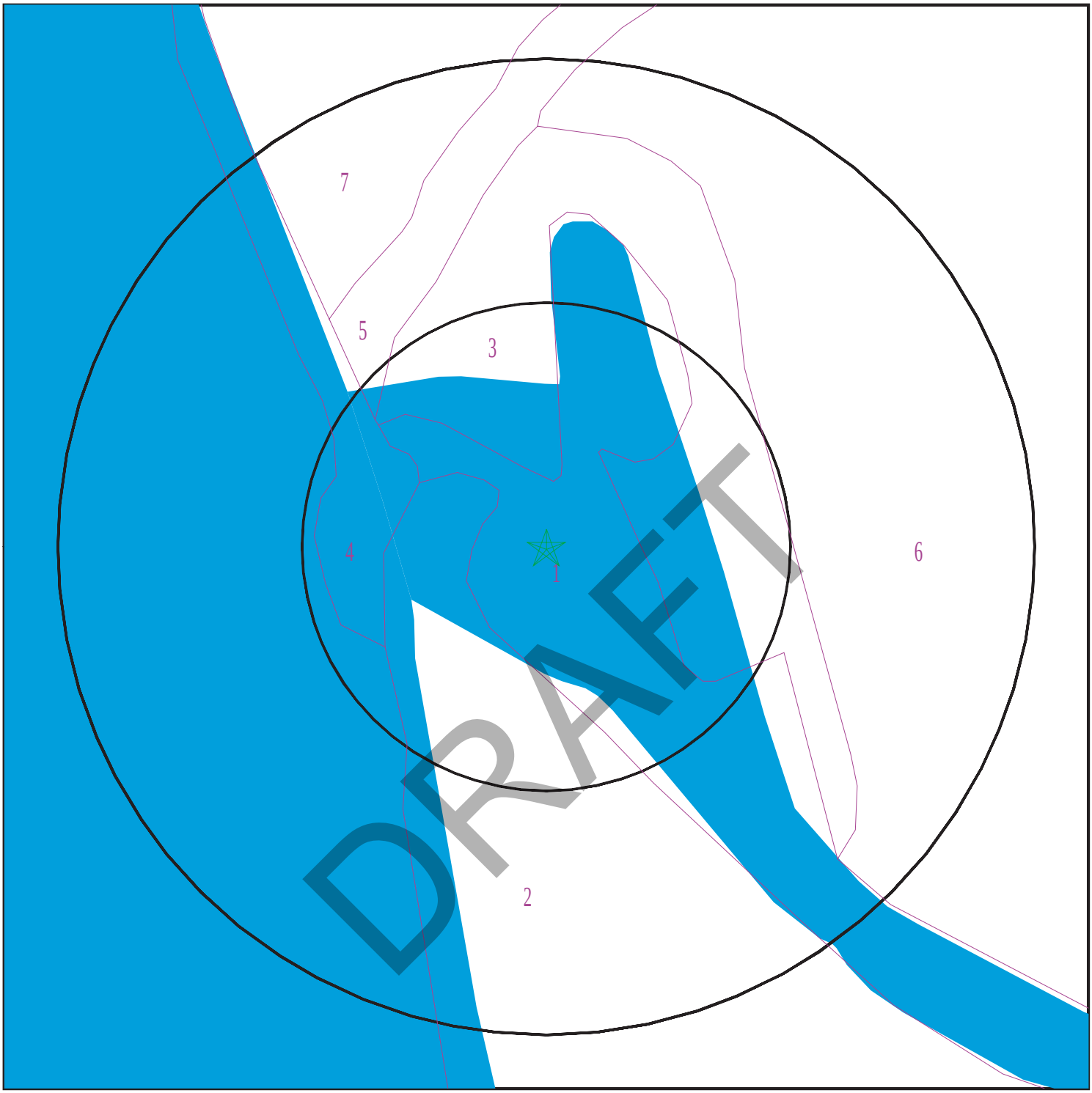
GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

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SSURGO SOIL MAP - 06515458.2r



Target Property
SSURGO Soil
Water

SITE NAME:	Camino Del Mar Bridge Project	CLIENT:	Kleinfelder, Inc.
ADDRESS:	Del Mar Solana Beach CA 92075	CONTACT:	Stefan Birardi
		INQUIRY #:	06515458.2r
LAT/LONG:	32.975423 / 117.269037	DATE:	June 01, 2021 10:26 am

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name:	LAKES AND LAGOONS
Soil Surface Texture:	
Hydrologic Group:	Not reported
Soil Drainage Class:	
Hydric Status: Not hydric	
Corrosion Potential - Uncoated Steel:	Not Reported
Depth to Bedrock Min:	> 0 inches
Depth to Watertable Min:	> 0 inches

No Layer Information available.

Soil Map ID: 2

Soil Component Name:	TUJUNGA
Soil Surface Texture:	sand
Hydrologic Group:	Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.
Soil Drainage Class:	Somewhat excessively drained
Hydric Status: Partially hydric	
Corrosion Potential - Uncoated Steel:	Moderate
Depth to Bedrock Min:	> 0 inches
Depth to Watertable Min:	> 0 inches

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.8 Min: 6.6
2	14 inches	33 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.8 Min: 6.6
3	33 inches	59 inches	stratified gravelly sand to gravelly loamy sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.8 Min: 6.6

DRAFT

Soil Map ID: 3

Soil Component Name: TIDAL FLATS

Soil Surface Texture: variable

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Very poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	59 inches	variable	Not reported	Not reported	Max: Min:	Max: Min:

Soil Map ID: 4

Soil Component Name: COASTAL BEACHES

Soil Surface Texture: coarse sand

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 92 inches

DRAFT

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	coarse sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 141 Min: 42	Max: 7.8 Min: 5.1
2	5 inches	59 inches	coarse sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 141 Min: 42	Max: 7.8 Min: 5.1

Soil Map ID: 5

Soil Component Name: TERRACE ESCARPMENTS

Soil Surface Texture: variable

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class:
Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	59 inches	variable	Not reported	Not reported	Max: Min:	Max: Min:

Soil Map ID: 6

Soil Component Name: MADE LAND

Soil Surface Texture: variable

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class:
Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

DRAFT

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	variable	Not reported	Not reported	Max: Min:	Max: Min:

Soil Map ID: 7

Soil Component Name: MARINA

Soil Surface Texture: loamy coarse sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

DRAFT

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	loamy coarse sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 8.4 Min: 7.4
2	9 inches	57 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 8.4 Min: 7.4

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	57 inches	59 inches	sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 8.4 Min: 7.4

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LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A2	CAEDF0000011582	1/2 - 1 Mile ENE
A3	CAEDF0000112836	1/2 - 1 Mile ENE
A4	CAEDF0000072151	1/2 - 1 Mile ENE
A5	CAEDF0000088721	1/2 - 1 Mile ENE
A6	CAEDF0000086109	1/2 - 1 Mile ENE
8	CADWR0000030452	1/2 - 1 Mile SSE
A9	CAEDF0000090420	1/2 - 1 Mile ENE
A10	CAEDF0000130850	1/2 - 1 Mile ENE
A11	CAEDF0000005907	1/2 - 1 Mile ENE
A12	CAEDF0000010540	1/2 - 1 Mile ENE
A13	CAEDF0000000897	1/2 - 1 Mile ENE
A14	CAEDF0000130133	1/2 - 1 Mile ENE
A15	CAEDF0000094439	1/2 - 1 Mile ENE
A16	CAEDF0000002623	1/2 - 1 Mile ENE
A17	CAEDF0000141236	1/2 - 1 Mile ENE
A18	CAEDF0000034445	1/2 - 1 Mile ENE
A19	CAEDF0000033826	1/2 - 1 Mile ENE
A20	CAEDF0000070146	1/2 - 1 Mile ENE
B21	CAEDF0000064869	1/2 - 1 Mile ENE
B22	CAEDF0000089765	1/2 - 1 Mile ENE
B23	CAEDF0000020984	1/2 - 1 Mile ENE
B24	CAEDF0000095881	1/2 - 1 Mile ENE
B25	CAEDF0000001226	1/2 - 1 Mile ENE
B26	CAEDF0000082211	1/2 - 1 Mile ENE
C27	CAEDF0000126338	1/2 - 1 Mile ENE
C28	CAEDF0000115798	1/2 - 1 Mile ENE
D29	CADWR0000004098	1/2 - 1 Mile East
D30	CADWR0000021895	1/2 - 1 Mile East

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PHYSICAL SETTING SOURCE MAP - 06515458.2r



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- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	Camino Del Mar Bridge Project	CLIENT:	Kleinfelder, Inc.
ADDRESS:	Del Mar Solana Beach CA 92075	CONTACT:	Stefan Birardi
LAT/LONG:	32.975423 / 117.269037	INQUIRY #:	06515458.2r
		DATE:	June 01, 2021 10:26 am

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

			Database	EDR ID Number
1 **ESE** **1/4 - 1/2 Mile** **Lower**	Site ID:	Not Reported	**AQUIFLOW**	**38677**
	Groundwater Flow:	WNW		
	Shallow Water Depth:	Not Reported		
	Deep Water Depth:	Not Reported		
	Average Water Depth:	11		
	Date:	10/15/1991		

A2
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000011582**

Well ID:	T0607301584-MW-25	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-25
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-25&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-25		

A3
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000112836**

Well ID:	T0607301584-MW-23	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-23
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-23&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-23		

A4
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000072151**

Well ID:	T0607301584-MW-24	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-24
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-24&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-24		

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

A5
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000088721**

Well ID:	T0607301584-MW-16	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-16
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-16&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-16		

A6
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000086109**

Well ID:	T0607301584-MW-18	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-18
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-18&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-18		

A7
ENE
1/2 - 1 Mile
Higher

Site ID:	Not Reported
Groundwater Flow:	SW
Shallow Water Depth:	Not Reported
Deep Water Depth:	Not Reported
Average Water Depth:	9
Date:	01/16/1991

AQUIFLOW **38804**

8
SSE
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000030452**

Well ID:	14S04W11J002S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	14S04W11J002S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=14S04W11J002S&store_num=		
GeoTracker Data:	Not Reported		

A9
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000090420**

Well ID:	T0607301584-MW-22	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-22
GAMA PFAS Testing:	Not Reported		

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Groundwater Quality Data: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-22&store_num=
GeoTracker Data: https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-22

A10
ENE **CA WELLS** **CAEDF0000130850**
1/2 - 1 Mile
Higher

Well ID:	T0607301584-MW-15	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-15
GAMA PFAS Testing:	Not Reported		

Groundwater Quality Data: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-15&store_num=
GeoTracker Data: https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-15

A11
ENE **CA WELLS** **CAEDF0000005907**
1/2 - 1 Mile
Higher

Well ID:	T0607301584-MW-13	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-13
GAMA PFAS Testing:	Not Reported		

Groundwater Quality Data: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-13&store_num=
GeoTracker Data: https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-13

A12
ENE **CA WELLS** **CAEDF0000010540**
1/2 - 1 Mile
Higher

Well ID:	T0607301584-MW-19A	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-19A
GAMA PFAS Testing:	Not Reported		

Groundwater Quality Data: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-19A&store_num=
GeoTracker Data: https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-19A

A13
ENE **CA WELLS** **CAEDF0000000897**
1/2 - 1 Mile
Higher

Well ID:	T0607301584-MW-20	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-20
GAMA PFAS Testing:	Not Reported		

Groundwater Quality Data: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-20&store_num=

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GeoTracker Data: https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-20

A14
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000130133**

Well ID:	T0607301584-MW-17	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-17
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-17&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-17		

A15
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000094439**

Well ID:	T0607301584-MW-21	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-21
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-21&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-21		

A16
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000002623**

Well ID:	T0607301584-MW-6	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-6
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-6&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-6		

A17
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000141236**

Well ID:	T0607301584-MW-14	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-14
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-14&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-14		

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Map ID
Direction
Distance
Elevation | Database | EDR ID Number

A18
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000034445**

Well ID:	T0607301584-MW-19B	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-19B
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-19B&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-19B		

A19
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000033826**

Well ID:	T0607301584-MW-11	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-11
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-11&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-11		

A20
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000070146**

Well ID:	T0607301584-MW-10	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-10
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-10&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-10		

B21
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000064869**

Well ID:	T0607301584-MW-26	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-26
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301584&assigned_name=MW-26&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301584&assigned_name=MW-26		

DRAFT

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

B22
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000089765**

Well ID:	T0607301562-MW-7	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-7
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301562&assigned_name=MW-7&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301562&assigned_name=MW-7		

B23
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000020984**

Well ID:	T0607301562-MW-8	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-8
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301562&assigned_name=MW-8&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301562&assigned_name=MW-8		

B24
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000095881**

Well ID:	T0607301562-MW-6	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-6
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301562&assigned_name=MW-6&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301562&assigned_name=MW-6		

B25
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000001226**

Well ID:	T0607301562-MW-2	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-2
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301562&assigned_name=MW-2&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301562&assigned_name=MW-2		

DRAFT

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

B26
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000082211**

Well ID:	T0607301562-MW-1	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-1
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301562&assigned_name=MW-1&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301562&assigned_name=MW-1		

C27
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000126338**

Well ID:	T0607301562-MW-3	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-3
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301562&assigned_name=MW-3&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301562&assigned_name=MW-3		

C28
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000115798**

Well ID:	T0607301562-MW-5	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-5
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0607301562&assigned_name=MW-5&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0607301562&assigned_name=MW-5		

D29
East
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000004098**

Well ID:	14S04W01P002S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	14S04W01P002S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=14S04W01P002S&store_num=		
GeoTracker Data:	Not Reported		

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation				Database	EDR ID Number
D30 **East** **1/2 - 1 Mile** **Higher**				**CA WELLS**	**CADWR0000021895**
Well ID:	14S04W01P001S	Well Type:	UNK		
Source:	Department of Water Resources				
Other Name:	14S04W01P001S	GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=14S04W01P001S&store_num=				
GeoTracker Data:	Not Reported				

1G **ENE** **1/2 - 1 Mile** **Lower**	Site ID:	Not Reported	**AQUIFLOW**	**38804**
	Groundwater Flow:	SW		
	Shallow Water Depth:	Not Reported		
	Deep Water Depth:	Not Reported		
	Average Water Depth:	9		
	Date:	01/16/1991		

2G **ESE** **1/4 - 1/2 Mile** **Lower**	Site ID:	Not Reported	**AQUIFLOW**	**38677**
	Groundwater Flow:	WNW		
	Shallow Water Depth:	Not Reported		
	Deep Water Depth:	Not Reported		
	Average Water Depth:	11		
	Date:	10/15/1991		

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92075	17	2

Federal EPA Radon Zone for SAN DIEGO County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for SAN DIEGO COUNTY, CA

Number of sites tested: 30

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.677 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.400 pCi/L	100%	0%	0%
Basement	Not Reported	Not Reported	Not Reported	Not Reported

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PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

DRAFT

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

OTHER STATE DATABASE INFORMATION

Groundwater Ambient Monitoring & Assessment Program
State Water Resources Control Board
Telephone: 916-341-5577
The GAMA Program is Californias comprehensive groundwater quality monitoring program. GAMA collects data by testing the untreated, raw water in different types of wells for naturally-occurring and man-made chemicals. The GAMA data includes Domestic, Monitoring and Municipal well types from the following sources, Department of Water Resources, Department of Heath Services, EDF, Agricultural Lands, Lawrence Livermore National Laboratory, Department of Pesticide Regulation, United States Geological Survey, Groundwater Ambient Monitoring and Assessment Program and Local Groundwater Projects.

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations
Source: Dept of Conservation, Geologic Energy Management Division
Telephone: 916-323-1779
Oil and Gas well locations in the state.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

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PHYSICAL SETTING SOURCE RECORDS SEARCHED

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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APPENDIX C
AGENCY DOCUMENTATION

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DOC CalGEM WellFinder

maps.conservation.ca.gov/doggr/wellfinder/#openModal/-117.25647/32.97710/15

Well Finder
CalGEM GIS

More Info | Help | ©

Well Status and Well Type Filter
Search
Zoom to Field
Measurement
Layers

Enter place or location

Basemaps

Solana Beach
Eden Gardens
Del Mar Fairgrounds
Del Mar Golf Center
Lomas Santa Fe Country Club
North City West Openspace
Dog Beach
Via de La Valle
Turf Rd
Jimmy Durante Blvd
El Camino Real
San Dieguito River
Racetrack View Dr
Modena Pl
Torrey Hill Ln

DRAFT

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1:18,056 32.974978 -117.289661

Powered by WellSTAR

CS

County of San Diego

GARY W. ERBECK
DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
LAND AND WATER QUALITY DIVISION
P.O. BOX 129261, SAN DIEGO, CA 92112-9261
(619) 338-2222 FAX (619) 338-2377
1-800-253-9933

RICHARD HAAS
ASSISTANT DIRECTOR

October 12, 2000

Mr. Larry Baumann
Del Mar Fairgrounds
2260 Jimmy Durante Blvd.
Del Mar, CA 92014-2216

Dear Mr. Baumann:

UNDERGROUND STORAGE TANK (UST) CASE #H03436-001
DEL MAR FAIRGROUNDS
2260 JIMMY DURANTE BLVD., DEL MAR, CA 92014-2216

This letter confirms the completion of a site investigation and corrective action for the underground storage tank formerly located at the above-described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground storage tank is greatly appreciated.

Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, this agency finds that the site investigation and corrective action carried out at your underground storage tanks site is in compliance with the requirements of subdivisions (a) and (b) of Section 25299.37 of the Health and Safety Code and with corrective action regulations adopted pursuant to Section 25299.77 of the Health and Safety Code and that no further action related to the petroleum releases at the site is required.

This notice is issued pursuant to subdivision (h) of Section 25299.37 of the Health and Safety Code. Please contact Carol Spangenberg (619) 338-2257 if you have questions regarding this matter.

Sincerely,

MIKE VERNETTI, Program Manager
Supervising Environmental Health Specialist
Site Assessment and Mitigation Program

MV:CS:kf

Enclosure

cc: Regional Water Quality Control Board
Allan Patton, SWRCB, UST Cleanup Fund Program
Michael P. Sellens, Sellens Environmental
Mr. Tom Baker, California Construction Authority

DRAFT

Case Closure Summary
Leaking Underground Fuel Storage Tank Program

I. AGENCY INFORMATION

DATE: October 10, 2000

Agency Name: County of San Diego, Environmental Health, SAM	Address: P.O. Box 129261
City/State/ZIP: San Diego, CA 92112-9261	Phone: (619) 338-2222 FAX: (619) 338-2377
Responsible Staff Person: Carol Spangenberg	Title: Environmental Health Specialist

II. CASE INFORMATION

Site Facility Name: Del Mar Fairgrounds		
Site Facility Address: 2260 Jimmy Durante Drive, Del Mar, CA 92014		
RB LUSTIS Case No: N/A	Local Case No: H03436-001	LOP Case No: N/A
URF Filing Date: January 31, 1998	SWEEPS No: N/A	
Responsible Parties:	Address:	Phone Number:
22nd District Agricultural Association-State of California	Attn: Mr. Larry Baumann Del Mar Fairgrounds 2260 Jimmy Durante Blvd. Del Mar, CA 92014-2216	(858) 792-4212

Tank No.	Size in Gal.	Contents	Closed in Place/Removed	Date
1	2000	Gasoline	Removed	10/30/1997

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and Type of Release: a release of gasoline occurred from the UST system.		
Site Characterization complete? Yes	Date Approved By Oversight Agency: May 15, 2000	
Monitoring Wells Installed? Yes	Number: 4	Proper Screened Interval? Yes
Highest GW Depth Below Ground Surface: 0.72 feet	Lowest Depth: 5.85 feet	Flow Direction: southwest
Most Sensitive Current Use: groundwater is excepted from beneficial uses (beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate Highway 5) and surface water has recreational 1 and 2, biological, estuary, wildlife, rare, marine, & migratory habitat beneficial uses.		
Are Drinking Water Wells Affected? No	Aquifer Name: San Diegito Lagoon (905.11)	
Is Surface Water Affected? No	Nearest SW name: San Diegito Lagoon	
Off-Site Beneficial Use Impacts (addresses/locations): none		
Report(s) on file? Yes	Where is Report(s) Filed? County of San Diego, Environmental Health (H03436-001)	

TREATMENT AND DISPOSAL OF AFFECTED MATERIAL

Material	Amount (Include Units)	Action (Treatment or Disposal w/Destination)	Date
Tank(s)	One 2,000 gallon	Disposed after hazardous waste decontamination at Demenno Kerdoon	10/30/97
Piping	15 feet	Disposed after decontamination	10/30/97
Free Product	None	None	Not applicable
Soil	3,420 pounds	Disposed at Crosby & Overton, 1630 W. 17th Street, Long Beach, CA 90813	7/28/00
Groundwater	110 gallons	Disposed at Crosby & Overton	7/28/00
Barrels	None	NA	NA

DRAFT

Case Closure Summary
Leaking Underground Fuel Storage Tank Program

III. RELEASE AND SITE CHARACTERIZATION INFORMATION (Continued) H03436-001

MAXIMUM DOCUMENTED CONTAMINANT CONCENTRATIONS - - BEFORE AND AFTER CLEANUP

Contaminant	Soil (ppm)		Water (ppm)		Contaminant	Soil (ppm)		Water (ppm)	
	Before	After	Before	After		Before	After	Before	After
TPH (Gas)	5,400	5,400	240.273	.590	MTBE	<.05	<.05	.448	.100
TPH (Diesel)	210	210	2.000	2.000	Ethylbenzene	8.6	8.6	2.742	.063
Benzene	4.8	4.8	0.968	.0091	Oil & Grease	NA	NA	NA	NA
Toluene	1.8	1.8	7.820	.0091	Heavy Metals Total lead	<3	<3	NA	NA
Xylene	49	49	14.416	.041	Other-EPA 8260B Oxygenates	*see note below	*see note below	*see note below	*see note below

Comments: The fuel oxygenated volatile organics DIPE, ETBE, TBA and TAME were all less than detection in soil. DIPE, ETBE and TBA were also less than detection in groundwater. There was .0067 mg/l of TAME in January 2000 and .0074 mg/l at the last sampling event in May 2000.

No soil was removed during this investigation except that resulting from the soil boring and well installation activity. The eight cubic yards of soil from the UST excavation was placed back in the excavation above gravel and plastic sheeting. The consultant estimates that approximately 37 cubic yards of soil impacted with petroleum remains at the site.

The furthest down-gradient well, which is 125 feet southwest of the excavation and up-gradient of the San Dieguito Lagoon, contained .0091mg/l benzene and .089 mg/l MTBE. These concentrations constitute a decreasing trend in benzene and a stable concentration of MTBE. Since groundwater is shallow it is expected that the residual petroleum hydrocarbons will biodegrade.

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? Yes

Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan? Yes

Does corrective action protect public health for current land use? Yes
Case oversight was completed based upon the current and future site use as maintenance area.

Site Management Requirements: Any contaminated soil excavated, as part of subsurface construction work must be managed in accordance with the legal requirements at that time.

Should corrective action be reviewed if land use changes? Yes

Monitoring Wells Decommissioned: No	Number Decommissioned: none	Number Retained: four

*The August 31, 2000 report indicates that the four wells will be properly abandoned after receipt of the closure "No Further Action' letter.

List Enforcement Actions Taken: Notice of Corrective Action and Reimbursement Responsibility

List Enforcement Actions Rescinded: None

V. LOCAL AGENCY REPRESENTATIVE DATA

Name: Kevin Heaton	Title: Senior Hydrogeologist Land and Water Quality Division
Signature: [signature]	Date: 10/10/2000

VI. RWQCB NOTIFICATION

Date Submitted to RB: Not required-non-beneficial groundwater	RB Response: Not required	
RWQCB Staff Name: Not required	Title: Not required	Date:NA

VII. ADDITIONAL COMMENTS, DATA, ETC.

The near surface soil lithology at the Site is sandy silts and sands.

This document and the related CASE CLOSURE LETTER shall be retained by the lead agency as part of the official site file.

DRAFT

Agricultural Assoc - 22ND Dist TO file

H03436

To: Mr. Paul Friedman
Hazardous Materials Specialist
D.E.H.

From: Ron McEuen
Maint.& Ops. Supervisor II
22DAA

Date: 10-24-01

Paul, in response to your inspection of 9-12-01, we are going to remove any water and fuel from the spill buckets on our 2 underground storage tanks in-house. We will be using a hand operated suction gun to remove any liquid and disposing of it with our recycled waste oil.
I hope this will satisfy your requirement. If not, please call me at (858)755-1161 so that we can take other steps to correct this problem.

Thank you for your support,
Ron

DRAFT

Sellens Environmental
5031 Lourina Court
Fair Oaks, California 95628-3419

RECEIVED
MAR 5 8 32 AM '01
ENVIRONMENTAL
HEALTH SERVICES

Sellens Environmental

Telephone (916) 966-8502
Fax (916) 966-6503

February 28, 2001

Ms. Carol Spangenberg
County of San Diego
Site Assessment and Mitigation Division
Department of Environmental Health
P.O. Box 129261
San Diego, California 92112-9261

Reference: Well Abandonment at the Site of the former Underground Storage Tank at the Del Mar Fairgrounds in Del Mar, California. (Case #H03436-001)

FILE IN CLOSED FILE

Dear Ms. Spangenberg:

The purpose of this letter is to inform you that the four groundwater monitoring wells at the site of the former underground storage tank (UST) in the maintenance yard of the Del Mar Fairgrounds were destroyed on Friday February 9, 2001. The location of the abandoned wells is shown in Figure 1. Each well was over drilled using hollow-stem augers and the resulting borehole backfilled with a bentonite grout "hole-plug". The drilling and abandonment was preformed by Tri-County Drilling under Permit #W99522, issued by your agency on January 9 2001. A copy of the permit is attached. The materials removed from the well bore was transported off site and disposed of as a non-hazardous waste.

How that the wells have been abandon, it is assumed that the project has been completed, and your agency will consider the Case Closed, and issue the appropriate documentation to the Fairgrounds. In the meantime, if you have any questions or require additional information regarding this report or the project in general, please do not hesitate to contact me at (916) 966-8502.

Explained that no letter is needed - Verbal Agr't a NFA last year

Sincerely

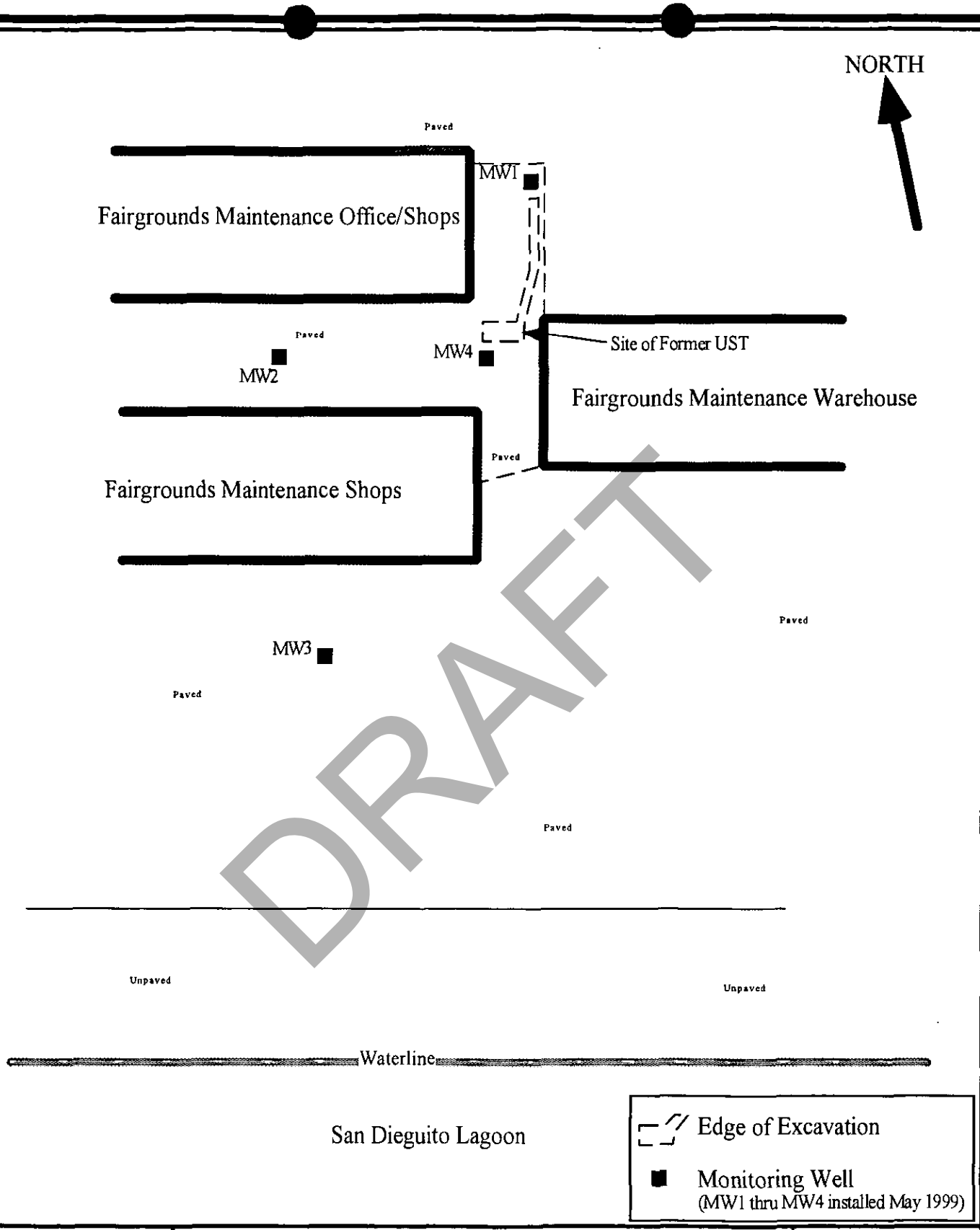
Michael P. Sellens

REGISTERED GEOLOGIST Michael P. Sellens No. 4714 STATE OF CALIFORNIA

Michael P. Sellens, RG 4714

cc: Mr. Tom Baker, CCA
Mr. Larry Baumann, 22nd DAA/Del Mar Fairgrounds
Mr. Ron McEuen, 22nd DAA/Del Mar Fairgrounds

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Scale 1 inch = 40 feet	Site of Former Underground Storage Tank and Monitoring Well Locations Del Mar Fairgrounds Del Mar, California	Figure 1 ***Sellens Environmental***

PERMIT # W99522
A.P.N. 760-145-05
EST # H03436

COUNTY OF SAN DIEGO
DEPARTMENT OF ENVIRONMENTAL HEALTH
LAND AND WATER QUALITY DIVISION

MONITORING WELL AND BORING CONSTRUCTION AND DESTRUCTION PERMIT

SITE NAME: 22ND DISTRICT AGRICULTURAL ASSOCIATION

SITE ADDRESS: 2260 JIMMY DURANTE BLVD, DEL MAR, CA 92014

PERMIT TO: **DESTROY 4 GROUNDWATER MONITORING WELLS**

PERMIT APPROVAL DATE: JANUARY 9, 2001

PERMIT EXPIRES ON: MAY 9, 2001

PERMIT CONDITIONS:

1. **All material within the original borehole, which includes the casing, filterpack and annular seal must be removed. The borehole must be completely filled with an approved sealing material as specified in Department of Water Resources Bulletin 74-90.**

2. All wash water must be contained and disposed of properly.

3. Provide documentation of well destruction. This should include:

   a) A description of the method of destruction,
   b) A description of the type of sealing materials and quantity used and
   c) The date the work was started and the date the work was completed.

4. All water and soil placed in drums must be labeled and stored as specified in the 2000 SAM Manual in:

   Section 5, Page 7 (5)

5. This office must be given 48-hour notice of any drilling activity on this site. Please contact Marisue Crystal at (619)338-2339.

6. This office must be given advanced notification of drilling cancellation. Please contact Marisue Crystal at (619)338-2339.

NOTE: **This permit does not constitute approval of a workplan as defined in Section 2722 of Article 11 of C.C.R., Title 23. Workplans are required for all unauthorized release investigations in San Diego County.**

APPROVED BY: Robert Rapista DATE: 1/9/01

Notified: V.M. MSC

DRAFT

PERMIT APPLICATION GROUNDWATER AND VADOSE MONITORING WELLS AND EXPLORATORY OR TEST BORINGS

RECEIVED
DEC 26 12 38 PM '00

OFFICE USE ONLY	
PERMIT#:	W
SAM CASE Y/N	H
DATE RECEIVED:	
FEE PAID:	

A. RESPONSIBLE PARTY 22ND DISTRICT AGRICULTURE ASSOCIATION Phone 858/792-4212
Mailing Address DEL MAR FAIRGROUNDS, 2260 JIMMY DURANTE DR, DEL MAR CA 92014

B. SITE ASSESSMENT PROJECT IF APPLICABLE #H 03436-001

C. CONSULTING FIRM SELLENS ENVIRONMENTAL Contact Person MICHAEL SELLENS
Registered Professional (RG, RCE, CEG) R.G. Registration # 4714 Phone 916/966-8502
Mailing Address 5031 LOURINA COURT City FAIR OAKS State CA Zip 95628

D. DRILLING COMPANY TRI-COUNTY DRILLING INC CSF# 547737 Phone 858/271-0099
Mailing Address 6415-A MARINDUSTRY DR City SAN DIEGO State CA Zip 92121-2536

E. CONSTRUCTION INFORMATION

TYPE OF WELLS/ BORINGS TO BE CONSTRUCTED

	#
☐ Groundwater	
☐ Vadose	
☐ Boring	
☐ Other	

NUMBER OF WELLS TO BE DESTROYED # 4

MATERIALS TO BE USED

CASING
Type
Gauge
Diameter
Well Screen Size
Filter Pack (Specify)

SEAL
☐ Neat Cement
☐ Cement & Bentonite
☐ Sand-Cement
☐ Bentonite
☐ Other

DRILLING METHOD
☐ Auger ☐ Air Rotor
☐ Mud Rotary
☐ Percussion ☐ Other

PROPOSED CONSTRUCTION

Estimated ground water depth _____ ft.

CEMENT SEAL _____ to _____
BENTONITE SEAL _____ to _____
FILTER PACK _____ to _____
PERFORATION _____ to _____

PROPOSED DRILLING DATE JAN 2001

NOTE:

For wells with multiple completion attach a well construction diagram

I agree to comply with the requirements of the current Site Assessment and Mitigation Division Manual, and with all ordinances and laws of the County of San Diego and the State of California pertaining to well/boring construction and destruction.

DRILLERS SIGNATURE — DATE 12/12/00

Within 30 days of completion, I will furnish the Site Assessment and Mitigation Division with a complete and accurate well/boring log. I will certify the design and construction/or destruction of the well/borings in accordance with the permit application.

Michael P. Sellens R.G. 4714 — RG/CEG/RCE SIGNATURE — DATE 12/12/00

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F. SITE INFORMATION

760-145-05

1. ASSESSORS PARCEL NUMBER ~~NOT APPLICABLE~~
Site Name DEL MAR FAIRGROUNDS
Site Address 2260 JIMMY DURANTE BLVD City DEL MAR Zip CA 92014-2216

PROPERTY OWNER 22ND DISTRICT AGRICULTURAL ASSOC Phone 858/755-1161
Mailing Address 2260 JIMMY DURANTE BLVD City DEL MAR State CA Zip 92014-2216

NUMBER OF WELLS 4 TYPE OF WELLS GROUNDWATER MONITOR

2. ASSESSORS PARCEL NUMBER ~~Abbr~~
Site Name
Site Address City Zip

PROPERTY OWNER Phone
Mailing Address City State Zip

NUMBER OF WELLS TYPE OF WELLS

3. ASSESSORS PARCEL NUMBER
Site Name
Site Address City Zip

PROPERTY OWNER Phone
Mailing Address City State Zip

NUMBER OF WELLS TYPE OF WELLS

4. ASSESSORS PARCEL NUMBER
Site Name
Site Address City Zip

PROPERTY OWNER Phone
Mailing Address City State Zip

NUMBER OF WELLS TYPE OF WELLS

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G. FEES:

FEE CODE		BASE FEE INCLUDES FIRST BORING/WELL	FEE FOR ADDITIONAL
1	Groundwater MW's Vapor Extraction MW's Vadose Wells	$150.00	_____ x $150 = _____
2	Boring/Hydropunch Geoprobes, etc.	$150.00	_____ x $90 = _____
3	Destruction	$150.00	3 x $140 = 420.00

H. APPLICATION SUBMITTAL, PLAN APPROVAL, PERMIT ISSUANCE, AND REQUIRED INSPECTIONS

Submit one (1) original and two (2) copies of this application package, including plan drawings with the required fee to the Department of Environmental Health, Site Assessment and Mitigation Division (SAM), 1255 Imperial Avenue, San Diego, CA 92101. Or mail to P. O. Box 85261, San Diego, CA 92186-5261. **Checks should be made payable to the County of San Diego.**

A permit will be issued by SAM upon review and approval of the application and plans. The required fees must be submitted with the application package. Information in addition to that presented in the application package may be needed in order to obtain final approval. No work is to begin on the proposed project until a permit has been issued. The required inspections cannot be scheduled until a permit is issued.

Once the permit has been issued, it is the responsibility of the permittee to notify SAM at least two (2) working days in advance to schedule each required inspection.

USE ONE APPLICATION PACKAGE FOR A SINGLE SITE PROJECT. A SINGLE PERMIT WILL BE ISSUED FOR A SINGLE SITE PROJECT, EVEN IF WELLS/BORINGS ARE COMPLETED ON MORE THAN ONE PROPERTY. FOR MULTIPLE SITE PROJECT'S, USE SEPARATE APPLICATIONS.

DRAFT

PERMIT APPLICATION FOR
GROUND WATER AND VADOSE MONITORING WELLS
EXPLORATORY OR TEST BORINGS

DEC 20 12 38 PM '00

- For well destruction, complete only #1 below.
- Well design, logging and construction must be supervised by a Geologist, Engineering Geologist or C... Engineer who is registered or certified by the State of California.
- Provide verification of a Well Drilling C-57 License.
- Provide a plot plan giving location of property lines, existing improvements such as structures, underground tanks, underground utilities, underground piping, and the proposed monitoring and/or observation wells.
- Provide a signed copy of the Property Owner Responsibility form for each property listed in Section F

1. If wells are to be destroyed, provide a description of method of destruction. WELLS WILL BE OVERDRILLED, AND BACKFILLED WITH GROUT

2. What is the proposed purpose of the well/boring?

3. What procedures will be used to prevent the well/boring from providing an avenue to contamination during construction?

4. What field procedures will be utilized to determine if contamination exists?

5. What procedures will be used to determine whether samples will be sent for laboratory testing or archiving?

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6. What constituents will be monitored and tested (Include EPA Laboratory Test Methods to be used)

7. How will samples be transported and preserved? _____

8. What sampling methods will be used? _____

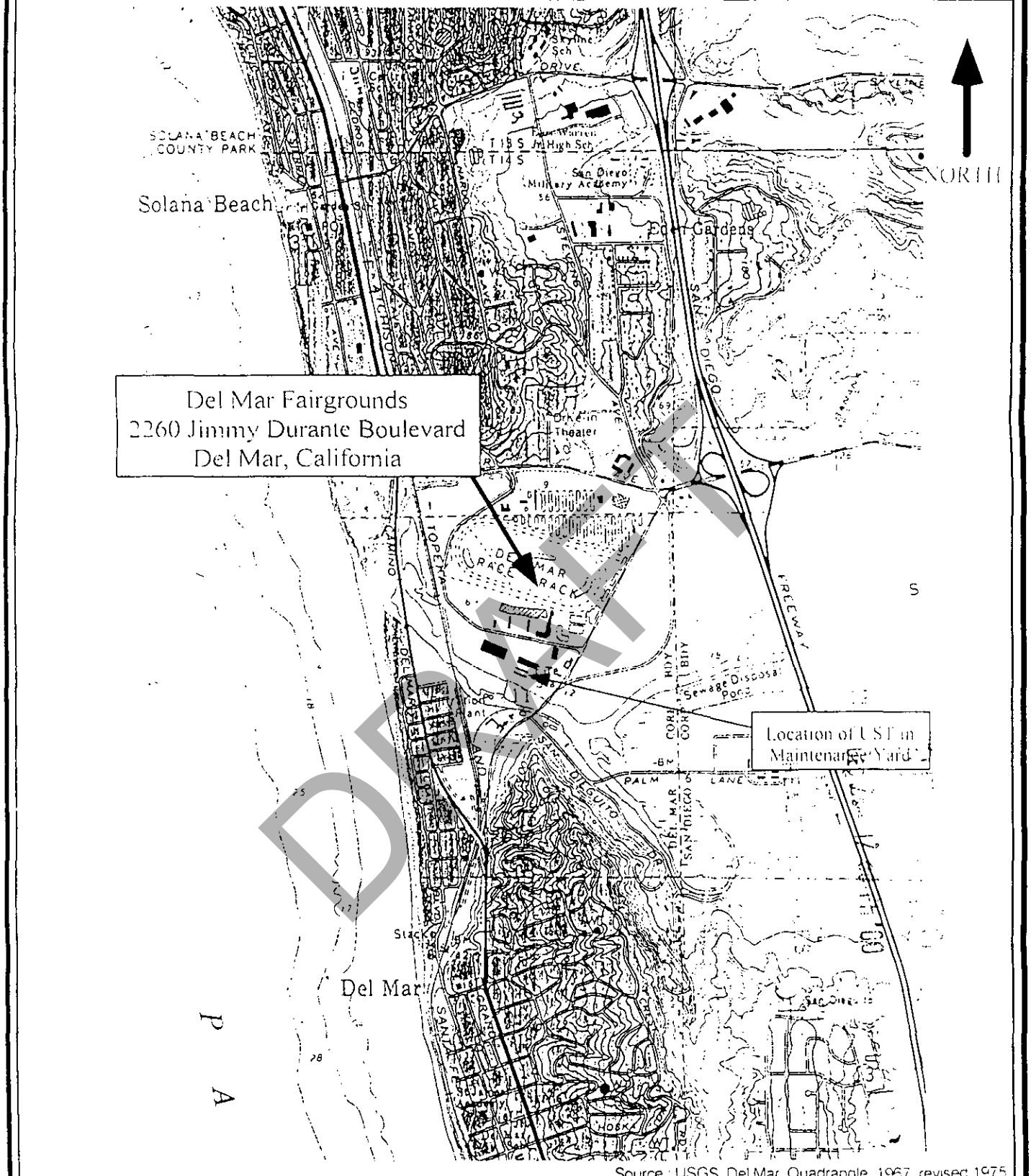
9. Are you proposing a variation from the methods and/or procedures presented in the requirements for the construction of Vadose and Ground Water Monitoring Wells (Current SAM Manual Requirements). If yes, specify these variations.

10. What procedures will be used to ensure no contamination will be introduced by the drilling equipment?

11. What methods will be used to clean sampling equipment? _____

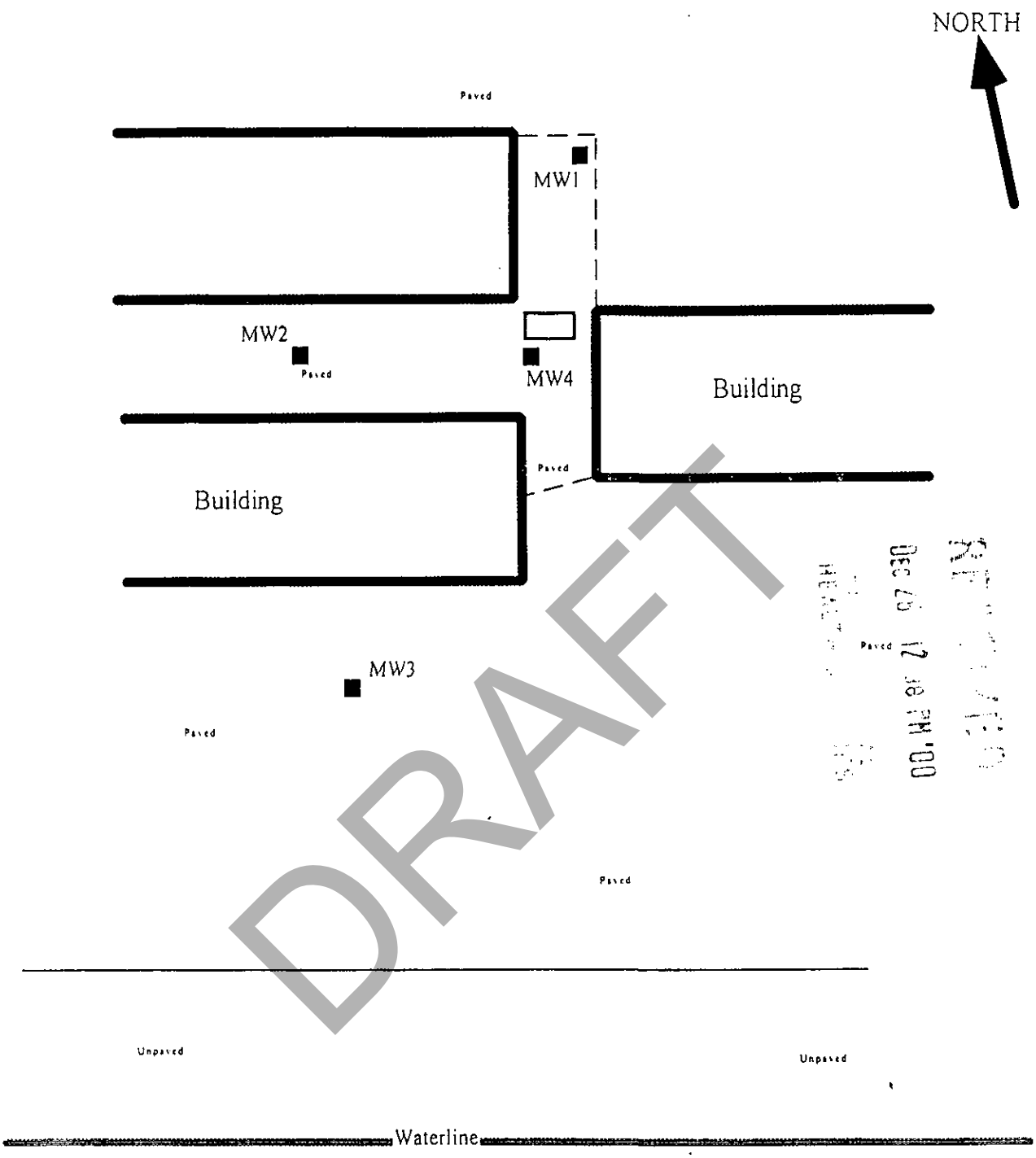
12. What cleaning method will be used to clean casing and screen prior to installation? _____

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Source : USGS, Del Mar Quadrangle, 1967 revised 1975

Scale 1inch = 2000 feet	Site Location	Figure 1
	Del Mar Fairgrounds Del Mar, California	*Sellens Environmental*



DRAFT

Scale 1 inch = 40 feet	Location of Monitoring Wells Del Mar Fairgrounds Del Mar, California	Figure 2 *Sellens Environmental*

H03436

Sellens Environmental

Sellens Environmental
5031 Lourina Court
Fair Oaks, California 95628-3419

Telephone (916) 966-8502
Fax (916) 966-6503

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FEB 5 4 08 AM '01
HEALTH SERVICES

February 1, 2001

Ms. Carol Spangenberg
County of San Diego
Site Assessment and Mitigation Division
Department of Environmental Health
P.O. Box 129261
San Diego, California 92112-9261

FILE

Reference : Well abandonment at the Site of the former Underground Storage Tank at the Del Mar Fairgrounds in Del Mar, California (Case #H03436-001)

Dear Ms. Spangenberg:

The purpose of this letter is to inform you that the four groundwater monitoring wells at the site of the former underground storage tank (UST) in the maintenance yard area of the Del Mar Fairgrounds are scheduled to be destroyed on Friday February 9, 2001. All wells will be overdrilled and the resulting borehole backfilled with a cement grout. Work will be conducted under Permit #W99522 issued by your agency on January 9 2001,. Once the wells have been abandon, your office will be informed and it is expected that formal site closure will be processed.

We will keep you informed of any changes in the scheduled actives. In the meantime, if you have any questions or require additional information regarding this report or the project in general, please do not hesitate to contact me at (916) 966-8502.

Sincerely

Michael P. Sellens

Michael P. Sellens, RG 4714

cc: Mr. Tom Baker, CCA
Mr. Larry Baumann, Del Mar Fairgrounds
Ms. Marisue Crystal, County of San Diego, DEH

DRAFT

County of San Diego

GARY W. ERBECK
DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
LAND AND WATER QUALITY DIVISION
P.O. BOX 129261, SAN DIEGO, CA 92112-9261
(619) 338-2222 FAX (619) 338-2377
1-800-253-9933

RICHARD HAAS
ASSISTANT DIRECTOR

September 26, 2000

Mr. Craig Fravel
Del Mar Thoroughbred Club
P.O. Box 700
Del Mar, CA 92014

Dear Mr. Fravel:

UNDERGROUND STORAGE TANK (UST) CASE #H04644-001 & H04644-003
DEL MAR THOROUGHBRED CLUB (DMTC)
2260 JIMMY DURANTE BLVD., DEL MAR, CA 92014

This letter confirms the completion of a site investigation and corrective action for the underground storage tanks formerly located at the above-described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground storage tanks is greatly appreciated.

Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, this agency finds that the site investigation and corrective action carried out at your underground storage tank(s) site is in compliance with the requirements of subdivisions (a) and (b) of Section 25299.37 of the Health and Safety Code and with corrective action regulations adopted pursuant to Section 25299.77 of the Health and Safety Code and that no further action related to the petroleum release(s) at the site is required.

This notice is issued pursuant to subdivision (h) of Section 25299.37 of the Health and Safety Code. Please contact Mo. Lahsaie at (619) 338-2256 if you have questions regarding this matter.

Sincerely,

MICHAEL VERNETTI, Program Manager
Supervising Environmental Health Specialist
Site Assessment and Mitigation Program

MV:ML:kf

Enclosure

cc: Regional Water Quality Control Board
Allan Patton, SWRCB, UST Cleanup Fund Program
Patricia Butler, Butler Roach Group

DRAFT

Case Closure Summary
Leaking Underground Fuel Storage Tank Program

I. AGENCY INFORMATION

DATE:09/25/2000

Agency Name: County of San Diego, Environmental Health, SAM	Address: P.O. Box 129261
City/State/ZIP: San Diego, CA 92112-9261	Phone: (619) 338-2222 FAX: (619) 338-2377
Responsible Staff Person: Mo. Lahsaie	Title: Project Manager

II. CASE INFORMATION

Site Facility Name: Del Mar Thoroughbred Club (DMTC)		
Site Facility Address: 2260 Jimmy Durante Blvd., Del Mar, CA 92014		
RB LUSTIS Case No: N/A	Local Case No: H04644-001 & H04644-003	LOP Case No: N/A
URF Filing Date: 07/09/1987	SWEEPS No: N/A	
Responsible Parties:	Address:	Phone Number:
Del Mar Thoroughbred Club, Mr. Craig Fravel	P.O. Box 700, Del Mar, CA 92014	(619) 755-1141
State of Calif., 22nd District, Agricultural Assoc.		

Tank No.	Size in Gal.	Contents	Closed in Place/Removed	Date
1	2,000	Unleaded Gasoline	Removed	07/27/87
2	700	Diesel	Removed	07/06/93
3	—	—	—	—
4	—	—	—	—

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and Type of Release: Leaky UST Systems			
Site Characterization complete? Yes	Date Approved By Oversight Agency: 12/29/98		
Monitoring Wells Installed? Yes	Number: 8	Proper Screened Interval? Yes	
Highest GW Depth Below Ground Surface: 1.93 feet below grade (BGS)	Lowest Depth: 4.75 feet BGS	Flow Direction: West-Northwest	
Most Sensitive Current Use: Beneficial uses for Municipal; Beneficial uses apply to protection of bay, estuary, ocean, and inland SW			
Are Drinking Water Wells Affected? No	Aquifer Name: San Dieguito Hydrographic Sub-Unit (906.10)		
Is Surface Water Affected? No	Nearest SW name: San Dieguito River Estuary at approx. 1,200 feet to W-SW		
Off-Site Beneficial Use Impacts (addresses/locations):			
Report(s) on file? Yes	Where is Report(s) Filed? County of San Diego, Environmental Health		

TREATMENT AND DISPOSAL OF AFFECTED MATERIAL

Material	Amount (Include Units)	Action (Treatment or Disposal w/Destination)	Date
Tank(s)	2	Diesel UST disposed at Pacific Steel Facility	07/06/93
Piping	—	—	—
Free Product	—	—	—
Soil	50 Cubic Yards	Unknown	07/06/93
Groundwater	—	—	—
Barrels	—	—	—

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Case Closure Summary
Leaking Underground Fuel Storage Tank Program

III. RELEASE AND SITE CHARACTERIZATION INFORMATION (Continued) H04644-001 & -003

MAXIMUM DOCUMENTED CONTAMINANT CONCENTRATIONS - - BEFORE AND AFTER CLEANUP

Contaminant	Soil (ppm)		Water (ppm)		Contaminant	Soil (ppm)		Water (ppm)	
	Before	After	Before	After		Before	After	Before	After
TPH (Gas)	10,000	—	18.0	16.0	MTBE	—	—	—	<0.005
TPH (Diesel)	38,000	770	—	—	Ethylbenzene	190	0.15	7.3	0.360
Benzene	42	0.29	3.6	0.380	Oil & Grease	—	—	—	—
Toluene	430	<0.025	3.7	0.290	Heavy Metals	—	—	—	—
Xylene	1,100	0.67	5.2	1.90	Other	—	—	—	—

Comments: This case was started in 1987 when a 2,000 gallons gasoline UST was removed from the subject site. The second UST containing diesel fuel was removed in 1993. Approximately 50 cubic yards of petroleum-impacted soil was removed and disposed. Approximately 150 cubic yards of petroleum-impacted soil with maximum TPH concentration of 770 mg/kg remains beneath the subsurface at the subject site.

A health risk assessment was completed by Metcalf & Eddy, Inc. to evaluate the risk of occupants of the existing structures on the property. The Responsible Party chose an engineering control method for the existing building by improving the slab attenuation factor using a vapor resistant cement floor sealant/coating material recommended by Metcalf & Eddy Consultants. This engineering control completed as of May 12, 1999. Based on their risk model calculations, Metcalf & Eddy Consultants concluded that the remaining soil and groundwater beneath the site do not pose an unacceptable carcinogenic risk or adverse health hazard to the on-site workers from potential exposure from benzene vapor migration into the existing structures. Based on available information, the dissolved plume is stable and decreasing. The residual contaminant in both soil and groundwater are no threat to human health and the environment.

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? Yes

Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan? Yes

Does corrective action protect public health for current land use? Yes

Case oversight completed based upon the current site use as fairgrounds/racetrack

Site Management Requirements:

Any contaminated soil excavated as part of subsurface construction work must be managed in accordance with the legal requirements at that time.

Should corrective action be reviewed if land use changes? Yes

Monitoring Wells Decommissioned: No	Number Decommissioned: None	Number Retained: 8

List Enforcement Actions Taken: Notice of Corrective Action and Reimbursement Responsibility

List Enforcement Actions Rescinded: N/A

V. LOCAL AGENCY REPRESENTATIVE DATA

Name: Kevin Heaton	Title: Senior Hydrogeologist Land and Water Quality Division
Signature: Kevin Heaton	Date: 9/26/2000

VI. RWQCB NOTIFICATION

Date Submitted to RB: N/A - Non-beneficial Area	RB Response: —	
RWQCB Staff Name: —	Title: —	Date: —

VII. ADDITIONAL COMMENTS, DATA, ETC.

The DMTC is planning to destroy all the eight existing groundwater monitoring wells within one quarter of the date of a no further action letter for this case.

This document and the related CASE CLOSURE LETTER, shall be retained by the lead agency as part of the official site file.

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Metcalf & Eddy
An Air & Water Technologies Company

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HEALTH SERVICES

J 020112-0003

March 28, 1997

Rev. by Mo. L
H04644-001 & -003
3-28-97

Mr. Mo Lahsaie
County of San Diego
Department of Environmental Health
Site Assessment and Mitigation Division
P.O. Box 85261
San Diego, California 92186-5261

Subject: Additional Information to Support No Further Action Decision
Reference: Unauthorized Release #H04644-001 and #H04644-003

Dear Mr. Lahsaie:

DRAFT

At your request per our January 9, 1997 conversation, Metcalf & Eddy, Inc. (M&E), on behalf of the Del Mar Thoroughbred Club (DMTC), presents herein additional information to support a no further action (NFA) determination for the reference site. Based on our conversation, we understand that the County of San Diego requires supplemental site assessment information in accordance with the corrective action process outlined in the 1997 Department of Environmental Health, Site Assessment & Mitigation (SA/M) manual prior granting a NFA determination.

According to the 1997 SA/M manual, all unauthorized releases require some form of corrective action. The corrective action process, as presented in Section 2 of the manual, can be summarized as including some or all of the following steps:

1. Identification of an Unauthorized Release
2. Site Assessment
3. Determine Necessity of Further Action
4. Development and Implementation of a Corrective Action Plan
5. Verification Monitoring
6. No Further Action

The DMTC has followed the corrective action process outlined in the SA/M manual as directed by the County of San Diego. Presented below is a summary of work accomplished to date which corresponds to the identification of the unauthorized release (Step 1) and site assessment activities (Step 2). We believe that all parties are currently involved in Step 3, determining the necessity of further action. In support of this goal, this letter also presents a risk characterization for the site in accordance with the requirements of the 1997 SA/M manual.

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RELEASE IDENTIFICATION AND REMEDIATION - STEP 1

The reference site contains an area of impact which is associated with unauthorized releases from two former underground storage tanks (USTs). The former locations of both tanks are indicated on Figure 1. The first release was discovered on July 27, 1987 during the removal of a 2,000-gallon gasoline UST. The second release was discovered during July 6, 1993 during the removal of a 550-gallon diesel UST which was located adjacent to the former gasoline UST location. Remediation activities were conducted in conjunction with this tank removal.

Based on a semi-annual monitoring report submitted to SA/M on May 6, 1994, approximately 50 cubic yards of soil were removed from the former gasoline and diesel-fuel UST excavations in conjunction with the removal of the 550-gallon diesel tank in July 1993. The soil was excavated from an approximate 15-foot by 15-foot area to a depth of 5.5 feet below ground surface (bgs). According to record information, no soil was removed during the 1987 gasoline UST removal. However, soil from this area, which is located adjacent to the former gasoline tank location, was excavated and removed during July 1993. Soil stockpile samples indicate total petroleum hydrocarbons (TPH) in the diesel range (C15-C24) with concentrations ranging from 110 to 4,900 milligrams per kilogram (mg/kg).

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SITE ASSESSMENT - STEP 2

Site assessment activities have been conducted at the site since 1991 to evaluate the nature and extent of contaminant impacts. Site assessment activities have included the installation of eight groundwater wells, soil and groundwater sampling, and hydrogeologic investigations. These activities have been documented in various investigation reports submitted to the Department of Environmental Health between 1991 and 1995. As discussed in our November 7, 1996 letter to SA/M, current site data indicates the following circumstances which support a NFA determination:

- No evidence of contaminant migration and a low hydraulic gradient at the site.
- Apparent natural degradation of contaminants.
- Limited benzene impacts.
- Lack of viable pathways for exposure to sensitive receptors.

These circumstances are further discussed below.

DETERMINE NEED FOR FURTHER ACTION - STEP 3

According to risk assessment guidelines presented in Section 4.V. of the 1997 SA/M manual, "some level of contamination can remain on-site, provided that there are minimal risks of adverse effects to public health and the environment." This approach can justifiably be applied to impacts at the reference site by evaluating the following elements:

- An estimate of the location, volume and concentration of benzene impacts to groundwater at the site.
- An assessment of exposure pathways and potential human health impacts.
- Current and future use of the adjacent maintenance building.

Benzene Impacts

The most recent groundwater data for the site, collected on February 1, 1995, indicates that benzene, the only contaminant of concern, is present in only one of eight wells at the site. During this sampling event, benzene was present at Well MW-1 at a concentration of 0.38 milligrams per liter (mg/l). Based on the detection limit for benzene in the range of 1 microgram per liter (μg/l) at nearby groundwater monitoring wells, and linear decrease in concentration with distance from Well MW-1 to the surrounding monitoring wells, M&E has estimated the mass of benzene in the impacted shallow groundwater.

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The action level for groundwater concentrations of benzene is 21 μg/l (the Regional Water Quality Control Board limit for bays and estuaries). M&E developed the 21 μg/l area of impact by linear interpolation between the benzene concentration at Well MW-1 and each of the nearby monitoring wells. The approximate boundary of impacted groundwater is shown in Figure 1. The maximum horizontal extent of impact associated with this delineation covers approximately 5,730 square feet (0.13 acre).

The maximum vertical extent of soil impact at Well MW-1 is 7 feet bgs based on soil boring samples taken during well installation. The minimum depth of groundwater impact is conservatively taken to be equal to the highest recorded groundwater depth at Well MW-1 (1.74 feet - February 21, 1995). Assuming that the vertical extent of groundwater impacts is consistent with the maximum depth of soil impacts identified in soil boring samples from Well MW-1 and the highest recorded groundwater depth, the estimated vertical extent of impact at Well MW-1 is from 1.74 to 7 feet bgs. Therefore, the vertical extent of impact is estimated to be 5.26 feet.

Assuming uniform vertical distribution within the area of impact and a soil porosity of 0.5 (typically of silty sands found at the site), the estimated volume of benzene-impacted groundwater is 113,000 gallons as of February 1, 1995. Assuming an average benzene concentration of

180μg/l ([380μg/l - 21μg/l] x 0.5) within the impact area, the total estimated mass of benzene is 77 grams or 0.17 pounds.

Exposure Pathways and Human Health Impacts

In accordance with risk assessment guidance presented in the 1997 SA/M manual, M&E performed an exposure assessment evaluating the migration potential of contaminants at the site along potential pathways to sensitive receptors. This assessment has been performed following the recommended practice for inclusion/exclusion analysis presented in "Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities" prepared by the California Department of Toxic Substances Control, July 1992.

The purpose of the assessment is to perform a screening evaluation of exposure potential via three primary pathways: inhalation, ingestion and dermal contact. The exposure potential for the benzene-impacted area for these pathways via air, soil and water media are summarized in Table 1.

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Table 1
Matrix of Exposure Potential via Primary Pathways and Media

Exposure Routes	Exposure Potential by Media		
	Air	Soil	Water
Inhalation	Low potential for exposure via gases and particles due to low concentrations and asphalt and concrete paving throughout site.	Low potential for exposure via soil gases and particles due to low concentrations and asphalt and concrete paving throughout site.	Low potential for exposure via contaminants transferred from tap water due to lack of migration and non-beneficial use aquifer.
Ingestion	Low potential for exposure via transfer of gases to fruits, vegetables, grains, animals and subsequent human ingestion thereof due to low concentrations and asphalt and concrete paving throughout site.	Low potential for exposure via direct ingestion of soil or ingestion of fruits, vegetables, meat, dairy products contaminated by transferred soil or soil ingestion by animals due to asphalt and concrete paving and no agricultural or ranching activities.	Low potential for exposure via contaminants transferred from tap water, ground water due to non-beneficial use aquifer and lack of migration to surface waters. No agricultural or recreational uses.
Dermal Contact	Not considered by guidance document	Low potential for exposure due to low concentrations and asphalt and concrete paving throughout site.	Low potential for exposure via contaminants transferred from tap water or ground water due to non-beneficial use aquifer and lack of migration to surface waters. No recreational uses.

Due to the relatively low concentration and limited extent of benzene and the lack of viable exposure pathways as presented in Table 1, it is unlikely that left in place, human health would be impacted by the subject unauthorized release. Groundwater at the site is located in an area which has been designated by the Regional Water Quality Control Board as having no beneficial use. Therefore, contaminants from the site are unlikely to pose a threat to drinking water supplies. Low levels of benzene are present in groundwater in an isolated location near Well MW-1. Well MW-1 is located near the southwest corner of the DMTC facilities maintenance building. The entire facility is paved with asphalt or concrete paving. Based on on-site monitoring well data, there appears to be no migration of benzene-impacted groundwater. Historically, there has been no evidence of free product in any groundwater wells at this site. Further, it is highly unlikely that free product would develop at the site in the future as a result of existing conditions.

Utility conduits at the site consists of storm drain laterals located south and west of the former UST location. Sand or gravel backfill may in some circumstances provide a preferential pathway for contaminant migration. As shown on Figure 1, these laterals are located outside of the area of impact and therefore would not serve as migration conduits to other exposure pathways.

Maintenance Building Use

The facility is currently used for the general maintenance of activities, equipment and facilities which support thoroughbred horse racing, including service and maintenance of earth moving, grooming and landscaping equipment. Future use of this facility is anticipated to be consistent with its current use.

As previously discussed, benzene concentrations in the area of impact near the building appear to be limited in extent and concentration. Surface conditions both inside the building and in surrounding areas consist of concrete and asphalt paving, which provide an effective barrier between the facility and impacted subsurface areas. Human health impacts related to benzene-impacted area are unlikely based on the exposure assessment conducted for this site.

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CONCLUSION

We hope that the above discussion addresses your concerns and provides sufficient information to grant a no further action determination for this site. We look forward to your response. Please feel free to contact me if you have any questions.

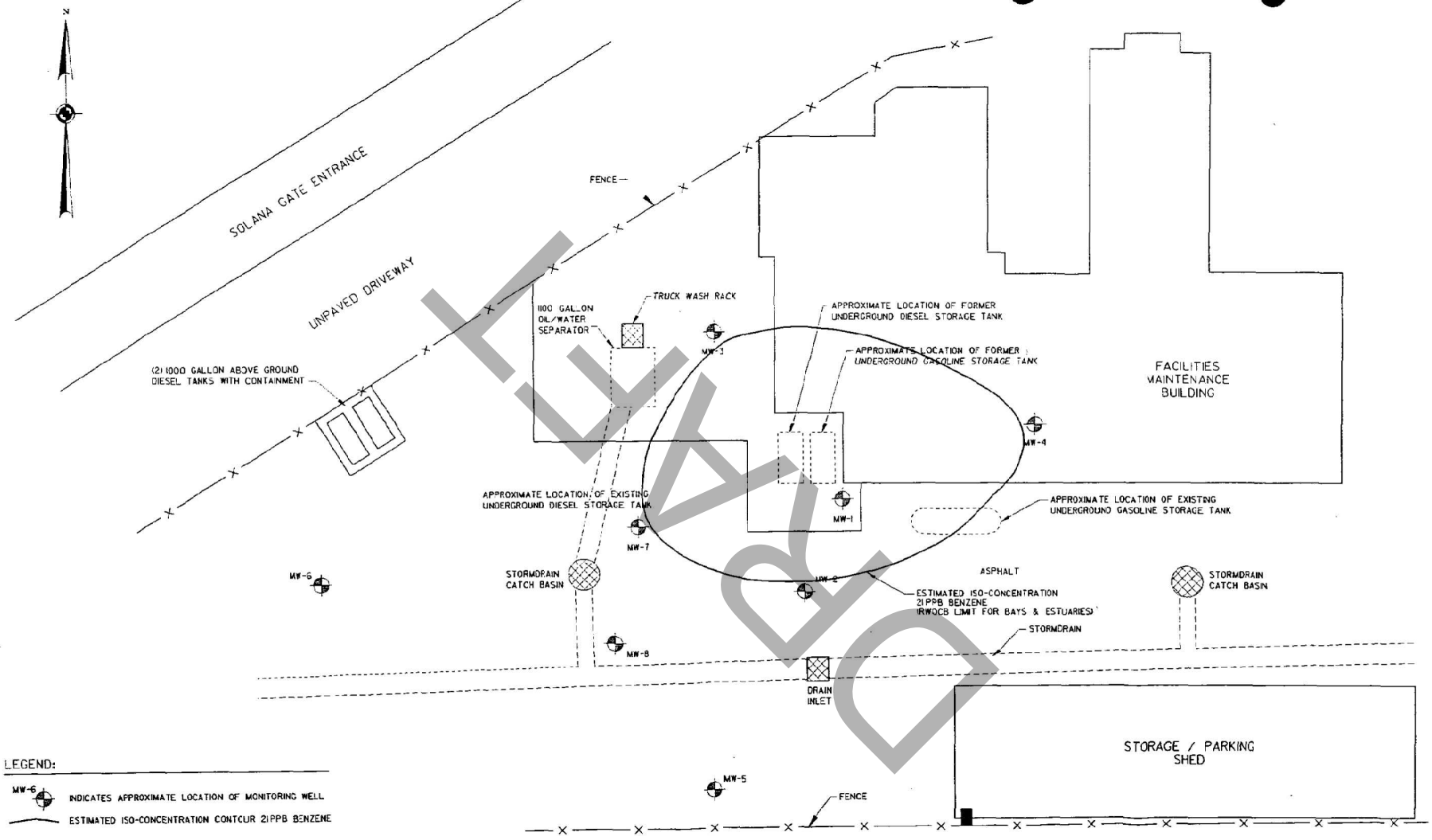
Sincerely,

Laurence S. Reider, P.E.
Project Manager
Metcalf & Eddy, Inc.

KAW:cw
Enclosure

cc: Patricia Butler, BRG Consulting
Craig Fravel, DMTC

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NOTE: SITE PLAN BASED ON FIGURE 1, "REPORT OF SEMI-ANNUAL GROUNDWATER SAMPLING, DEL MAR THOROUGHBRED CLUB", SEPTEMBER 1994

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Metcalf & Eddy
701 B STREET, SUITE 1100
SAN DIEGO, CA. 92101

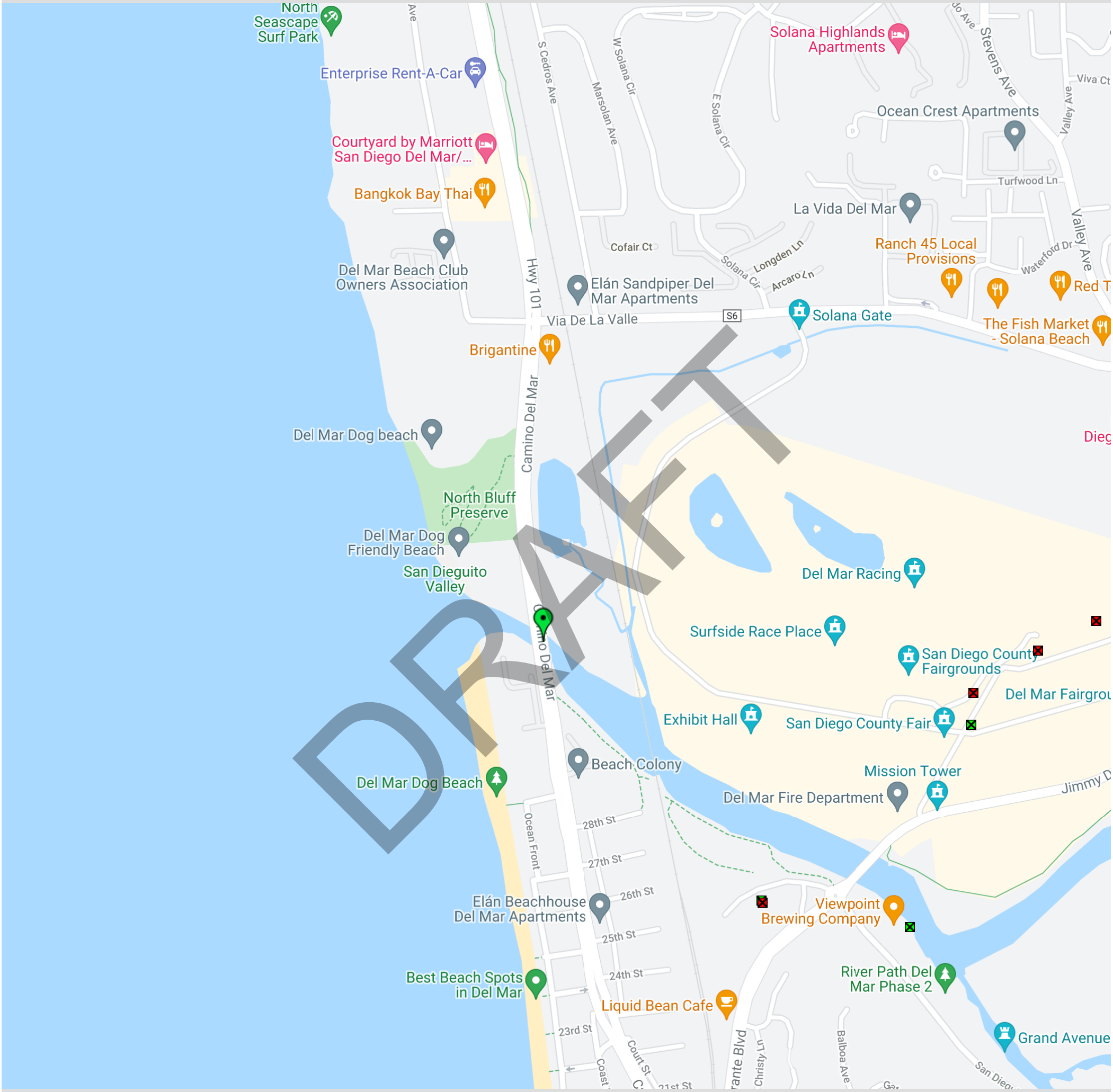
DEL MAR THOROUGHBRED CLUB — DEL MAR, CA

ESTIMATED LOCATION OF BENZENE IMPACTS

FIGURE 1

nmyer
26-MAR-1997 08:37

Search for a Project | Search for an Address | Home | Download Data | Tools | Contact Us



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LEGEND - CHOOSE MORE SITES

- LUST Cleanup Sites - REMOVE
- Cleanup Program Sites - REMOVE
- Military Cleanup Sites - REMOVE
- Military Privatized Sites - REMOVE
- Military UST Sites - REMOVE

Signifies a Closed Site

ACTIVE MAP COVERAGES:

- Military Bases - REMOVE

LIST SITES VISIBLE ON MAP

100 m

Map data ©2021 Google

Sites Shown on Map: 13 Total Sites | 0 Open Sites | 13 Closed Sites | 2 Sites w/Water Quality Data

EnviroStor Database

envirostor.dtsc.ca.gov/public/map/?myaddress=camino+del+mar

ENVIROSTOR

camino del mar

Map Address

Sites and Facilities

Cleanup Sites

- Federal Superfund
- State Response
- Voluntary Cleanup
- School Cleanup
- Evaluation
- School Investigation
- Military Evaluation
- Tiered Permit
- Corrective Action
- Field Points

STATUS

All Statuses

Permitted Sites

- Operating
- Post-Closure
- Non-Operating

Other Sites

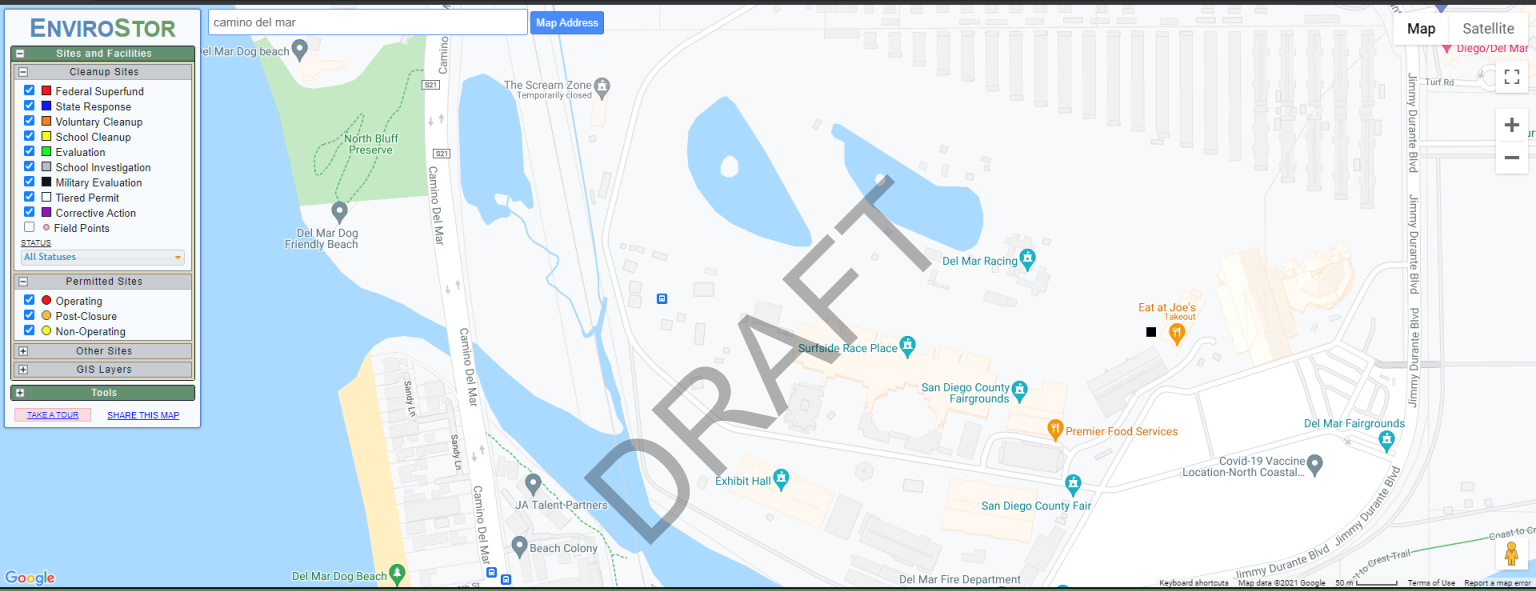
GIS Layers

Tools

TAKE A TOUR SHARE THIS MAP

Map Satellite

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SITES CURRENTLY VISIBLE ON MAP — 1 SITES LISTED — EXPORT THIS LIST TO EXCEL

PROJECT NAME	STATUS	PROJECT TYPE	ADDRESS	CITY
CAMP C.J. MILLER	INACTIVE - NEEDS EVALUATION	MILITARY EVALUATION		DEL MAR

CA7328A1_Camp_....pdf

Show all

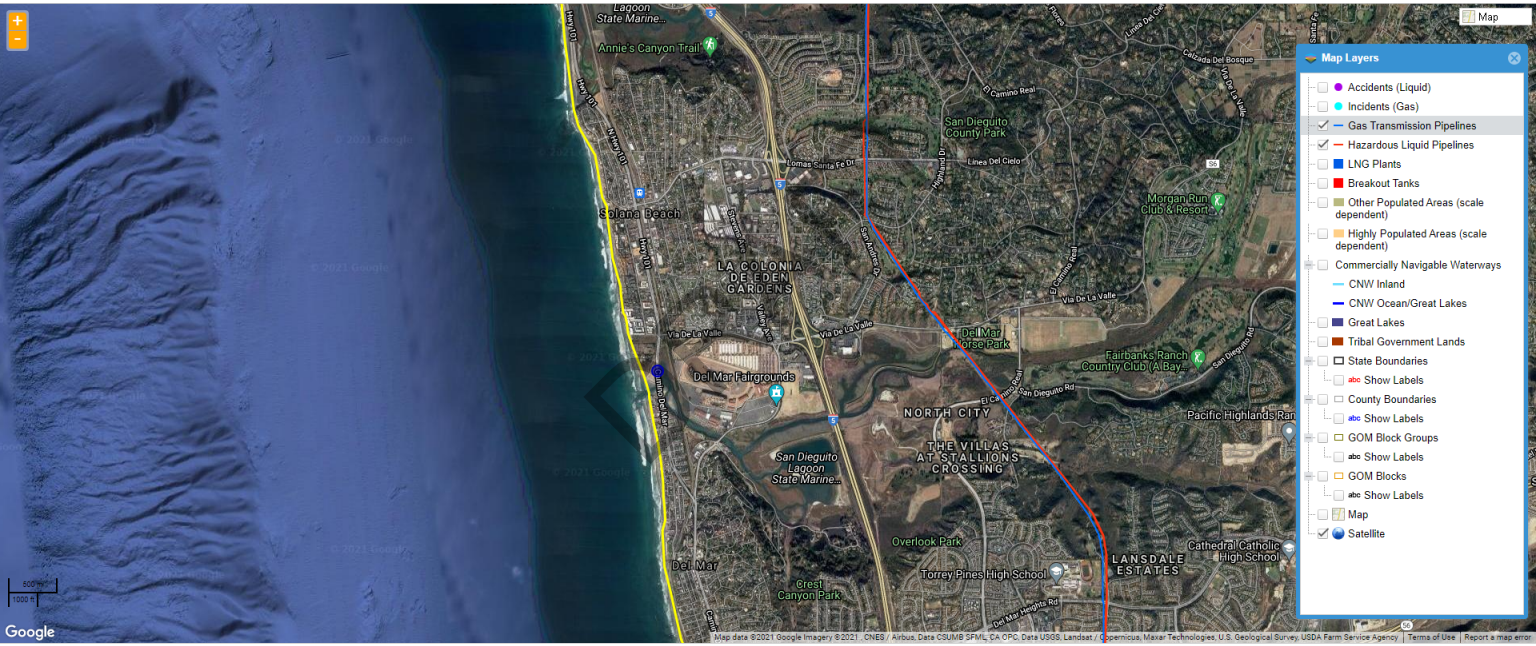
NPMS Public Viewer

pvnpms.phmsa.dot.gov/PublicViewer/

Public Viewer

Log Out | Change County

Map Layers | Query Tools | Enter search term (min 4 chars) | Help



Ready | Zoom Level: 14 of 19 (1:24,000) Closest Zoom for Pipelines | 32.972409, -117.339245 | COUNTY : San Diego, CA

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APPENDIX D
HISTORICAL SOURCES DOCUMENTATION

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Camino Del Mar Bridge Project

Del Mar

Solana Beach, CA 92075

Inquiry Number: 6515458.3

June 01, 2021

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Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

06/01/21

Site Name:

Camino Del Mar Bridge Project
Del Mar
Solana Beach, CA 92075
EDR Inquiry # 6515458.3

Client Name:

Kleinfelder, Inc.
550 W. C Street, Suite 1200
San Diego, CA 92101
Contact: Stefan Birardi

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Certified Sanborn Results:

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Project 20180876.001A

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Camino Del Mar Bridge Project

Del Mar

Solana Beach, CA 92075

Inquiry Number: 6515458.8

June 01, 2021

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The EDR Aerial Photo Decade Package

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Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

06/01/21

Site Name:

Camino Del Mar Bridge Project
Del Mar
Solana Beach, CA 92075
EDR Inquiry # 6515458.8

Client Name:

Kleinfelder, Inc.
550 W. C Street, Suite 1200
San Diego, CA 92101
Contact: Stefan Birardi

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Search Results:

Year	Scale	Details	Source
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2005	1"=500'	Flight Year: 2005	USDA/NAIP
2002	1"=500'	Acquisition Date: January 01, 2002	USGS/DOQQ
1997	1"=500'	Acquisition Date: October 16, 1997	USGS/DOQQ
1994	1"=500'	Acquisition Date: January 01, 1994	USGS/DOQQ
1990	1"=500'	Flight Date: September 06, 1990	USDA
1985	1"=500'	Flight Date: September 13, 1985	USDA
1979	1"=500'	Flight Date: January 27, 1979	EDR Proprietary Landiscor
1970	1"=500'	Flight Date: March 06, 1970	EDR Proprietary Landiscor
1966	1"=500'	Flight Date: November 02, 1966	USGS
1964	1"=500'	Flight Date: April 08, 1964	USDA
1953	1"=500'	Flight Date: April 14, 1953	USDA
1949	1"=500'	Flight Date: February 16, 1949	USDA
1939	1"=500'	Flight Date: April 16, 1939	USDA
1928	1"=500'	Flight Date: November 01, 1928	EDR Proprietary Landiscor

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INQUIRY #: 6515458.8

YEAR: 2016

= 500'

N

EDR



INQUIRY #: 6515458.8

YEAR: 2012

= 500'

N

EDR



INQUIRY #: 6515458.8

YEAR: 2009

= 500'

N

EDR



INQUIRY #: 6515458.8

YEAR: 2005

= 500'

N

EDR



INQUIRY #: 6515458.8

YEAR: 2002

= 500'

N

EDR



INQUIRY #: 6515458.8

YEAR: 1997

= 500'

N

EDR



INQUIRY #: 6515458.8

YEAR: 1994

= 500'

N

EDR



INQUIRY #: 6515458.8

YEAR: 1990

= 500'

N

EDR



INQUIRY #: 6515458.8

YEAR: 1985

= 500'

N

EDR



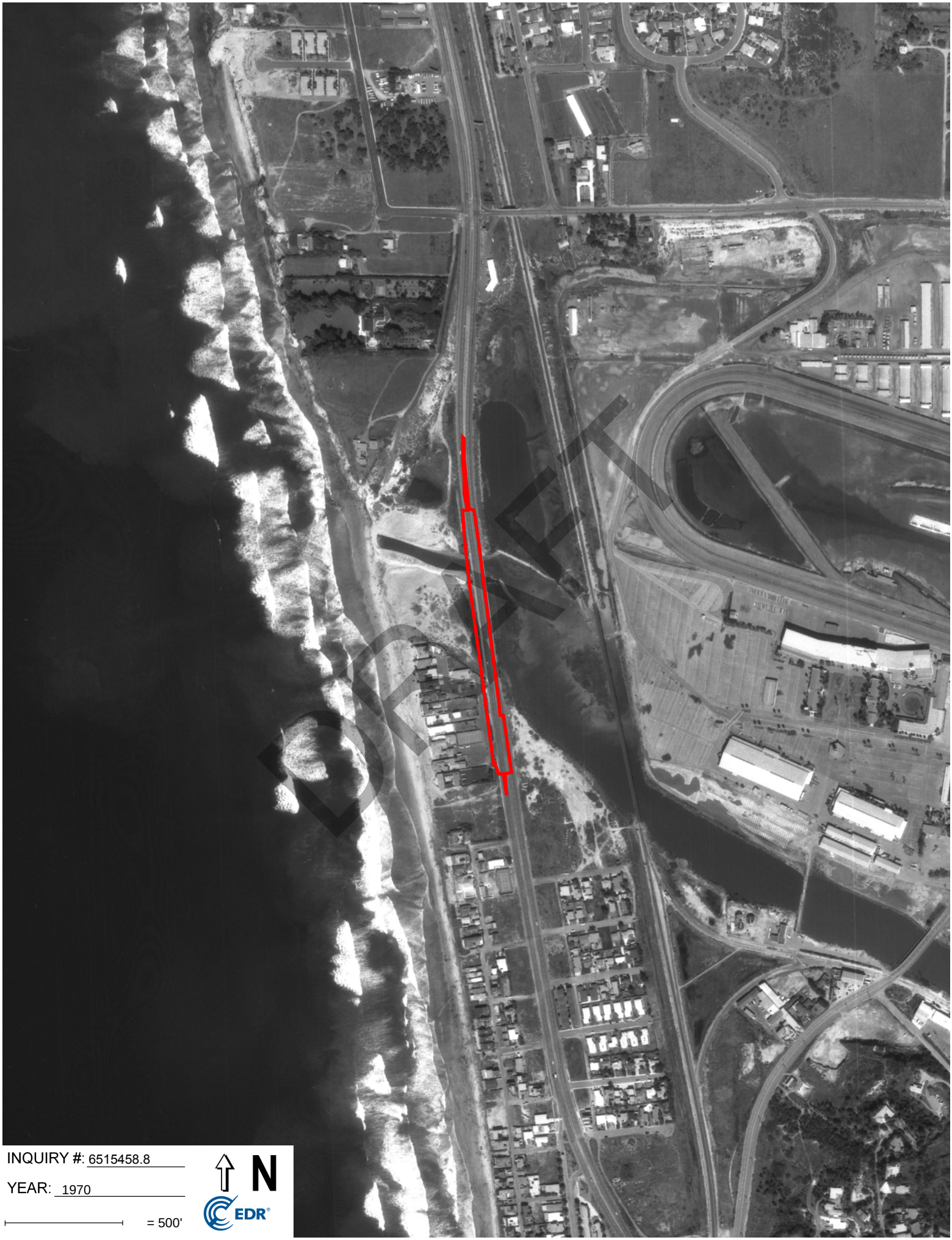
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YEAR: 1979

= 500'

N

EDR


DRAFT
INQUIRY #: 6515458.8
YEAR: 1970
= 500'
N
EDR



INQUIRY #: 6515458.8

YEAR: 1966

= 500'

N

EDR


DRAFT
INQUIRY #: 6515458.8
YEAR: 1964
= 500'
N
EDR



INQUIRY #: 6515458.8

YEAR: 1953

= 500'

N

EDR



INQUIRY #: 6515458.8

YEAR: 1949

= 500'

N

EDR



INQUIRY #: 6515458.8

YEAR: 1939

= 500'

N

EDR



INQUIRY #: 6515458.8

YEAR: 1928

= 500'

N

EDR

Camino Del Mar Bridge Project

Del Mar

Solana Beach, CA 92075

Inquiry Number: 6515458.4

June 01, 2021

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EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

06/01/21

Site Name:	Client Name:
Camino Del Mar Bridge Project	Kleinfelder, Inc.
Del Mar	550 W. C Street, Suite 1200
Solana Beach, CA 92075	San Diego, CA 92101
EDR Inquiry # 6515458.4	Contact: Stefan Birardi

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Kleinfelder, Inc. were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		*Coordinates:*	
P.O.#	NA	**Latitude:**	32.975423 32° 58' 32" North
Project:	20180876.001A	**Longitude:**	-117.269037 -117° 16' 9" West
		UTM Zone:	Zone 11 North
		UTM X Meters:	474860.68
		UTM Y Meters:	3648594.47
		Elevation:	10.40' above sea level

Maps Provided:

2012
1994
1975
1967
1953

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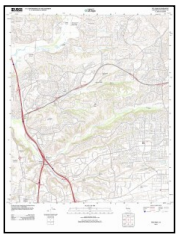
Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2012 Source Sheets



Del Mar OE W
2012
7.5-minute, 24000



Del Mar
2012
7.5-minute, 24000

1994 Source Sheets



Del Mar
1994
7.5-minute, 24000
Aerial Photo Revised 1994

1975 Source Sheets



Del Mar
1975
7.5-minute, 24000
Aerial Photo Revised 1966

1967 Source Sheets



Del Mar
1967
7.5-minute, 24000
Aerial Photo Revised 1966

DRAFT

Topo Sheet Key

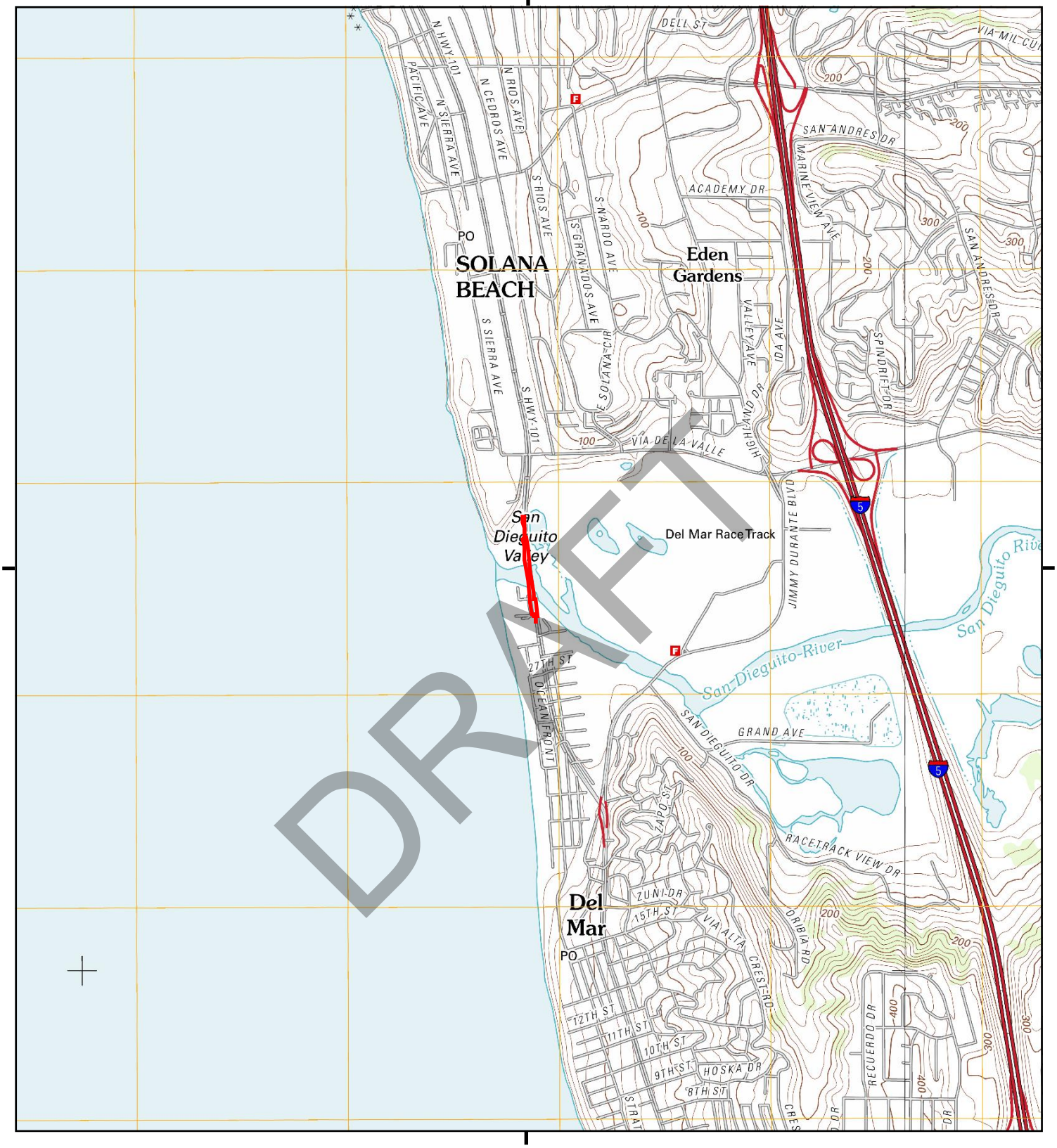
This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1953 Source Sheets



Del Mar
1953
7.5-minute, 24000
Aerial Photo Revised 1950

DRAFT



DRAFT

This report includes information from the following map sheet(s).

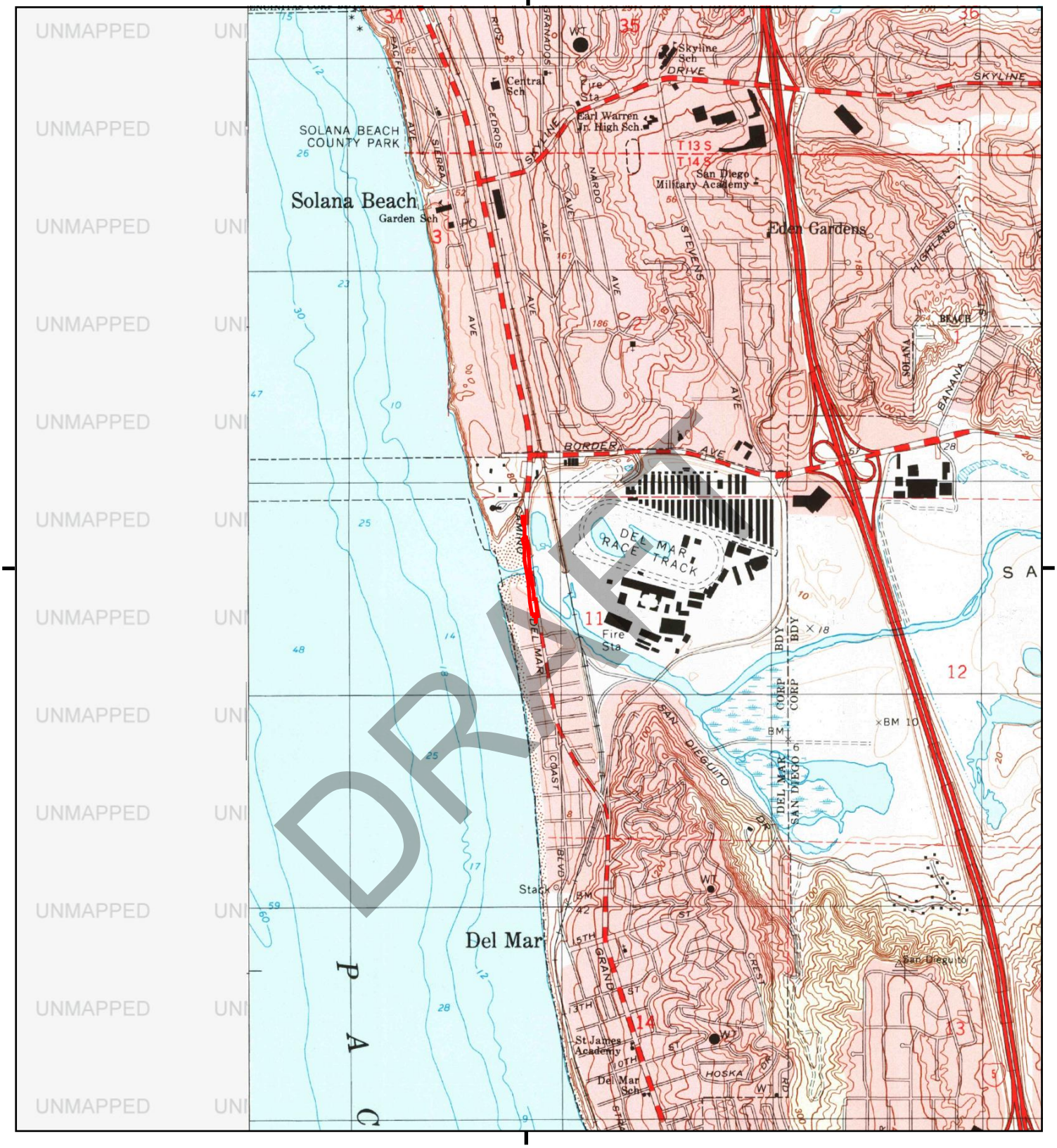
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Del Mar OE W, 2012, 7.5-minute
SE, Del Mar, 2012, 7.5-minute

SITE NAME: Camino Del Mar Bridge Project
ADDRESS: Del Mar
Solana Beach, CA 92075
CLIENT: Kleinfelder, Inc.

N



DRAFT

This report includes information from the following map sheet(s).

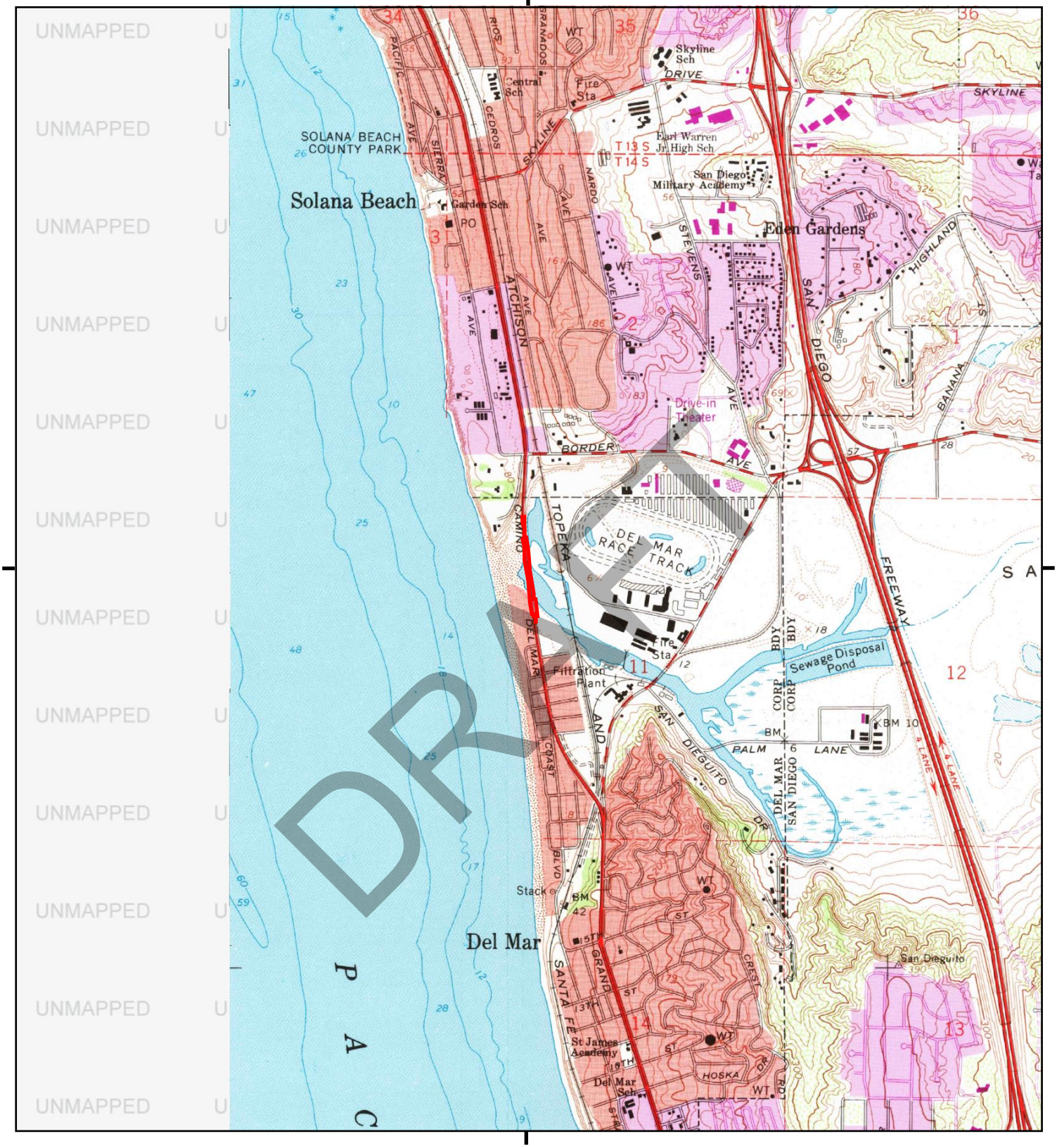
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Del Mar, 1994, 7.5-minute

SITE NAME: Camino Del Mar Bridge Project
ADDRESS: Del Mar
Solana Beach, CA 92075
CLIENT: Kleinfelder, Inc.

N



DRAFT

This report includes information from the following map sheet(s).

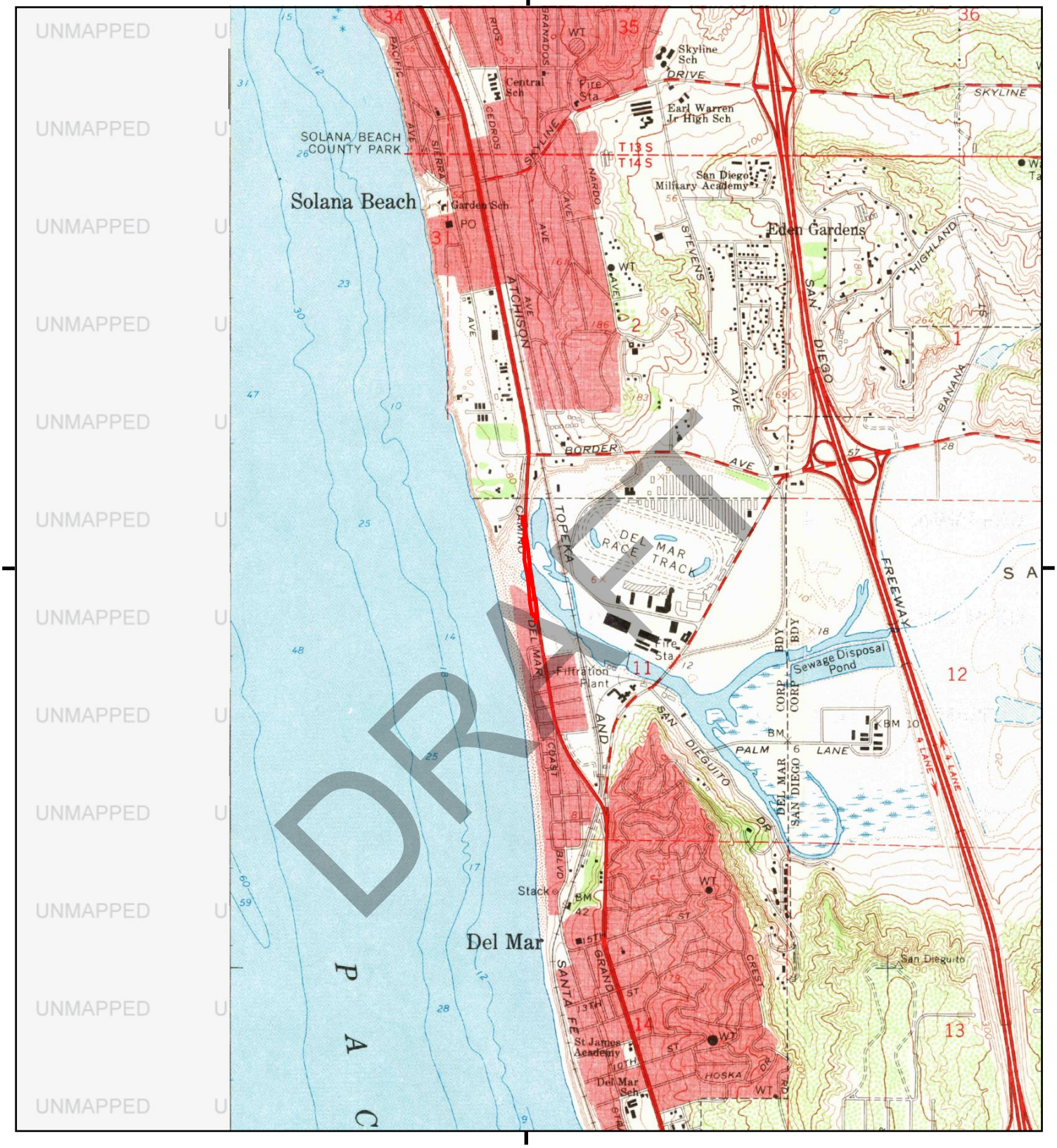
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Del Mar, 1975, 7.5-minute

SITE NAME: Camino Del Mar Bridge Project
ADDRESS: Del Mar
Solana Beach, CA 92075
CLIENT: Kleinfelder, Inc.

N



This report includes information from the following map sheet(s).

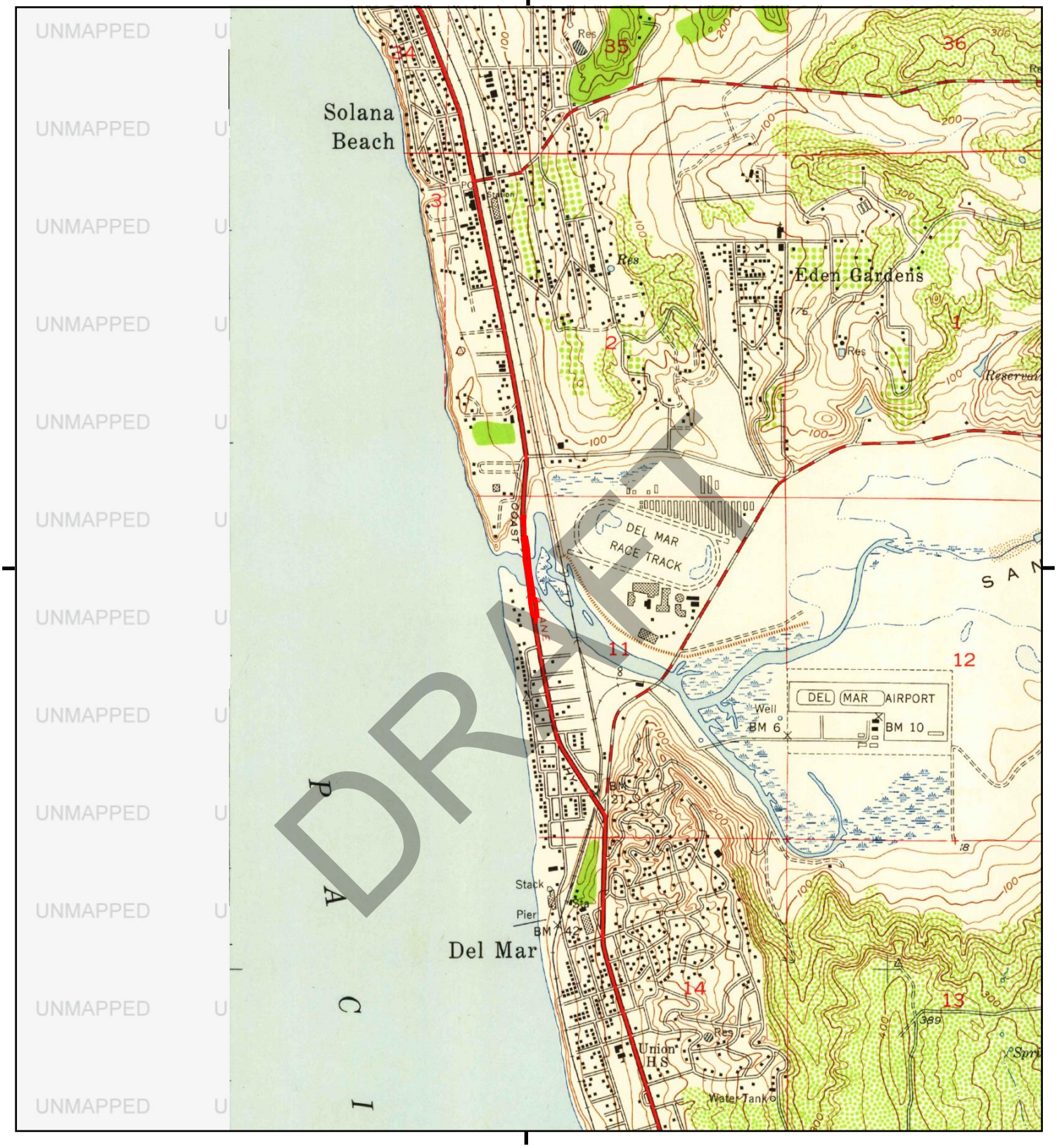
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Del Mar, 1967, 7.5-minute

SITE NAME: Camino Del Mar Bridge Project
ADDRESS: Del Mar
Solana Beach, CA 92075
CLIENT: Kleinfelder, Inc.

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Del Mar, 1953, 7.5-minute

SITE NAME: Camino Del Mar Bridge Project
ADDRESS: Del Mar
Solana Beach, CA 92075
CLIENT: Kleinfelder, Inc.

N

Camino Del Mar Bridge Project
Del Mar
Solana Beach, CA 92075

Inquiry Number: 6515458.5
June 03, 2021

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The EDR-City Directory Image Report

EDR® Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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Findings

City Directory Images

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

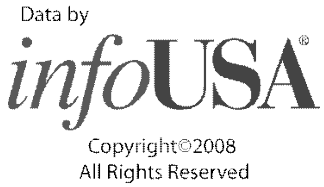
DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RECORD SOURCES

EDR's Digital Archive combines historical directory listings from sources such as Cole Information and Dun & Bradstreet. These standard sources of property information complement and enhance each other to provide a more comprehensive report.

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RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2017	☑	☐	EDR Digital Archive
2014	☑	☐	EDR Digital Archive
2010	☑	☐	EDR Digital Archive
2005	☑	☐	EDR Digital Archive
2000	☑	☐	EDR Digital Archive
1995	☑	☐	EDR Digital Archive
1992	☑	☐	EDR Digital Archive
1986	☑	☐	Haines Criss-Cross Directory
1982	☑	☐	Haines Criss-Cross Directory
1979	☑	☐	Haines Criss-Cross Directory
1975	☑	☐	Haines Criss-Cross Directory
1969	☑	☐	North Shore Directory Co

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FINDINGS

TARGET PROPERTY STREET

Del Mar
Solana Beach, CA 92075

Year	*CD Image*	*Source*
CAM DEL MAR		
1995	pg A55	EDR Digital Archive
CAMINO DEL MAR		
2017	pg A2	EDR Digital Archive
2014	pg A11	EDR Digital Archive
2010	pg A20	EDR Digital Archive
2005	pg A31	EDR Digital Archive
2000	pg A43	EDR Digital Archive
1995	pg A58	EDR Digital Archive
1992	pg A64	EDR Digital Archive
1986	pg A73	Haines Criss-Cross Directory
1986	pg A74	Haines Criss-Cross Directory
1986	pg A75	Haines Criss-Cross Directory
1982	pg A76	Haines Criss-Cross Directory
1979	pg A77	Haines Criss-Cross Directory
1979	pg A78	Haines Criss-Cross Directory
1979	pg A79	Haines Criss-Cross Directory
1975	pg A80	Haines Criss-Cross Directory
1975	pg A81	Haines Criss-Cross Directory
1975	pg A82	Haines Criss-Cross Directory

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FINDINGS

CROSS STREETS

Year	*CD Image*	*Source*

CAMINO DEL MAR

1969	pg. A83	North Shore Directory Co
1969	pg. A84	North Shore Directory Co
1969	pg. A85	North Shore Directory Co

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City Directory Images

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Target Street	Cross Street	Source
✓	-	EDR Digital Archive

CAMINO DEL MAR 2017 (Cont'd)

1555	SHIMBASHI LLC
	SMASHBURGER
	STUDIO STRATTON
	SUNGLASS HUT
	SUNSET YOGURT
	THREE DOG BAKERY
1562	AURENTZ, VINCENT
	BALTINS, ANDRIS A
	BECKWITH, GERALD
	EDELSHAIN, YASUKO O
	FRANKFURTH, SAMANTHA
	GRUBB, ALAN L
	HATOS, SHIRLEY P
	HATOS, STEFAN
	KUNKLE, LYNN R
	LITT, KIMBERLY
	MARCIA, HODGES
	MONAGHAN, MEADOW
	MORRIS, JERRY
	NOUSKAJIAN, NORMAN
	PROLMAN, JILL
	TAYLOR, FLETCHER
	VISCARDI, ANTHONY P
	WOO, WILBUR
	WRIGHT, TERRY
1616	OSTER, ADRIENNE N
	VIRTUAL GROUP LLC
1650	NORMAN NOUSKAJIAN ATTY
1654	KWANSY, LINDA
1844	CALLAHAN, GRANT K
	DELMAR, BEACH V
	FOURNIER, SURBHI
	HARTL, HARRIET F
	MACKEN, JASON
	MCLAUGHLIN, SEAN
	MOSER, JOSEPH E
	MOTOLA, SCOTT M
	PRICE, HERSHELL P
	REED, HUNTER
	ROSEN, WARREN
	SIMPSON, PATRICK A
	TAUBE, ERIKA V
	VALENTINO, ANTHONY J
	VOGT, ERIK
	WILLIAMS, DANIELLE
	YARBROUGH, TODD J
2305	GOLDNER, RICHARD
2315	MCCLELLAN, JAY S
2403	BIRCH, HALL
2411	MENGHINI, SCOTT J

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Target Street	Cross Street	Source
✓	-	EDR Digital Archive

CAMINO DEL MAR 2017 (Cont'd)

2427	HAHN, ERNEST
2435	BARNES, STEVEN T
2515	BUKOVSKY, JASON
	CORNWELL, KIMBERLY S
	ESENER, SEMA
	FONTESS, MATTHEW
	HANES, M
	HOPPE, LEON
	MCLAUGHLIN, KELLY J
	NORMENT, GEORGE H
	RODRIGUEZ, M
	STEINMETZ, MARK
2617	WALKER, JEFFREY
2625	EVANGELISTI, O
2713	TEIXEIRA, MARK F
2717	BROWN, DAVID J
2721	BRADSHAW, DOROTHY S
2725	DAVIDSON, DAVID W
2727	SAVAGLIO BARBARA B
2729	GIGGINS, HEATHER J
2731	MATTERN, JOHN R
2733	CILCH, HERBERT S
2801	BLACKLEDGE, RONALD A
	CIAGLIA, STEPHANIE
	FAIRBANKS, STEELE J
	FISHMAN, KIM S
	LONG, DIANA
	RUEHL, BRIANNA K
2803	BAIN, TRAVIS
	GALLUP, RICHARD P
	GIBSON, LEIGH J
	MEGAN, LING M
	ODRISCOLL, JOSEPH T
2805	DILLARD, CHELSIE
	HALLER, HARRY
	KENNEY, MITCH
	LAMPE, JEFF A
	LEW, MA
	MCGRAIL, RENEE E
	STAFFORD, MAUREEN L
2809	BLAIR, VANESSA
	BRUSTAD, JASON W
	DAY, VIRGINIA
	DULFON, BARRY J
	MILLER, CORTNEY
	WENZL, HANS
	ZARAFSHAN, MAHDAD
2811	DELVECCHIO, DIANE
	MERKER, STEVEN L
	WALDION, MICHAEL

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Target Street	Cross Street	Source
✓	-	EDR Digital Archive

CAMINO DEL MAR 2017 (Cont'd)

2811	WALLACE, JANE M
2815	CUBIRA, AMNA
	MORRIS, MICHAEL P
	REHAB HOLMES
	STOUT, CHARLES
2817	ARNOLD, JOAN
	GARCIA, MARIA
	GENSLER, KENNETH W
	KENYON, JON
	MCLELLAN, MERRILY A
2819	CANNING, CHRIS C
	DICKERSON, DONALD
	GALLO, DAVID W
	KEMPF, JOHN J
	MOLSBERRY, TROY D
	SHERWIN, MARY
	SILLICK, JOHN
2820	JACOBS, GARY E
2821	AYALA, DAN
	BEACH COLONY
	BELIN, ANDREW
	BLEASE, JULIE A
	COTE, RICHARD
	FOSTER, JAMES D
	HOBACH, HENRY J
	MILLER, CHRISTOPHER D
	SAKAMOTO, LANCE I
	WAINWRIGHT, ERIK P
2823	LARSON, PRESTON J
	MAIMONE, JOHN J
	MAXWELL, DAVID J
	ORTH, SHERLY R
	RODRIGUEZ, ISIDRO
2825	CALIFORNIA PRINTING & GRAPHICS
	MARK, JOSEPH M
2830	ROBISON, JAMES
2928	MEYERS, KIMBERLEY
2932	FURGATCH, HARVEY S
3263	THE BRIGANTINE SEAFOOD RESTAURANTS

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Target Street	Cross Street	Source
✓	-	EDR Digital Archive

CAMINO DEL MAR 2014 (Cont'd)

1844 VOGT, ERIK
VONTAUBE, ALEXANDER F
2305 CASTIGLIONI, PAOLA
KUHLEN, CHRISTIAN V
REILLY, JOAN A
WIYGUL, BRAD
2315 MCCLELLAN, C
2403 HILLBROOK INTERNATL
HILLBROOK, ROGER W
2405 FLETCHER, JACQUELINE H
2411 OCCUPANT UNKNOWN,
2413 OCCUPANT UNKNOWN,
2427 HAHN, ERNEST
2435 OCCUPANT UNKNOWN,
2515 ENGLISH, TIFFANY H
LOBAY, NATALYA
LUJAN, HELEN
MCLAUGHLIN, KELLY J
OTIS, JESSE M
2609 OCCUPANT UNKNOWN,
2625 EVANGELISTI, O
2705 OCCUPANT UNKNOWN,
2707 HAYTON, BRUCE A
2709 OCCUPANT UNKNOWN,
2711 KLEIN, BARBARA A
2715 COHEN, RIO
2717 BROWN, DAVID J
2719 HONACO, DANIEL R
2721 BRADSHAW, DOROTHY S
2722 OCCUPANT UNKNOWN,
2723 OCCUPANT UNKNOWN,
2725 DAVIDSON, DAVID W
2727 OCCUPANT UNKNOWN,
2729 OCCUPANT UNKNOWN,
2730 CHARNHOLM, ERIC J
2731 MATTERN, G
2735 OCCUPANT UNKNOWN,
2801 BLACKLEDGE, RONALD A
CIAGLIA, STEPHANIE
DOLCE, MARIA
2803 ARMBRUST, NATALIE
CANNING, CHRIS C
ODONNELL, SCOTT
SHERKAT, NUSHIN
2805 ASKEY, VINCE M
BELL, BRIAN W
JENKINS, REBECCA A
MCLELLAN, MERRILY A
MICHIE, BRIAN
PANDURU, FLAVIA F

DRAFT

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

CAMINO DEL MAR 2014 (Cont'd)

2805 SCHOULTZ, L
SCRIVANO, ANGELA
SOWDEN, BENET T
2809 DULFON, BARRY J
MELTZER, JORDAN
PALM, MELANIE D
WENZL, HANS
2811 FAIRBANKS, STEELE J
SLOAN, MARK K
WALDION, MICHAEL
WALLACE, JANE M
2815 CUBIRA, AMNA
DORDEL, SARAH A
SOWDEN, ERIN
SPENCE, CHRIS
2817 ABDI, MANDY
ARNOLD, BRANDON W
BRENNAN, ASHLEY R
TUCKER, JIM G
2819 AMBS, KRISTI J
GALLO, DAVID W
KEMPF, JOHN J
MCGRAIL, RENEE E
2820 JACOBS, GARY E
2821 BEACH COLONY
COTE, RICHARD
DEERMAN, GREGORY
EGGUM, JOHN J
FILSON, REBECCA A
LAZZARO, LYN
ROBBINS, BRIONNA
2823 HUFFMAN, SHARON
LARSON, PRESTON J
MAXWELL, DAVID J
OLIVER, JONATHAN D
RAMACHANDRAN, RANGANATHAN
RODRIGUEZ, VANESSA
2825 CALIFORNIA PRINTING & GRAPHICS
COIN, JOANNE M
MARK, JOSEPH M
PENTER, DEBORAH A
RODRIGUES, KAREN M
WICKMAN, CALEB W
2830 ROBISON, JAMES
2928 OCCUPANT UNKNOWN,
2932 FURGATCH, HARVEY S
3263 BRIGANTINE SEAFOOD RESTAURANT

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CAMINO DEL MAR 2010 (Cont'd)

2727 OCCUPANT UNKNOWN,
2729 OCCUPANT UNKNOWN,
2730 CHARNHOLM, ERIC J
2731 OCCUPANT UNKNOWN,
2733 OCCUPANT UNKNOWN,
2735 OCCUPANT UNKNOWN,
2801 BELIN, ANDREW
CLEMENTS, JASON S
MORENO, LUIS A
2803 GOOLSBY, FLOYD A
PILAND, CRAIG A
2805 ASKEY, VINCE M
BRAUM, OSCAR
GALLI, LOGAN
SCHOULTZ, L
SLOAN, MARK K
2809 CUDE, PERRY
LEW, MA
TRAN, ELISE
WENZL, HANS
2811 FAIRBANKS, STEELE J
FERNER, TOBY D
SFAKIANAKIS, LOUI E
WALLACE, JANE M
WILSON, DAVID M
2815 LY, TAUNA H
2817 WHITNEY, PATRICE L
2819 DENNY, KEVIN M
KEMPF, JOHN J
OCONNOR, NANCY V
OLEARY, DEBRA
2820 JACOBS, GARY E
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BOLAS, JACQUELIN M
COOPER, TRACY U
FILSON, REBECCA A
LAZZARO, LYN
POWELL, ROBERT M
2823 BRUCE, PHIL C
CASEY, ANDREW R
DEAL, JEREMY
FRIEDMAN, JILL D
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COIN, JOANNE
CULVER, SHERRY
2830 NICHOLAS, ARTHUR E

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	MILLER, DANIEL
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	SEBOLT, RONNIE E
	SHAFFER, DAVID H
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	JAMES JAMIESON
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1801	OCCUPANT UNKNOWN,
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	FOUNTAIN YOUTH YOGA
	GALER, SHAWN P
	GRAESER, VALERIE A
	HELMBACHER, KEITH M
	LUCKINBILL, BRAD A
	MUDGE, E T
	POLK, CHARLES W
	PRICE, HERSHELL T
	RANCHO SANTA FE REAL ESTATE CO
	SEABRIGHT, HOWARD
	SHEPANEK, KARI S
	SILBERT, WALTER K
	SILVER AGE YOGA CMNTY OTRCH
	SILVER AGE YOGA COMMUNITY OUTREACH
	THE MORTGAGE STORE
	TSOULOS, JENNIFER M
2305	DROGE, ARTHUR J
	STROM, STEPHANIE
2315	MCCLELLAN, JAY S
2403	OCCUPANT UNKNOWN,
2411	FENWICK, BRIAN
2413	BUONAIUTO, NICK
2427	RAY, LAURIE
2435	NAIMEH, TANHA
2515	CADWELL, GUY C
	DAVIS, REBECCA R
	FAMILY HEALTHCARE SERVICES INC
	HANSEN, THOMAS W
	HOLDER, WILLIAM
	JORGENSEN, SARA
	NOR, FABIO H
	SCULL, MATTHEW S

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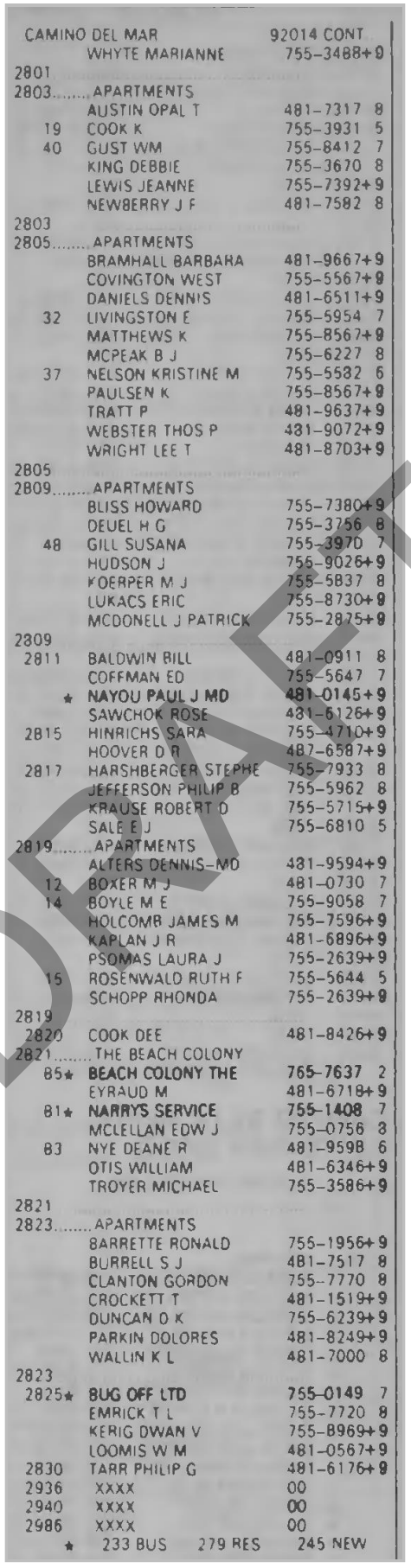
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	HOLMWOOD, ROBIN
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	MACIEL, D
	MCPHERSON, ANGUS
	MORENO, LUIS
	PARKER, DAVID J
	SCHICK, NICOLE
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	LUCKY, KRISTYN
	NORDTVEDT, STEVEN
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	PILAND, CRAIG A
	TWIGG, TIM
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	GLADSTONE, MATTHEW
	SCHAUB, MICHAEL
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	WILLIAMS, KAREN
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CAMINO DEL MAR 1979

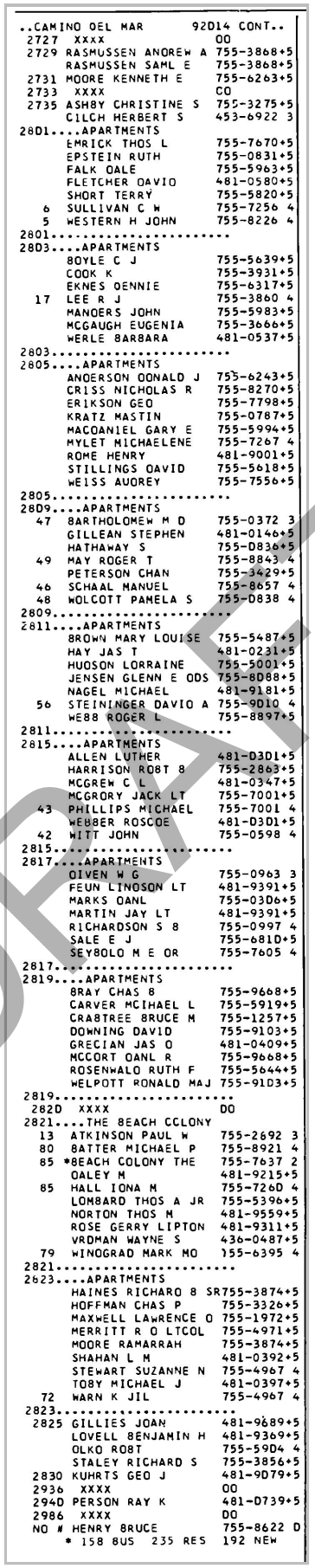


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	KING DEBBIE	755-3670	8
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	MCPEAK B J	755-6227	8
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	TRATT P	481-9637+9	
	WEBSTER THOS P	481-9072+9	
	WRIGHT LEE T	481-8703+9	
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	DEUEL H G	755-3756	8
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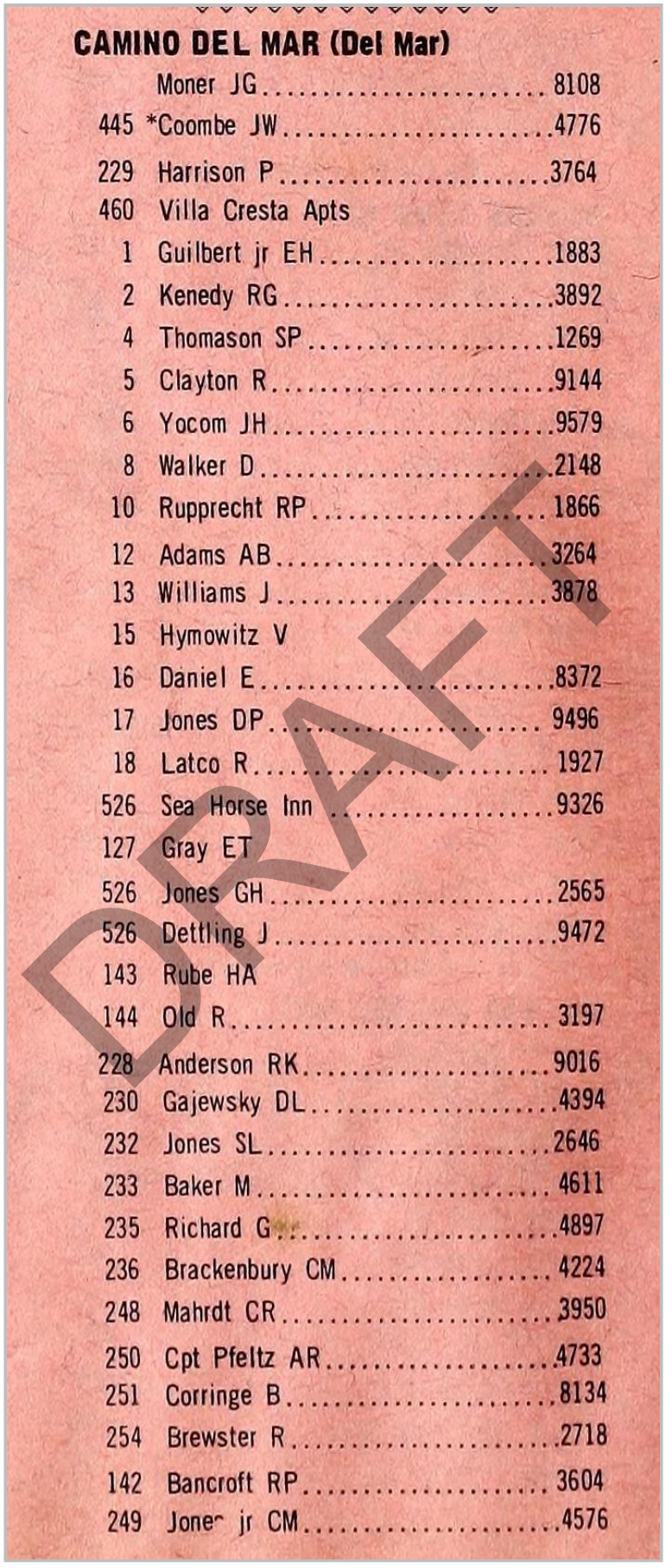


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Target Street	Cross Street	Source
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CAMINO DEL MAR 1969



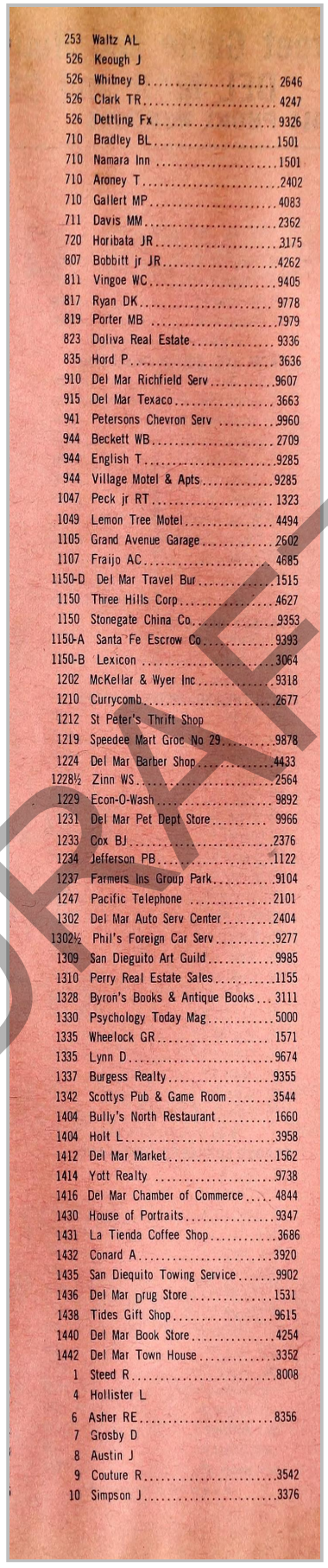
CAMINO DEL MAR (Del Mar)

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5 Clayton R 9144
6 Yocom JH 9579
8 Walker D 2148
10 Rupprecht RP 1866
12 Adams AB 3264
13 Williams J 3878
15 Hymowitz V
16 Daniel E 8372
17 Jones DP 9496
18 Latco R 1927
526 Sea Horse Inn 9326
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526 Jones GH 2565
526 Dettling J 9472
143 Rube HA
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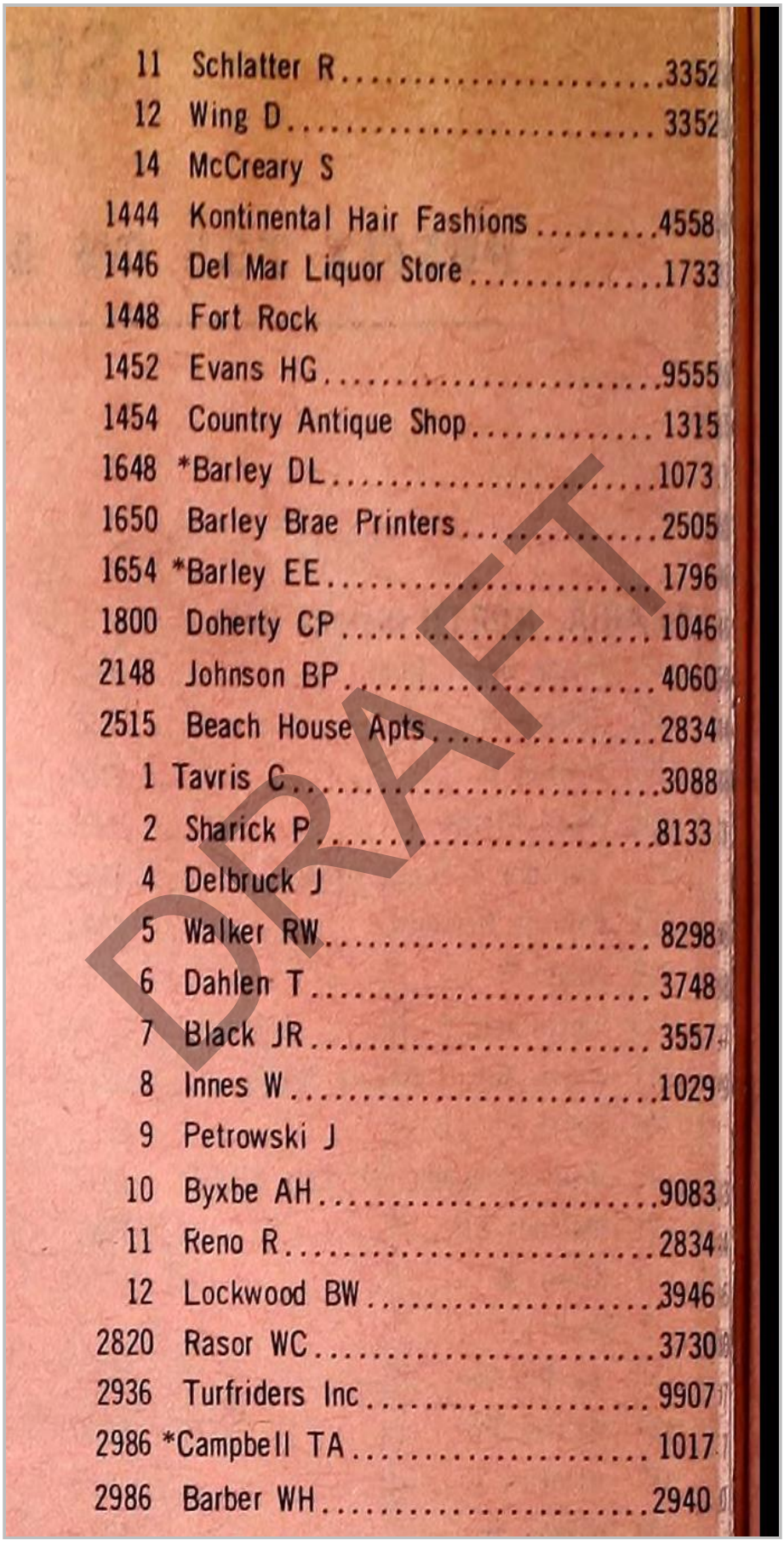


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915 Del Mar Texaco 3663
941 Petersons Chevron Serv 9960
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944 English T 9285
944 Village Motel & Apts 9285
1047 Peck jr RT 1323
1049 Lemon Tree Motel 4494
1105 Grand Avenue Garage 2602
1107 Fraijo AC 4685
1150-D Del Mar Travel Bur 1515
1150 Three Hills Corp 4627
1150 Stonegate China Co 9353
1150-A Santa Fe Escrow Co 9393
1150-B Lexicon 3064
1202 McKellar & Wyer Inc 9318
1210 Currycomb 2677
1212 St Peter's Thrift Shop
1219 Speedee Mart Groc No 29 9878
1224 Del Mar Barber Shop 4433
1228½ Zinn WS 2564
1229 Econ-O-Wash 9892
1231 Del Mar Pet Dept Store 9966
1233 Cox BJ 2376
1234 Jefferson PB 1122
1237 Farmers Ins Group Park 9104
1247 Pacific Telephone 2101
1302 Del Mar Auto Serv Center 2404
1302½ Phil's Foreign Car Serv 9277
1309 San Dieguito Art Guild 9985
1310 Perry Real Estate Sales 1155
1328 Byron's Books & Antique Books ... 3111
1330 Psychology Today Mag 5000
1335 Wheelock GR 1571
1335 Lynn D 9674
1337 Burgess Realty 9355
1342 Scottys Pub & Game Room 3544
1404 Bully's North Restaurant 1660
1404 Holt L 3958
1412 Del Mar Market 1562
1414 Yott Realty 9738
1416 Del Mar Chamber of Commerce 4844
1430 House of Portraits 9347
1431 La Tienda Coffee Shop 3686
1432 Conard A 3920
1435 San Diequito Towing Service 9902
1436 Del Mar Drug Store 1531
1438 Tides Gift Shop 9615
1440 Del Mar Book Store 4254
1442 Del Mar Town House 3352
1 Steed R 8008
4 Hollister L
6 Asher RE 8356
7 Grosby D
8 Austin J
9 Couture R 3542
10 Simpson J 3376

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CAMINO DEL MAR 1969



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9 Petrowski J
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2936 Turfriders Inc.....9907
2986 *Campbell TA.....1017
2986 Barber WH.....2940

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Appendix G

Hydraulics and Sediment Transport Report

DOCUMENT 4

HYDRAULIC AND SEDIMENT TRANSPORT ANALYSES FOR THE CAMINO DEL MAR BRIDGE REPLACEMENT ALTERNATIVES 1.1, 2.1, AND 9.2

(BRIDGE NO. 57C-0209)

June 4, 2020

Wayne W. Chang, MS, PE 46548

ChangConsultants

Civil Engineering ◦ Hydrology ◦ Hydraulics ◦ Sedimentation

P.O. Box 9496
Rancho Santa Fe, CA 92067
(858) 692-0760

FOR REVIEW ONLY

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Caltrans Criteria....14

APPENDIX

A. Proposed Condition Hydraulic Data and HEC-RAS Analyses

MAP POCKETS

FEMA Flood Profiles
Hydraulic and Sediment Transport Work Map
Preliminary Bridge Alternative Plans

FOR REVIEW ONLY

INTRODUCTION

The City of Del Mar proposes to replace the existing Camino Del Mar bridge (Bridge No. 57C-0209) over the San Dieguito River. The bridge is located within the city of Del Mar and carries Camino Del Mar (formerly US Highway 101) over the river. The bridge is immediately east of the Pacific Ocean and adjacent to the San Dieguito Lagoon mouth (see the Vicinity Map). The existing bridge is an eleven-span cast-in-place structure approximately 596-feet long and 61-feet wide with 54-foot span lengths. The bridge contains two vehicular lanes (northbound and southbound) with adjacent bike lanes, a raised median, and a pedestrian walkway along the west edge. The original bridge was constructed in 1932 and was widened in 1953. Repairs and crash test rails were added in 2001. The bridge is structurally deficient, so is on the Eligible Bridge List for rehabilitation.

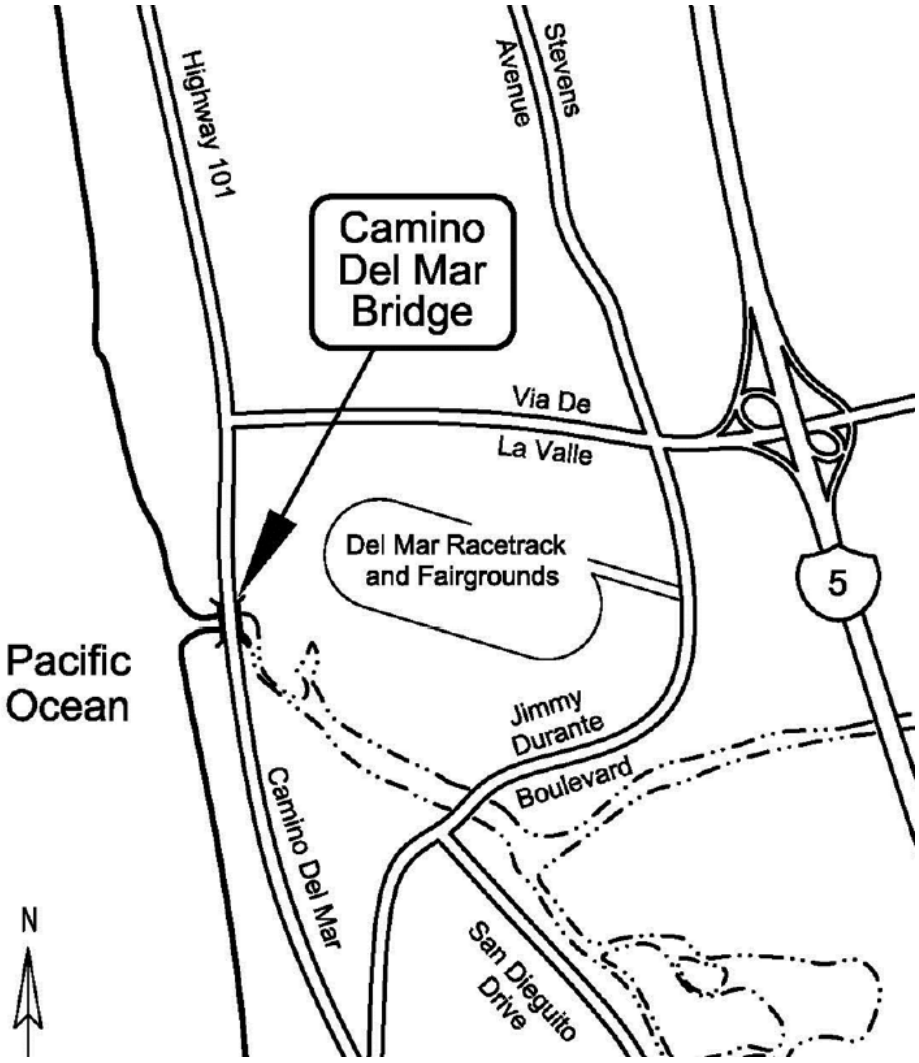


Figure 1. Vicinity Map

Kleinfelder initially developed nine preliminary bridge replacement alternatives labeled Alternative 1 through 9. The nine alternatives were analyzed in Chang Consultants' September 8,

2018, *Hydraulic and Sediment Transport Analyses for the Camino Del Mar Bridge Replacement*. Kleinfelder has now developed three refined alternatives labeled Alternative 1.1, 2.1, and 9.2, which are covered by this report. Bridge plans for the three alternatives are included in the map pocket. The alternatives will follow the same horizontal alignment as the existing bridge; however, the overall span will be lengthened to 624 feet and the width will be increased to 68.5 feet. The bridge profiles will be designed to provide the required freeboard. Each alternative includes semi-circular pedestrian overlooks spaced at intervals along both edges that extend 6 feet beyond the edges.

The bridge plans also include Alternatives 2.2 and 9.1. Alternative 2.2 is similar to Alternative 9.2 except for the pier spacing and haunches. Alternative 9.1 is similar to Alternative 2.1 except for the pier spacing and haunches. The haunches under all alternatives will be elevated above the design water surface elevations, so will not impact hydraulics or sediment transport. The pier spacing variations between Alternatives 2.2/9.2 and 2.1/9.1 will have minimal impact on hydraulics or sediment transport, so the Alternative 9.2 hydraulics will be similar to Alternative 2.2 and the Alternative 2.1 hydraulics will be similar to Alternative 9.1. Therefore, additional analyses were not performed for Alternatives 2.2 and 9.1.

The design variations between each alternative are as follows. Alternative 1.1 will contain a haunched superstructure with five spans and four sets of piers. The two end spans will be 109.5-feet long while the three middle spans will be 135-feet long. Each pier will contain two oblong (7.5-foot by 5-foot) flared columns. The columns will be supported by 10-foot diameter cast-in-drilled-hole (CIDH) piles within an 11-foot diameter casing. Alternative 2.1 will contain a haunched superstructure with six spans and five sets of piers. The two end spans will be 88-feet long while the four middle spans will be 112-feet long. Each pier will contain two oblong (7-foot by 4.5-foot) flared columns. The columns will be supported by 9-foot diameter CIDH piles within a 10-foot diameter casing. Alternative 9.2 will contain a constant depth superstructure with six spans and five sets of piers. All spans will be 104-feet long. Each pier will contain four 4-foot diameter circular columns. The columns will be supported by 6-foot diameter CIDH piles within a 7-foot diameter casing.

The Federal Emergency Management Agency (FEMA) has mapped the 100-year floodplain and floodway along this section of the San Dieguito River on their *Flood Insurance Rate Maps* (FIRMs). The effective FIRMs in the vicinity of the bridge are 06073C1307H and 0673C1309H dated December 20, 2019 (a FIRMette covering the site is included after this report text). The FIRMs show that the floodplain extends broadly across the overbank areas approaching the bridge, while the floodway is mostly contained within the main channel as well as within the existing bridge opening. The floodplain represents the area subject to inundation during a 100-year flood, while the floodway is a regulatory area reserved in order to convey the 100-year flood without increasing its water surface elevation more than a foot. FEMA has performed detailed coastal engineering analyses, which encompasses the coastline along the lagoon mouth.

This report contains hydraulic and scour analyses for the bridge alternatives. The analyses are used to assess the feasibility, freeboard requirements, and scour countermeasures for each alternative. This information will be used to aid in selecting the preferred alternative(s).

HYDRAULIC ANALYSES

Hydraulic analyses of the San Dieguito River were performed for Alternatives 1.1, 2.1, and 9.2 using the US Army Corps of Engineers' HEC-RAS model. Caltrans' December 2017 "Memo to Designers 16-1" (included after this report text) states that a bridge soffit should pass the greater of the 50-year flood plus freeboard or the 100-year flood without freeboard. Section 821.3 of Caltrans' 2019 *Highway Design Manual* (HDM – Sixth Edition) provides similar requirements. The HDM indicates that a bridge should pass a 50-year flood with freeboard sufficient to accommodate the effects of bedload and debris (2 feet of freeboard is often assumed). In addition, the 100-year flood should be conveyed without freeboard. The 100-year flood criteria is required to be met for no sea level rise and for 38 inches of sea level rise. The alternatives have been designed to meet the 50-year flood plus 2-feet of freeboard and both 100-year flood with no freeboard criteria.

Caltrans' 2-feet of freeboard accounts for the effects of bedload and debris (drift). The sediment transport analyses in the next section determined that several feet of scour will occur at the Camino Del Mar bridge, so bedload will not adversely impact the bridge conveyance. The source of debris is from the upstream watershed. Much of the watershed nearest the bridge is developed, so will not generate large debris. On the other hand, mature brush and trees exist in portions of the San Dieguito River and Lagoon floodplain immediately upstream of the site. The lagoon is broad with a mild slope, so these portions will experience low flow velocities. FEMA's analysis determined 100-year flow velocities of around 4 feet per second upstream of Jimmy Durante Boulevard. These low velocities are not likely to remove nor readily transport large vegetation. Large debris can be captured by the upstream railroad and Jimmy Durante Boulevard bridges prior to reaching the Camino Del Mar bridge. Furthermore, the proposed bridge opening width is over 580-feet, the columns will have rounded noses, and the piers will be spaced at least 104-feet apart, so there is low potential for large amounts of debris to be accumulate against the bridge. Therefore, Caltrans' 2-feet of freeboard requirement is appropriate to account for drift passage.

The HEC-RAS one-dimensional model has been used extensively for modeling of the San Dieguito Lagoon near the project site. This includes modeling for the San Dieguito Wetlands Restoration project, FEMA floodplain and floodway mapping, and the San Dieguito River Bridge Replacement, Double Track and Del Mar Fairgrounds Special Events Platform project. This model is also appropriate for the Camino Del Mar bridge project. The effective flow area is primarily one-dimensional. This is evident in Figure 2, which is a view of the San Dieguito River during the February 21, 1980 flood with a peak discharge of approximately 22,000 cfs. The dominant flow path is in the downstream direction, which can be modeled with the one-dimensional HEC-RAS routine. The HEC-RAS input and results are discussed next.

The HEC-RAS cross-sections are delineated on the Hydraulic and Sediment Transport Work Map in the map pocket. The HEC-RAS study reach extends from the Pacific Ocean to nearly 1,000 feet upstream of Jimmy Durante Boulevard. The cross-section locations were selected to adequately represent the hydraulic conditions along the study reach. Kleinfelder provided August 2017 topographic mapping at the project site. The mapping is at a 1-foot contour interval and on NAVD 88. Spot elevations of the channel bed below the water surface are provided just upstream and downstream of the bridge. This data was used to create the cross-sections closest to

the bridge (cross-sections 0.0439, 0.0705, 0.0837, and 0.1027). The remaining cross-sections were obtained from a prior existing condition analysis by Chang Consultants and are on NGVD 29. The prior data was used because it provides elevation information below the water surface that is not reflected on the recent topographic mapping. According to FEMA's April 5, 2016, *Flood Insurance Study, San Diego County, California* (FIS), 2.1 feet is added to NGVD 29 elevations to convert to NAVD 88 (see the excerpt in Appendix A). The remaining cross-sections were increased by 2.1 feet to convert to NAVD 88. Since the project is adjacent to the Pacific Ocean, the river channel contains sandy material, is subject to continuous tidal influences, and undergoes ongoing physical changes. As a result, the actual field conditions will vary from the topographic mapping over time.



Figure 2. February 21, 1980 San Dieguito River Flood

FEMA's 50- and 100-year flow rates were used for the analyses. The 50- and 100-year flow rates are 31,400 and 41,800 cubic feet per second at the bridge, respectively (see Appendix A). The 50- and 100-year starting water surface elevations at the Pacific Ocean were based on the San Dieguito River Flood Profiles from FEMA's recent December 20, 2019 FIS (see the map pocket) and are approximately 9.0 and 10.2 feet, respectively. The Flood Profiles start approximately 90 feet downstream of the Camino Del Mar bridge. The FIRMette indicates that the 100-year Zone AE floodplain elevation is 8 feet at the Pacific Ocean. The higher 100-year elevation of 10.2 feet from the Flood Profiles was chosen in order to generate conservative results in establishing soffit elevations.

A roughness coefficient of 0.025 was assigned to reflect the main river channel, which contains sandy material as well as a base flow. The roughness was increased in the overbank areas to between 0.030 to 0.045 to reflect increased roughness associated with existing improvements, vegetation, or riprap. Encroachments were used to model ineffective flow areas associated with bridge contraction and expansion.

The proposed bridge under each alternative has a longer span than the existing bridge. However, the existing abutments will remain, so the overall flow conveyance width through the proposed condition bridge will be the same as existing conditions. The bridge pier widths and locations as well as the roadway and haunch profiles were modeled based on Kleinfelder's plans. The Alternative 1.1 and 1.2 bridge piers are oblong. The piers will be aligned 20 degrees counterclockwise from a line perpendicular to the bridge centerline in order to more closely follow the flow direction. The superstructure is haunched under Alternative 1.1 and 1.2 with a greater depth at the piers and smaller depth midspan.

The bridge is skewed to the river's flow direction. The FIRMette includes FEMA's flow line that has an approximately 8 degree skew. A better indication of the skew angle is seen in Figure 2. The bridge skew angle from the flow direction is approximately 30 to 40 degrees. The San Dieguito River Bridge Replacement, Double Track and Del Mar Fairgrounds Special Events Platform project proposes to widen the upstream railroad bridge to the north, which will reduce the skew angle. A conservative skew angle of 40 degrees was assumed for the proposed bridge alternatives. In addition, the widths of the oblong piers were increased to account for the greater flow obstruction associated with the skew. Since the Platform project is upstream of Camino Del Mar and the river flow is subcritical, the Platform project will not change water surface elevations at the proposed bridge.

Additional proposed condition analyses for each alternative were requested assuming sea level rises of 38 inches, 66 inches, and 8.8 feet. The starting 50- and 100-year water surface elevations were increased by these amounts. At the higher water surface elevations, the flow is not contained with some cross-sections. Since the results are merely used for a relative comparison and large sea level rise is speculative, the cross-sections were not extended, but can be during final engineering for the preferred alternative, as needed.

The proposed condition 50- and 100-year HEC-RAS results with and without sea level rise are included in Appendix A. The results at the upstream edge of the Camino Del Mar bridge (cross-section 0.0771) are summarized in Table 1. Table 1 also summarizes the minimum required soffit elevations based on the typical Caltrans' criteria of the 50-year flood plus 2 feet of freeboard and the 100-year flood with no freeboard. Caltrans' added that the 100-year flood with 38 inches of sea level rise and no freeboard should be considered. The 50-year plus freeboard criteria results in a higher soffit than both 100-year criteria for all three alternatives. Kleinfelder has designed the bridge soffit of Alternatives 1.1, 2.1, and 9.2 to be above the 50-year flood minimum soffit elevations in Table 1.

Alternative	Flood Event	Sea Level Rise, inches	Water Surface Elevation, feet	Minimum Soffit Elevation, feet[1]
1.1	50-Year	0	12.55	14.55
1.1	50-Year	38	12.76	
1.1	50-Year	66	14.63	
1.1	50-Year	105.6 (8.8')	17.81	
1.1	100-Year	0	14.09	14.09
1.1	100-Year	38	14.14	14.14
1.1	100-Year	66	15.86	
1.1	100-Year	105.6 (8.8')	18.99	
2.1	50-Year	0	12.55	14.55
2.1	50-Year	38	12.76	
2.1	50-Year	66	14.63	
2.1	50-Year	105.6 (8.8')	17.81	
2.1	100-Year	0	14.11	14.11
2.1	100-Year	38	14.15	14.15
2.1	100-Year	66	15.86	
2.1	100-Year	105.6 (8.8')	18.99	
9.2	50-Year	0	12.48	14.48
9.2	50-Year	38	12.75	
9.2	50-Year	66	14.63	
9.2	50-Year	105.6 (8.8')	17.81	
9.2	100-Year	0	14.03	14.03
9.2	100-Year	38	14.11	14.11
9.2	100-Year	66	15.86	
9.2	100-Year	105.6 (8.8')	19.00	

[1]Minimum soffit elevation to be the greater of the 50-year flood plus 2-feet of freeboard, 100-year flood with no freeboard, and 100-year flood with 38-inch of sea level rise and no freeboard. The 50-year flood plus freeboard criteria governs for all three alternatives (elevations in red).

Table 2. HEC-RAS Results at Upstream Edge of Camino Del Mar Bridge (Cross-Section 0.0771)

SEDIMENT TRANSPORT ANALYSES

The HEC-RAS results indicate that the 100-year flow velocities at the proposed bridge range from 7.4 to 14.9 feet per second depending on the alternative and sea level rise, which are considered erosive. Stream bed scour consists of general scour and local scour. General scour is related to the sediment supplied into and transported out of a channel reach. Local scour is due to a local flow obstruction by a bridge pier/bent or abutment. The total scour is the general scour plus the local scour. The total scour should be considered in the design of the proposed bridge.

General Scour

The FLUVIAL-12 model as described in the County of San Diego's September 2014, *Hydraulic Design Manual*, was used to assess the proposed sediment transport trends and general scour. The model was developed by Dr. Howard Chang from Chang Consultants and has been used on dozens of projects in southern California, nationally, and internationally. The following describes the model and its input.

Stream hydraulics, sediment transport, and channel changes may be studied through physical modeling, mathematical modeling, or both. Physical modeling has been relied upon traditionally for stream projects, but mathematical modeling has become popular as this capability expands rapidly. The FLUVIAL-12 program is a mathematical model that has been formulated and developed since 1972 for water and sediment routing in natural and improved streams. The combined effects of flow hydraulics, sediment transport, and stream channel changes are simulated for given flow events and periods.

The model simulates the inter-related changes in channel-bed profile and channel width based upon a streams tendency to seek uniformities in sediment discharge and power expenditure. At each time step, scour and fill in a channel bed are computed based on the spatial variation in sediment discharge along the channel. Channel-bed corrections for scour and fill will reduce the non-uniformity in sediment discharge. Width changes are also made at each time step, resulting in a movement toward uniformity in power expenditure along the channel. Because the energy gradient is a measure of the power expenditure, uniformity in power expenditure also means a uniform energy gradient or linear water surface profile. A river channel may not have a uniform power expenditure or linear water-surface profile, but it is constantly adjusting itself toward that direction. The FLUVIAL-12 model was calibrated using twelve sets of field data. Such calibration studies are listed in the FLUVIAL-12 *User's Manual.* Most of the calibration studies were peer-reviewed.

FLUVIAL-12 is applicable to ephemeral streams as well as streams with long-term, continuous flow. Because dynamic changes have transient behavior, ephemeral streams require more complicated model formulation techniques. Stream impacts simulated by the FLUVIAL-12 model include channel bed scour and fill (degradation and aggradation), width variation, and bed topography changes induced by channel curvature (i.e., bend scour associated with channel curvature). These inter-related changes are coupled at individual time steps over an entire flow event or series of flow events. While the model is applicable for erodible channels, physical constraints such as bank protection or armoring, grade-control structures, bedrock outcroppings, etc. may also be specified. Furthermore, the erodible material limits, bank erodibility, angle of repose, and channel roughness (e.g., channel bed and bank material, vegetation density, etc.) are included. Typical model applications include evaluations of sand and gravel mining, channelization, sediment delivery, etc.

FLUVIAL-12 is an *erodible-boundary* model. An erodible-boundary model is different from an erodible-bed model such as HEC-6, HEC-6T, and the sediment transport module in HEC-RAS in some or all of following ways:

1. An erodible-bed model does not simulate channel width changes. Since channel-bed profile changes are closely related to width changes, these should not be separated.

2. An erodible-bed model assumes uniform channel bed profile changes in the erodible zone, i.e., all cross-section points adjust up and down by an equal amount during aggradation and degradation. Actual bed changes are not uniform and, therefore, may not be accurately simulated by an erodible-bed model.

3. An erodible-bed model does not consider channel curvature. In actuality, bed topography is highly non-uniform in a curved channel, especially during high flow.

4. An erodible zone needs to be specified at cross-sections in an erodible-bed model. The model does not determine the extent of channel erosion. The user has to delineate the erodible portion of the channel bed. On the other hand, the erosion boundary is computed and provided by the FLUVIAL-12 model, and the boundary changes with discharge and time.

5. Sediment inflow into the channel reach needs to be specified for other models. This requires a sediment rating curve, which is typically not available for stream channels. In the FLUVIAL-12 model, the sediment inflow may be specified or it may be computed based on the upstream cross-section flow hydraulics.

6. FLUVIAL-12 has been tested and calibrated with field data from several streams in both semi-arid and humid regions. An erodible-bed model may not be calibrated with field data of natural streams.

For the reasons described above, the FLUVIAL-12 model is appropriate for sediment transport analysis of the San Dieguito River. The following describes the model input and results.

The FLUVIAL-12 model uses cross-sectional data to model the physical shape of a channel similar to HEC-RAS. The cross-sections and roughness coefficients were based on the proposed condition HEC-RAS geometry as well as prior modeling data by Chang Consultants extending upstream of El Camino Real. The model is on NAVD 88. In addition to cross-sectional data, FLUVIAL-12 requires a flow hydrograph, bed material gradations, and an appropriate sediment transport formula.

A flow hydrograph represents the relationship between flow rate (cubic feet per second) versus time (hours) for a given flood event. Sediment transport is directly related to the flow rate, i.e., a higher flow rate can transport more sediment. Caltrans' December 2017 "Memo to Designers 16-1" states that scour should be investigated for the design flood and check flood. The check flood is typically a 200-year event. Since the check flood is greater than the 100-year design flood, the 200-year hydrograph was used in FLUVIAL-12. The 200-year peak flow rate was interpolated from the FEMA 10-, 50, 100-, and 500-year flow rates using a log-probability graph and is

60,000 cfs at the bridge (see Appendix A). Figure 3 illustrates the 200-year hydrograph used for the analysis.

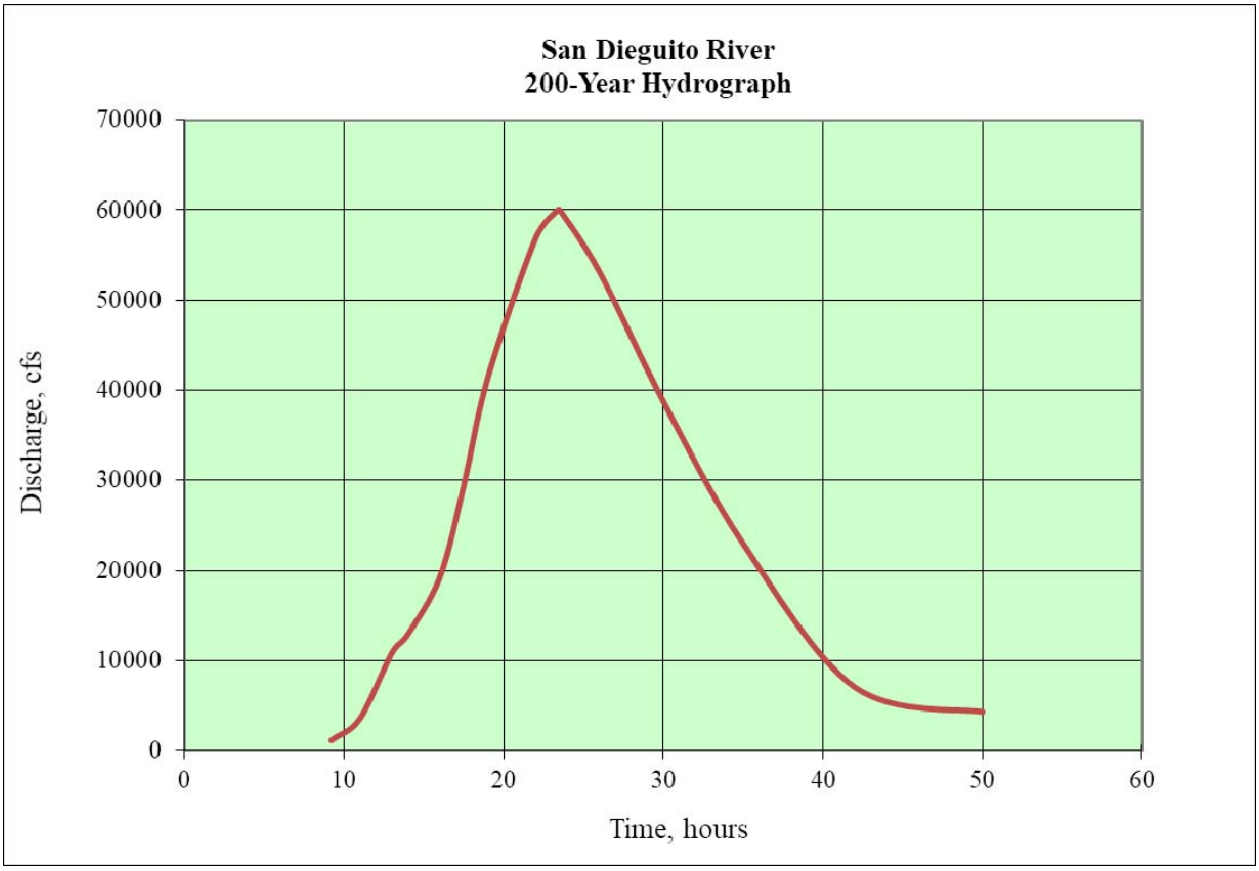


Figure 3. 200-Year Hydrograph

The bed material gradations and Engelund-Hansen sediment transport formula are from prior data used for extensive modeling for the San Dieguito Lagoon Restoration project. Finally, since the San Dieguito River delta extends into the Pacific Ocean, an additional cross-section was added within the ocean and tidal data was entered so that the peak 200-year flow rate corresponds to low tide. This will yield conservative results, i.e., a greater potential for scour.

The FLUVIAL-12 results at the Camino Del Mar bridge are included in Figure 4. The cross-section is looking in the downstream direction. The figure shows general scour predicted during the peak and end of the 200-year flood. The results indicate greater scour during the peak of the event followed by some backfill towards the end of the event. The maximum scour reached over the entire duration of the 200-year flood is also plotted and extends to elevation -14.5 feet NAVD 88. The main channel at the Camino Del Mar bridge can meander over time, so this maximum scour elevation shall be assumed across the entire bridge opening for design purposes.

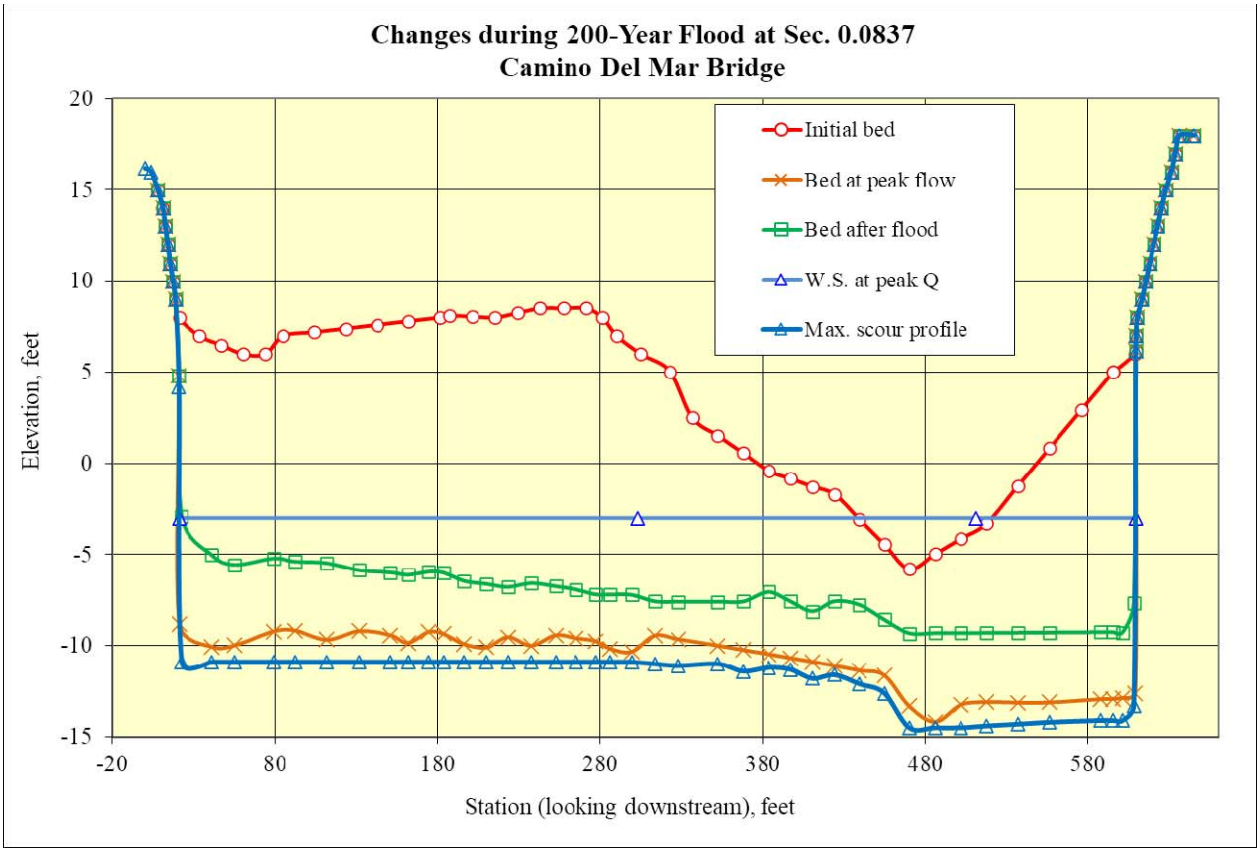


Figure 4. FLUVIAL-12 General Scour Results

Local Scour

Local scour analyses were performed to determine the pier scour, which is associated with accelerated flow and the resulting vortices leading to a removal of material near a bridge pier. Per Caltrans' criteria, the local scour was based on the 200-year flood. Appendix A contains 200-year HEC-RAS hydraulic results at the proposed bridge for Alternatives 1.1, 2.1, and 9.2. The 200-year HEC-RAS analyses use the same assumptions as the 50- and 100-year analyses except the starting water surface elevation estimated from the FEMA Flood Profiles is 12 feet. The Colorado State University (CSU) equation from Hydraulic Engineering Circular No. 18 (HEC-18) is the standard pier scour formula and has the following form:

$$y_s/a = 2.0\ K_1\ K_2\ K_3\ (y_1/a)^{0.35}\ F_r^{0.43}$$

where,

y_s = scour depth, feet
y_1 = flow depth directly upstream of the pier, feet
a = pier width, feet (this is based on the pile casing diameter)
K_1 = correction factor for pier nose shape
K_2 = correction factor for angle of attack of flow
K_3 = correction factor for bed condition
F_r = Froude Number directly upstream of pier

The CSU equation input values are: y_1 = flow depth from the HEC-RAS 200-year results at cross-section 0.0771, a = 7 to 11 feet depending on alternative, K_1 = 1.0 for a round nose or cylindrical piers and 1.1 for square nose piers, K_2 = 1.0 for no angle of attack, K_3 = 1.1 for a plane bed, and F_r = Froude number from the HEC-RAS results at cross-section 0.0771. Table 3 summarizes the pier scour input and results.

Alternative	y_1, ft	a, ft	F_r	y_S, ft
1.1	22.27	11	0.41	21.1
2.1	22.32	10	0.41	19.9
9.2	22.22	7	0.41	15.7

Note: K_1=1.0, K_2 = 1.0, and K_3 = 1.1 for all alternatives.

Table 3. Summary of Pier Scour

Pier scour is most impacted by the pier width and nose shape. Pier scour is directly related to the width, while the nose shape can reduce scour by 10 percent. Therefore, narrower piers with rounded noses will require a lesser design depth. The piers shall be designed for the total scour, which is the sum of the general scour and pier scour.

Local scour can occur around abutments due to the flow obstruction caused when abutments protrude into the active river channel. As mentioned in the Hydraulic Analyses section, the existing abutments will remain. The proposed abutments will be constructed behind the existing abutments. Therefore, the abutment scour will not be altered by the project and the current abutment protection will be maintained.

CONCLUSION

Hydraulic and sediment transport analyses have been performed for the proposed Camino Del Mar bridge over the San Dieguito River/Lagoon. The bridge will replace an existing bridge that has been identified for rehabilitation. Hydraulic analyses have been performed for Kleinfelder's Alternatives 1.1, 2.1, and 9.2. Kleinfelder also prepared plans for Alternatives 2.2 and 9.1, but the hydraulic results for these are represented by the results for Alternatives 9.2 and 2.1, respectively, since the openings and piers are similar. Kleinfelder has designed the superstructure of each alternative to be above Caltrans' minimum required soffit elevations, which are governed by the 50-year flood with 2-feet of freeboard. In addition, the piles will be over 140-feet deep, so will extend well below the predicted local and general scour depths. The existing bridge abutments and abutment protection will remain. Tables 4 and 5 contain Caltrans' Hydrologic Summary Table and Scour Data Table, respectively.

Caltrans emailed tsunami hazard information and design guidelines, which are included after the report text. The guidelines state that a "tsunami can damage a bridge if the waves are high enough to strike the deck." The maximum tsunami wave elevation is given as 10.7 feet NAVD 88 and sea level rise for year 2100 is 3.7 feet. Adding these values yields a tsunami design elevation of 14.4 feet. This elevation is just below the minimum required soffit elevations in Table 1, so the superstructure will avoid tsunami wave strikes. The piers can be subject to local

scour from a tsunami. The maximum flow depth at the piers from a tsunami wave at elevation 14.4 feet is 20.2 feet. Based on a Froude number of 1, the pier scour from the HEC-18 formula is 29.9 feet. As mentioned above, the piles will be over 140-feet deep, so the piers will be protected from the tsunami-induced pier scour. The maximum tsunami flow velocity is listed as 3 meters per second (9.8 feet per second). This velocity is lower than the 100-year flow velocities, so riprap used to protect the abutments will be capable of resisting the tsunami forces.

Hydrologic Summary for Bridge No. 57C-0209 (Camino Del Mar)			
Drainage Area = 346 square miles			
Frequency	**Design Flood**	**Base Flood**	**Flood of Record**
	50-Year	100-Year	Unknown. Ungaged.
Discharge	31,400 cfs	41,800 cfs	N/A
Water Surface Elevation at Bridge	Alt 1.1 = 12.55 feet Alt 2.1 = 12.55 feet Alt 9.2 = 12.48 feet	Alt 1.1 = 14.09 feet Alt 2.1 = 14.11 feet Alt 9.2 = 14.03 feet	N/A

Table 4. Hydrologic Summary Table

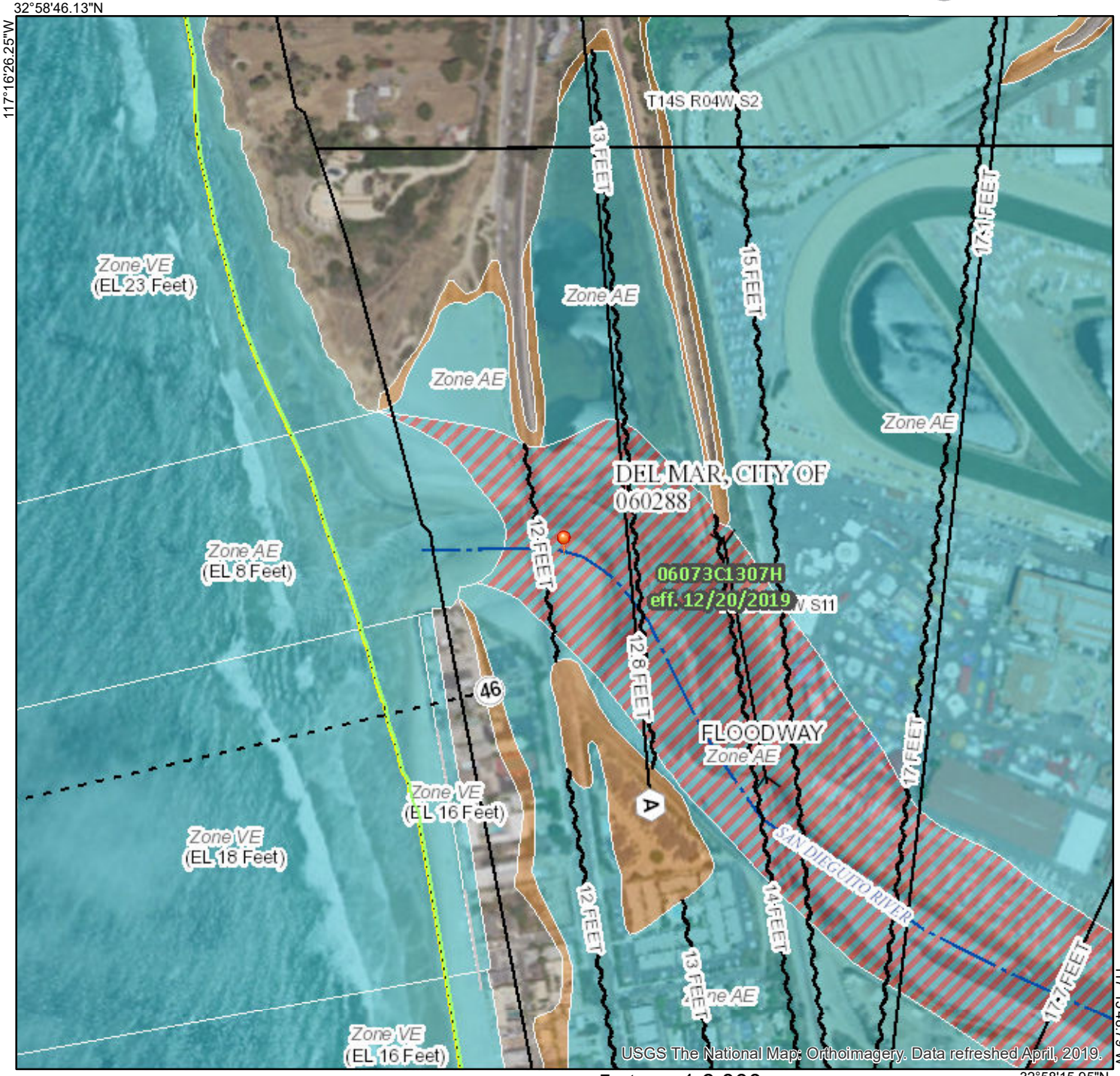
Support No.	**Long Term (Degradation and Contraction) Scour Elevation, feet NAVD 88**	**Short Term (Local) Scour Depth, feet**
Abutment 1 (South)	-14.5	0
Alternative 1.1 Piers	-14.5	21.1
Alternative 2.1 Piers	-14.5	19.9
Alternative 9.2 Piers	-14.5	15.7
Abutment 4 (North)	-14.5	Per existing.

Table 5. Scour Data Table

Since the proposed bridge will encroach into the FEMA floodplain and floodway, FEMA's no-rise criteria will be met. The existing abutments will remain, so the overall opening width will not change. The existing bridge contains ten piers whose widths vary from 4-feet along the lower portion to 6-feet near the deck. The proposed alternatives will contain between 4 to 5 piers. The total width of the proposed piers will be less than the existing piers. In addition, the proposed soffit will be raised. Therefore, each of the proposed alternatives will provide greater flow conveyance and a no-rise will be achieved.

National Flood Hazard Layer FIRMette

FEMA



Feet

0 250 500 1,000 1,500 2,000

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/3/2020 at 12:46:17 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

16-1 HYDRAULIC DESIGN FOR STRUCTURES OVER WATERWAYS

Introduction

This memorandum provides direction for the hydraulic design of structures over waterways on the State Highway System (SHS). The intent is to assist the structure designer in understanding the recommendations provided in the Bridge Hydraulics Reports.

The hydraulic design of a bridge must include the scour condition. Generally, scour is increased with high flow velocities in the waterway. Other factors such as turbulence, complex flow patterns around the abutments, or a bridge location on a bend in the stream can contribute to the scour condition. The hydraulic design of the bridge should aim to accommodate waterway conveyance with the least amount of impact to velocities and water surface levels.

Policy Statement

Structures over waterways on the SHS shall be designed in accordance with the AASHTO LRFD Bridge Design Specifications, current California Amendments (AASHTO LRFD-BDS-CA) and the Highway Design Manual (HDM). Design Flood is defined in the Highway Design Manual (HDM 818.1) as:

Design Flood - The peak discharge (when appropriate, the volume, stage, or wave crest elevation) of the flood associated with the probability of exceedance selected for the design of a highway encroachment.

Design flood frequencies adopted as a standard for design and their application are listed below:

- 50-year or 100-year flood used for adequate waterway conveyance OR as specified by any flood control agency.
- 100-year flood used for scour analysis.
- Minimum of 200-year flood or a maximum of 500-year flood used for check flood.

The general criteria for setting the soffit elevation is to pass the greater of (1) Design Flood (typically Q50 + freeboard), or (2) Base Flood (Q100 without freeboard). Per HDM 818.2 & 821.3, design practice recommends that a range of peak flows be considered and that the Design Flood be established which best satisfies the specific site conditions and associated risks. There will be rare situations where the risks of a lower water crossing is acceptable, but

typically the highways shall not be inundated by the Design Flood. At low water crossings subject to inundation as an accepted risk, the overtopping flood will be used as the Design Flood. Deviation from the standard design criteria requires project-specific design criteria to be included in the hydraulic reports.

In accordance with the Local Assistance Procedures Manual (LAPM), Chapter 11, local-agency-funded projects with bridges on the SHS must be designed in accordance with current SHS standards outlined in the Caltrans bridge design manuals and the HDM. All local bridge and structure projects off the SHS and either on or off the National Highway System (NHS) must use similar design criteria. For all state or local bridges, the effects of objectionable backwater conditions must be considered.

Certain regions throughout the state are regulated by local flood control agencies and bridge structures within their jurisdiction must satisfy their design requirements. Certain local agencies have established higher design standards than Caltrans requires. Local agencies that choose to require higher standards of design may complicate the ability to receive federal funding. There may be circumstances where the risks of a lower water crossing are acceptable. The hydraulic studies must provide justification for deviating from the standard design criteria.

The AASHTO LRFD-BDS requires scour at bridge foundations to be investigated for two conditions: (1) design flood and (2) check flood. Scour for the design flood is based on the 100-year event or from an overtopping flood of a lesser recurrence interval. Scour for the check flood is based on a higher flood discharge; typically a 200-year event.

For all capital projects, a hydraulic study report is required for any bridge over a waterway to address adverse flood risk potential. Environmental approvals often hinge on compliance with local flood control agencies or other regulatory agencies. The hydraulic study reports must comply with the requirements set forth in this document. Reports may not be necessary for structure maintenance projects.

Scour of Geologic Material

The geologic material underlying a waterway may be either: (1) granular or fine material, (2) cohesive or non-cohesive, (3) erodible or non-erodible rock. Various geologic materials erode at different rates. Non-cohesive materials scour more readily than cohesive materials, while cohesive or cemented soils typically are less scour-resistant than some rocks. The geotechnical analysis studies the in-situ soil properties and the hydraulic conditions of the flow to determine the erosional susceptibility of the foundation material during a single flood event or long-term erosion.

The geologic properties and hydraulic conditions of water flow may vary during the life of the bridge. The geologic and soil factors include the sediment or rock type, its porosity and

basins having areas in excess of 320 acres than for small basins.

821.3 Selection of Design Flood

As discussed in Index 818.2, there are two recognized alternatives to selecting the design flood frequency (probability of exceedance) in the hydraulic design of bridges and culverts. They are:

- By policy - using a preselected recurrence interval.
- By analysis - using the recurrence interval that is most cost effective and best satisfies the specific site conditions and associated risks.

Although either of these alternatives may be used exclusive of the other, in actual practice both alternatives are often considered and used jointly to select the flood frequency for hydraulic design. For culverts and bridges, apply the following general rules for first consideration in the process for ultimate selection of the design flood.

(1) Bridges. The basic rule for the hydraulic design of bridges (but not including those culvert structures that meet the definition of a bridge) is that they should pass a 2 percent probability flood (50-year). Freeboard, vertical clearance between the lowest structural member and the water surface elevation of the design flood, sufficient to accommodate the effects of bedload and debris should be provided. Alternatively, a waterway area sufficient to pass the 1 percent probability flood without freeboard should be provided. Two feet of freeboard is often assumed for preliminary bridge designs. The effects of bedload and debris should be considered in the design of the bridge waterway.

(2) Culverts. There are two primary design frequencies that should be considered:

- A 10% probability flood (10-year) without causing the headwater elevation to rise above the inlet top of the culvert and,
- A 1% probability flood (100-year) with-out headwaters rising above an elevation that would cause objectionable backwater depths or outlet velocities.

The designer must use discretion in applying the above criteria. Design floods selected on this basis may not be the most appropriate for specific project site locations or conditions. The cost of providing facilities to pass peak discharges suggested by these criteria need to be balanced against potential damage to the highway and adjacent properties upstream and downstream of the site. The selection of a design flood with a lesser or greater peak discharge may be warranted and justified by economic analysis. A more frequent design flood than a 4% probability of exceedance (25-year) should not be used for the hydraulic design of culverts under freeways and other highways of major importance. Alternatively, where predictive data is limited, or where the risks associated with drainage facility failure are high, the greatest flood of record or other suitably large event should be evaluated by the designer.

When channels or drainage facilities under the jurisdiction of local flood control agencies or Corps of Engineers are involved, the design flood must be determined through negotiations with the agencies involved.

821.4 Headwater and Tailwater

(1) Headwater. The term, headwater, refers to the depth of the upstream water surface measured from the invert of the culvert entrance. Any culvert which constricts the natural stream flow will cause a rise in the upstream water surface.

It is not always economical or practical to utilize all the available head. This applies particularly to situations where debris must pass through the culvert, where a headwater pool cannot be tolerated, or where the natural gradient is steep and high outlet velocities are objectionable.

The available head may be limited by the fill height, damage to the highway facility, or the effects of ponding on upstream property. The extent of ponding should be brought to the attention of all interested functions, including Project Development, Maintenance, and Right of Way.

Full use of available head may develop some vortex related problems and also develop

Wayne W. Chang

Subject: FW: EXTERNAL: ACTION: BHLO 5356(008) - Camino Del Mar (57C-0209), Caltrans DES Tsunami Hazard information

From: Thiele, Tim <TTHIELE@mbakerintl.com>
Sent: Thursday, April 30, 2020 3:14 PM
To: Don Bloodworth <DBloodworth@kleinfelder.com>; Nganha Vu <NVu@kleinfelder.com>; Jim Frost <JFrost@kleinfelder.com>
Subject: RE: EXTERNAL: ACTION: BHLO 5356(008) - Camino Del Mar (57C-0209), Caltrans DES Tsunami Hazard information

External Email.

Is this what you were looking for?

From: Pham, Anh-Vu D@DOT <anh-vu.pham@dot.ca.gov>
Sent: Thursday, April 30, 2020 1:16 PM
To: Don Bloodworth <DBloodworth@kleinfelder.com>; Thiele, Tim <TTHIELE@mbakerintl.com>; Mohsen Maali <mmaali@delmar.ca.us>; Nganha Vu <NVu@kleinfelder.com>; Jim Frost <JFrost@kleinfelder.com>
Subject: EXTERNAL: ACTION: BHLO 5356(008) - Camino Del Mar (57C-0209), Caltrans DES Tsunami Hazard information

Hi, Mohsen and City Team

Based on the City's consultant recent request for Tsunami Hazard information from Caltrans for the above subject bridge (attached), the Division of Engineering Services (DES)- Structures Local Assistance (SLA) requested Tsunami Hazard information from DES- Office of Earthquake Engineering (OEE).

The following project-specific Tsunami Hazard information for the City's bridge replacement project was provided by DES-OEE:

Br #57C0209 32.9754, -117.2690
Max wave elevation (ft): 6.3 ft MHW
8.2 ft MSL
10.7 ft NAVD88
Max flow velocity: 3 m/s.
Sea Level Rise: 3.7 feet for year 2100

SLA notes and recommendations:

1. Please note that the Sea Level Rise (SLR) value provided (above) by Caltrans DES is applicable to Tsunami Hazard. The design SLR value proposed for flood waterway conveyance and/or project permitting may differ but should be documented clearly in proposed project-specific design criteria. Proposed project-specific bridge design criteria is subject to both HBP eligibility and SLA technical concurrence reviews.

2. Based on SLA's prior coordination with DES-OEE several months ago, DES-OEE has prioritized their preparation of a draft Structure Technical Policy (STP) related to Tsunami Hazard, however, a companion draft Structure Technical Guidelines (STG) has not been developed yet. Below is a short excerpt of the current draft Tsunami STP under development, where further Caltrans revisions might occur until finally adopted/approved, as there are some differences with the current MTD 20-13. The City/consultant may utilize the draft STP excerpt at their

own risk, and as such, please do not share OEE's draft STP 20.13 excerpt with others not involved on the City's project.

3. SLA recommends that the City's consultant should initially evaluate whether the proposed Design Tsunami wave would impact or be below the proposed bridge superstructure(s) under draft type selection consideration, and notify Caltrans District 11 Local Assistance of the results for follow-up technical discussions with SLA, if warranted.

Also, please consider the following:

DRAFT STP 20.13 excerpt follows

20.13 TSUNAMI LOADS FOR BRIDGES (DRAFT)

20.13.1 GENERAL

Caltrans requires that the design of all new bridges within five miles of the coast (and in bays) must include an evaluation for tsunami loads. Caltrans evaluates bridges for the tsunami hazard consistent with a 5% probability of being exceeded in 50 years.

A tsunami can damage a bridge if the waves are high enough to strike the deck. However, the design tsunami at most locations along California's coast should be below the superstructure. Therefore, wherever possible, new bridges should be designed so the tsunami flows below the soffit (or bottom girder flange). If this is not possible the bridge should be designed for ground shaking hazards and checked to ensure that the bridge can resist the tsunami loads as described in Section 20.13.4.

The critical demand parameters (described below and in Figure 20.13.1.1) can be obtained from Caltrans Office of Structure Hydraulics and Hydrology (or from the liaison engineer for consultant-designed projects)

Tsunami flow velocity, μ.

Tsunami Flow Depth, η **= wave elevation – ground elevation (in feet). Sea Level**

Rise, δ.

Scour Depth, y_s.

The policies presented here are based on Caltrans-funded research (Azadbakht, 2015),

on the work by the Pooled Fund Tsunami Project (AASHTO, 2020), on wave flume experiments (Hoshikuma, 2013) and (Istrati, 2016), and from Computational Fluid Dynamic Analyses (Amini, 2019). The results of these studies are the simplified tsunami loading equations discussed in Section 20.13.4 of this document.

It is preferable for new bridges along the coast to be monolithically-constructed with continuous superstructures. Existing bridges along the coast often have superstructures supported on drop bent caps and bearings. For these bridges, the tsunami loads must be resisted by shear keys, cross-bracing, restrainers, and/or special bearings. When the space between the girders can trap air that increases superstructure buoyancy, the analysis should determine if the girders can be picked up and removed by the tsunami. Vents can be designed in the bridge deck to allow air to escape and reduce superstructure buoyancy during the tsunami (AASHTO, 2020). Once the superstructure and its connections on existing bridges are determined to be adequate, the load will be carried to the substructure, which must meet the performance standards for new and existing bridges as described in Section 20.13.4).

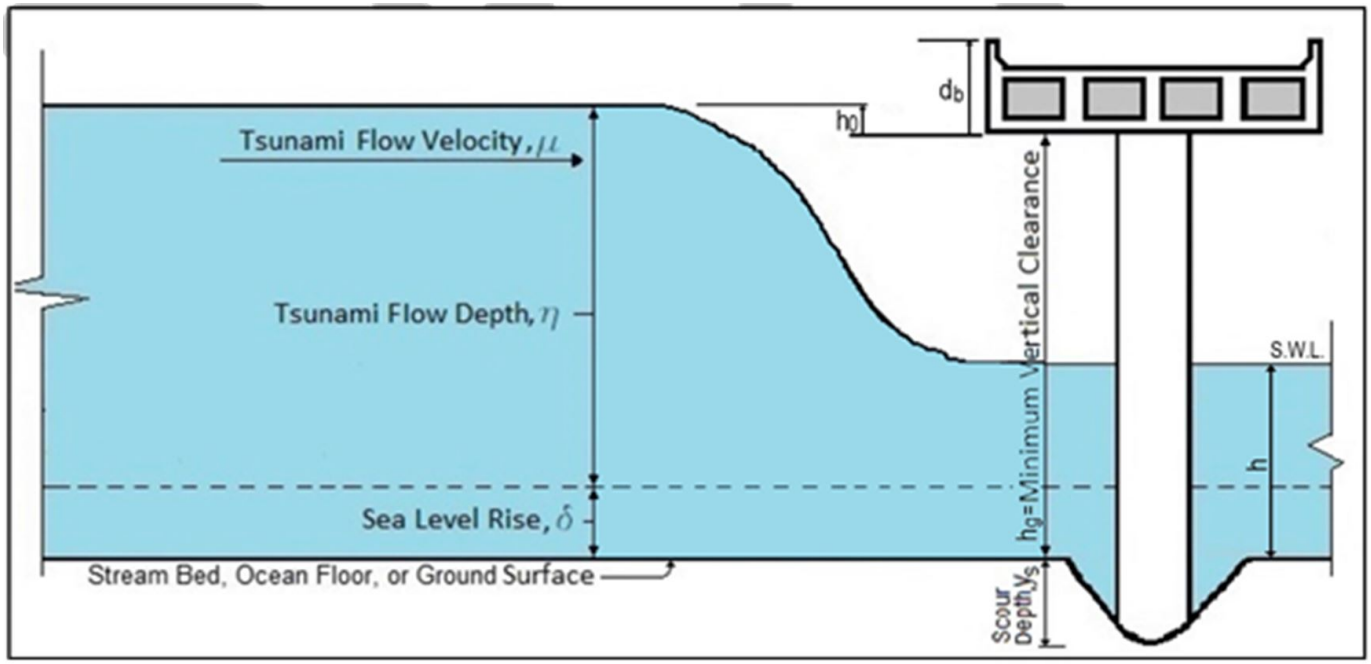
Scour of bridge foundations must be considered for the Design Tsunami (see Section 20.13.5). Approach embankments may also experience substantial erosion and undermining by scour that could severely impact the function of the bridge unless protective measures are included in the embankment design.

These guidelines apply to both state and local-agency owned new and existing bridges. Regional emergency response plans should consider the expected performance of bridges under tsunami loading. This document along with the **Structural Technical Guidelines 20.13** can be used to develop and assess mitigation alternatives.

20.13.2 DEFINITIONS

Design Tsunami: Design tsunami hazards with 5% probability of occurring in 50 years. **Tsunami:** A series of waves usually created by a vertical fault offset on the ocean floor. **Tsunami Flow Depth,** η = (wave elevation – ground elevation at the bridge site).

Tsunami Flow Velocity, μ = tsunami flow velocity at the bridge site.



Thank you,

Anh-Vu Pham
California Department of Transportation
Local Programs Engineer
D11 – Planning & Local Assistance (MS 244)
(858) 436-6072 (Temp. TeleCommute Cell ONLY, COVID-19)
(619) 220-5406 (office)
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BLOG

Caltrans Mission: *Provide a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability.*
Caltrans Vision: *A performance-driven, transparent, and accountable organization that values its people, resources and partners, and meets new challenges through leadership, innovation, and teamwork.*

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APPENDIX A

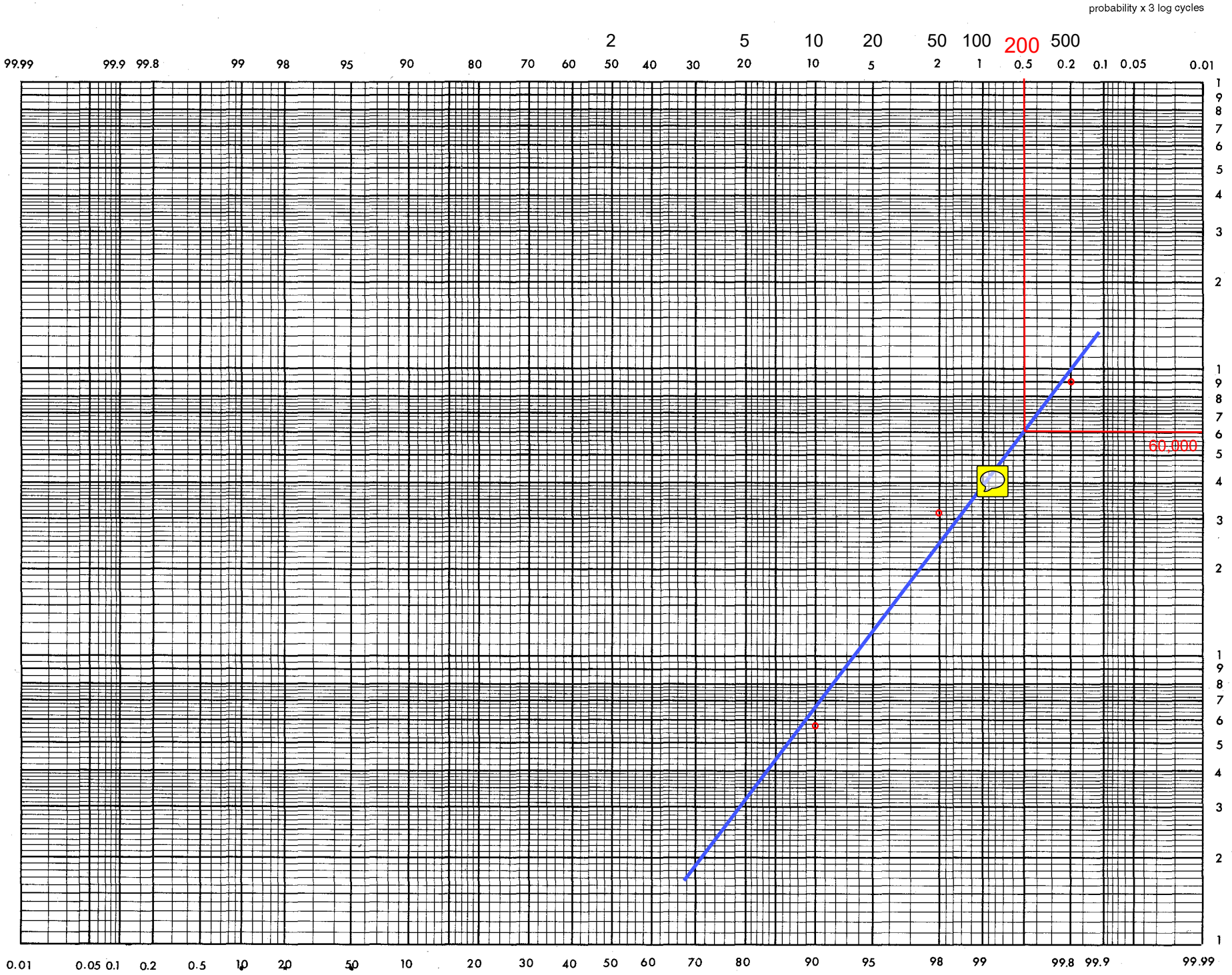
PROPOSED CONDITION
HYDRAULIC DATA
AND
HEC-RAS ANALYSES

TABLE 12: FLOODING SOURCE DATUM SHIFT VALUES

Stream Name	Elevation (feet NAVD above NGVD)
Moosa Creek (North Branch)	+2.3
Moosa Creek (South Branch)	+2.3
Murphy Canyon Creek	+2.1
Murray Canyon Creek	+2.1
Nestor Creek	+2.1
North Avenue Tributary	+2.3
North Branch Poway Creek	+2.1
North Tributary to Santa Maria Creek	+2.2
Olive Creek	+2.4
Otay River	+2.2
Pala Mesa Creek	+2.2
Paradise Creek	+2.1
Paradise Creek – Valley Road Branch	+2.1
Pilgrim Creek	+2.3
Poggi Canyon Creek	+2.2
Pomerado Creek	+2.1
Poway Creek	+2.1
Rainbow Creek (Main Branch)	+2.3
Rainbow Creek (West Branch)	+2.3
Rattlesnake Creek	+2.1
Rattlesnake Creek Split Flow at Heritage Hills	+2.1
Rattlesnake Creek Split Flow at Midland Road	+2.1
Reidy Creek	+2.3
Reidy Creek Split Flow	+2.3
Rice Canyon Creek	+2.1
Rincon Avenue Tributary	+2.3
Rose Canyon Creek	+2.1
Samagutuma Creek	+2.4
San Clemente Canyon Creek	+2.1
San Diego Bay	+2.2
San Diego River	+2.1
San Dieguito River	+2.1
San Elijo Creek	+2.2
San Luis Rey River	+2.3
San Marcos Creek	+2.3
San Marcos Creek (Below Lake San Marcos)	+2.3
San Marcos Creek Highway 78 Split Flow	+2.3

Table 10: Summary of Discharges, continued

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
San Diego River	Just Downstream of Confluence of San Vicente Creek	290.0	2,500	*	*	31,000	*
San Dieguito River	Upstream of Camino Del Mar Bridge	*	5,700	*	31,400	41,800	90,000
San Dieguito River	Upstream of Atchison, Topeka & Santa Fe Railway Bridge	*	5,700	*	31,400	41,800	90,000
San Dieguito River	Upstream of Jimmy Durante Bridge	*	5,800	*	32,100	42,400	90,000
San Dieguito River	Upstream of U.S. Interstate Highway 5 Bridge	*	5,900	*	32,500	42,800	90,000
San Elijo Creek	0.1 Mile Upstream of El Camino Road	5.4	500	*	1,600	2,100	5,500
San Luis Rey River	At Mouth	560.0	6,600	*	31,000	51,000	120,000
San Luis Rey River	Downstream of Confluence with Moosa Canyon	355.6	6,200	*	30,000	48,000	110,000
San Luis Rey River	Downstream of Confluence with Keys Canyon	252.3	5,000	*	25,000	41,000	98,000
San Luis Rey River	Upstream of Confluence with Keys Canyon	180.4	4,000[5]	*	20,000	33,000	85,000


probability x 3 log cycles
2
5
10
20
50
100
200
500
99.99
99.9
99.8
99
98
95
90
80
70
60
50
40
30
20
10
5
2
1
0.5
0.2
0.1
0.05
0.01
60,000

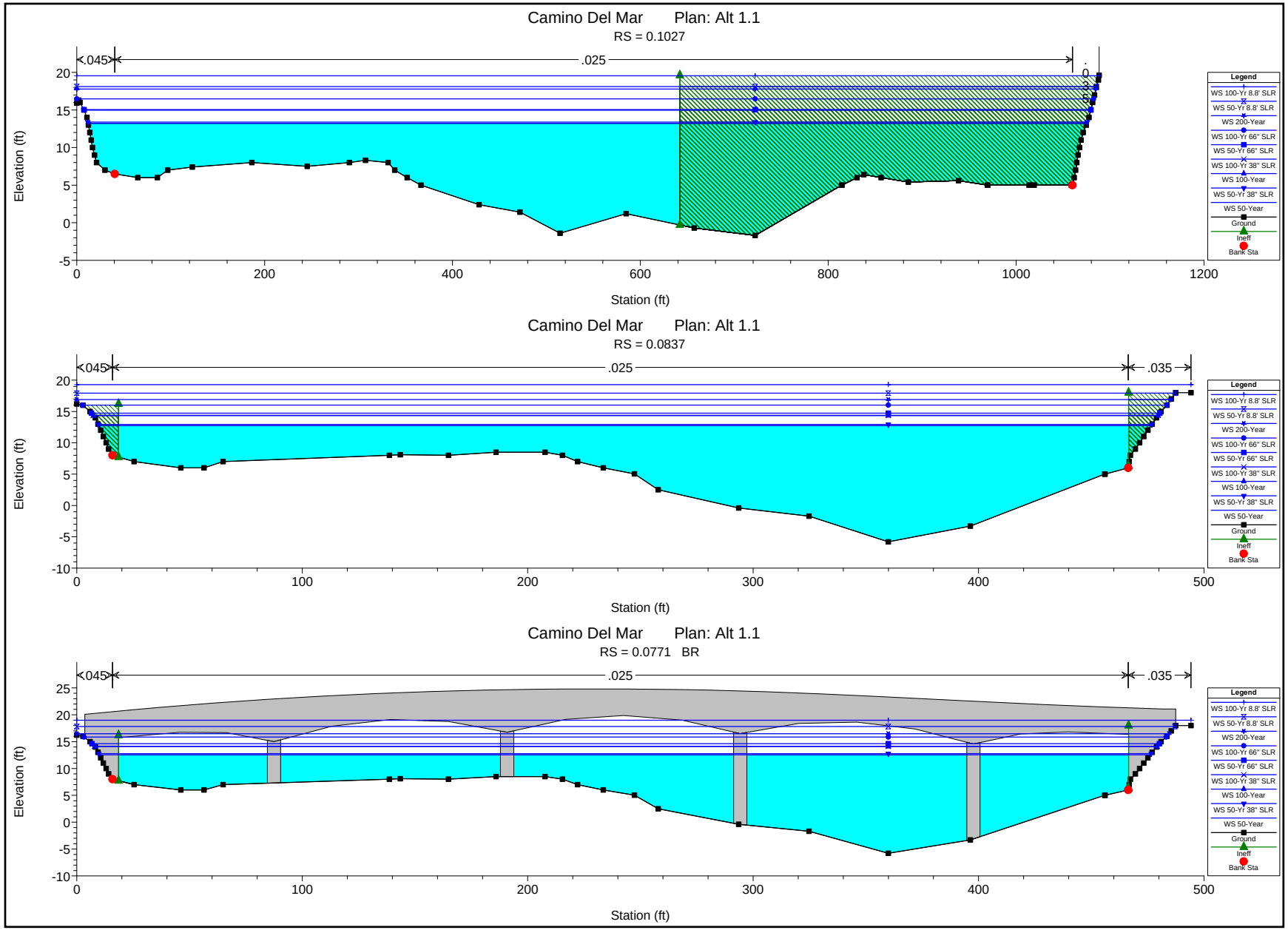
Alternative 1.1 Bridge Results

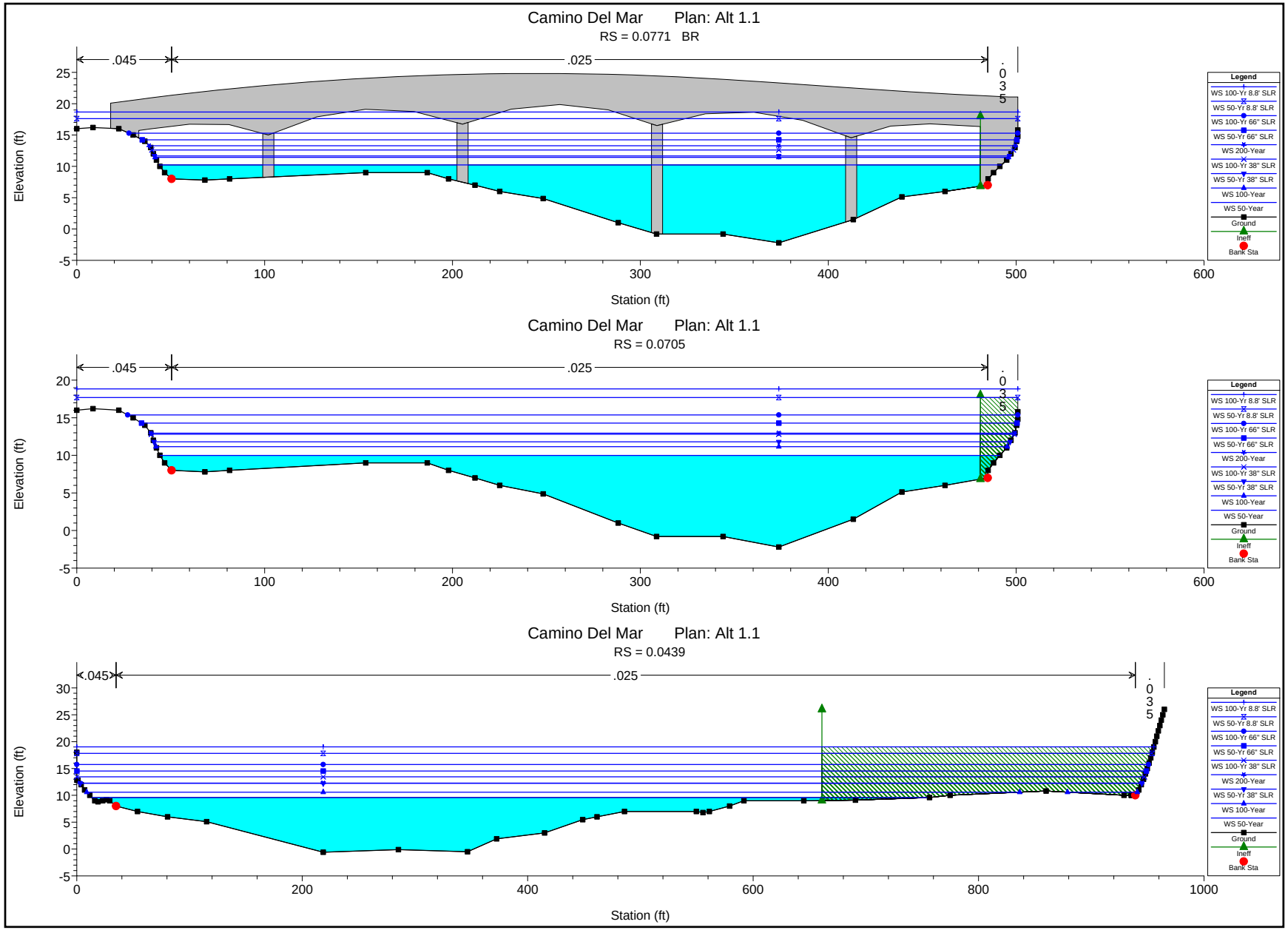
HEC-RAS Plan: Alt 1.1 River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Reach-1	0.1027	50-Year	13.75	13.21		0.06	0.07	1063.22	322.13	31077.87		5.94
Reach-1	0.1027	100-Year	15.64	14.97		0.06	0.10	1071.63	483.23	41316.77		6.57
Reach-1	0.1027	50-Yr 38" SLR	13.91	13.39		0.06	0.07	1064.02	327.53	31072.47		5.82
Reach-1	0.1027	100-Yr 38" SLR	15.67	15.01		0.06	0.09	1071.84	484.08	41315.92		6.54
Reach-1	0.1027	50-Yr 66" SLR	15.41	15.04		0.03	0.05	1072.04	363.99	31036.01		4.90
Reach-1	0.1027	100-Yr 66" SLR	16.99	16.48		0.04	0.07	1082.39	500.33	41299.67		5.74
Reach-1	0.1027	50-Yr 8.8' SLR	18.33	18.11		0.01	0.03	1085.58	435.61	30964.39		3.79
Reach-1	0.1027	100-Yr 8.8' SLR	19.87	19.55		0.02	0.04	1088.32	634.42	41165.58		4.55
Reach-1	0.1027	200-Year	18.62	17.77		0.06	0.13	1084.89	811.25	59188.76		7.42
Reach-1	0.0837	50-Year	13.62	12.74	8.79	0.01	0.03	466.78		31398.37	1.63	7.55
Reach-1	0.0837	100-Year	15.48	14.34	9.92	0.01	0.04	472.20		41797.61	2.39	8.57
Reach-1	0.0837	50-Yr 38" SLR	13.79	12.94	8.79	0.01	0.03	467.40		31398.34	1.66	7.39
Reach-1	0.0837	100-Yr 38" SLR	15.52	14.38	9.92	0.01	0.04	472.40		41797.60	2.40	8.53
Reach-1	0.0837	50-Yr 66" SLR	15.33	14.74	8.79	0.01	0.02	473.94		31398.17	1.83	6.21
Reach-1	0.0837	100-Yr 66" SLR	16.88	16.02	9.92	0.01	0.03	481.14		41797.43	2.57	7.42
Reach-1	0.0837	50-Yr 8.8' SLR	18.29	17.93	8.79	0.00	0.02	487.33	81.35	31316.61	2.04	4.81
Reach-1	0.0837	100-Yr 8.8' SLR	19.81	19.29	9.92	0.00	0.05	494.24	135.10	41405.93	258.97	5.81
Reach-1	0.0837	200-Year	18.43	16.91	11.68	0.01	0.07	485.30	121.15	59875.07	3.78	9.89
Reach-1	0.0771 BR U	50-Year	13.58	12.55	9.01	0.16	0.36	424.41		31399.77	0.23	8.15
Reach-1	0.0771 BR U	100-Year	15.43	14.09	10.17	0.17	0.42	424.41		41799.70	0.30	9.27
Reach-1	0.0771 BR U	50-Yr 38" SLR	13.75	12.76	9.01	0.12	0.16	424.41		31399.77	0.23	7.96
Reach-1	0.0771 BR U	100-Yr 38" SLR	15.47	14.14	10.17	0.14	0.23	424.41		41799.70	0.30	9.23
Reach-1	0.0771 BR U	50-Yr 66" SLR	15.31	14.63	9.01	0.06	0.06	424.41		31397.78	2.22	6.63
Reach-1	0.0771 BR U	100-Yr 66" SLR	16.84	15.86	10.17	0.08	0.08	388.12		41796.70	3.30	7.97
Reach-1	0.0771 BR U	50-Yr 8.8' SLR	18.27	17.81	9.01	0.04	0.02	196.50	4.50	31395.25	0.25	5.42
Reach-1	0.0771 BR U	100-Yr 8.8' SLR	19.76	18.99	10.17	0.09	0.04	74.83	12.36	41779.31	8.33	7.02
Reach-1	0.0771 BR U	200-Year	18.34	16.47	12.01	0.21	0.50	339.81	1.04	59998.51	0.45	10.98
Reach-1	0.0771 BR D	50-Year	13.06	10.22	10.22	0.06	0.04	413.54	23.51	31376.49		13.52
Reach-1	0.0771 BR D	100-Year	14.85	11.43	11.43	0.05	0.05	415.69	66.54	41733.46		14.84
Reach-1	0.0771 BR D	50-Yr 38" SLR	13.47	11.66	10.22	0.02	0.10	416.09	55.53	31344.47		10.78
Reach-1	0.0771 BR D	100-Yr 38" SLR	15.09	12.61	11.43	0.03	0.15	417.47	104.49	41695.51		12.67
Reach-1	0.0771 BR D	50-Yr 66" SLR	15.20	14.23	10.22	0.01	0.05	422.55	110.69	31289.31		7.92
Reach-1	0.0771 BR D	100-Yr 66" SLR	16.68	15.29	11.43	0.01	0.07	414.75	192.89	41607.11		9.50
Reach-1	0.0771 BR D	50-Yr 8.8' SLR	18.20	17.62	10.22	0.00	0.04	225.56	152.90	31247.10		6.11
Reach-1	0.0771 BR D	100-Yr 8.8' SLR	19.63	18.68	11.43	0.01	0.12	114.10	263.82	41536.18		7.86
Reach-1	0.0771 BR D	200-Year	17.64	13.29	13.29	0.05	0.06	418.92	178.52	59821.48		16.75

HEC-RAS Plan: Alt 1.1 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Reach-1	0.0705	50-Year	12.72	9.99	9.99	0.45	0.57	447.01	16.47	31383.53		13.27
Reach-1	0.0705	100-Year	14.45	11.14	11.14	0.44	0.66	453.13	49.59	41750.40		14.58
Reach-1	0.0705	50-Yr 38" SLR	13.34	11.80	9.99	0.14	0.38	455.69	49.86	31350.14		9.97
Reach-1	0.0705	100-Yr 38" SLR	14.91	12.81	11.14	0.16	0.53	459.34	93.36	41706.64		11.65
Reach-1	0.0705	50-Yr 66" SLR	15.14	14.29	9.99	0.06	0.20	466.03	92.15	31307.85		7.43
Reach-1	0.0705	100-Yr 66" SLR	16.60	15.38	11.14	0.07	0.29	473.81	146.17	41653.83		8.89
Reach-1	0.0705	50-Yr 8.8' SLR	18.15	17.68	9.99	0.02	0.11	500.91	201.47	31198.53		5.49
Reach-1	0.0705	100-Yr 8.8' SLR	19.51	18.84	11.14	0.03	0.15	500.91	369.44	41088.59	341.97	6.60
Reach-1	0.0705	200-Year	17.14	12.95	12.95	0.41	0.83	459.84	139.35	59860.64		16.45
Reach-1	0.0439	50-Year	10.90	9.58		0.37	0.06	740.82	18.77	31381.23		9.20
Reach-1	0.0439	100-Year	12.24	10.58		0.34	0.02	889.63	82.10	41717.90		10.33
Reach-1	0.0439	50-Yr 38" SLR	12.82	12.23		0.08	0.02	941.73	141.59	31258.41		6.17
Reach-1	0.0439	100-Yr 38" SLR	14.23	13.44		0.09	0.02	946.98	265.32	41534.68		7.12
Reach-1	0.0439	50-Yr 66" SLR	14.88	14.53		0.03	0.01	948.84	250.15	31149.85		4.78
Reach-1	0.0439	100-Yr 66" SLR	16.24	15.74		0.04	0.02	950.84	395.62	41404.38		5.70
Reach-1	0.0439	50-Yr 8.8' SLR	18.02	17.82		0.01	0.01	953.85	358.34	31041.66		3.62
Reach-1	0.0439	100-Yr 8.8' SLR	19.33	19.03		0.02	0.01	955.50	512.86	41287.14		4.43
Reach-1	0.0439	200-Year	14.40	12.29		0.29	0.02	942.05	275.63	59724.37		11.70


Camino Del Mar Plan: Alt 1.1
RS = 0.1027
.045
.025
.0
Elevation (ft)
Station (ft)
Legend
WS 100-Yr 8.8' SLR
WS 50-Yr 8.8' SLR
WS 200-Year
WS 100-Yr 66" SLR
WS 50-Yr 66" SLR
WS 100-Yr 38" SLR
WS 100-Year
WS 50-Yr 38" SLR
WS 50-Year
Ground
Ineff
Bank Sta
Camino Del Mar Plan: Alt 1.1
RS = 0.0837
.045
.025
.035
Elevation (ft)
Station (ft)
Camino Del Mar Plan: Alt 1.1
RS = 0.0771 BR
.045
.025
.035
Elevation (ft)
Station (ft)


Camino Del Mar Plan: Alt 1.1
RS = 0.0771 BR
.045
.025
.035
Elevation (ft)
Station (ft)
Legend
WS 100-Yr 8.8' SLR
WS 50-Yr 8.8' SLR
WS 100-Yr 66" SLR
WS 50-Yr 66" SLR
WS 200-Year
WS 100-Yr 38" SLR
WS 50-Yr 38" SLR
WS 100-Year
WS 50-Year
Ground
Ineff
Bank Sta
Camino Del Mar Plan: Alt 1.1
RS = 0.0705
.045
.025
.035
Elevation (ft)
Station (ft)
Camino Del Mar Plan: Alt 1.1
RS = 0.0439
.045
.025
.035
Elevation (ft)
Station (ft)

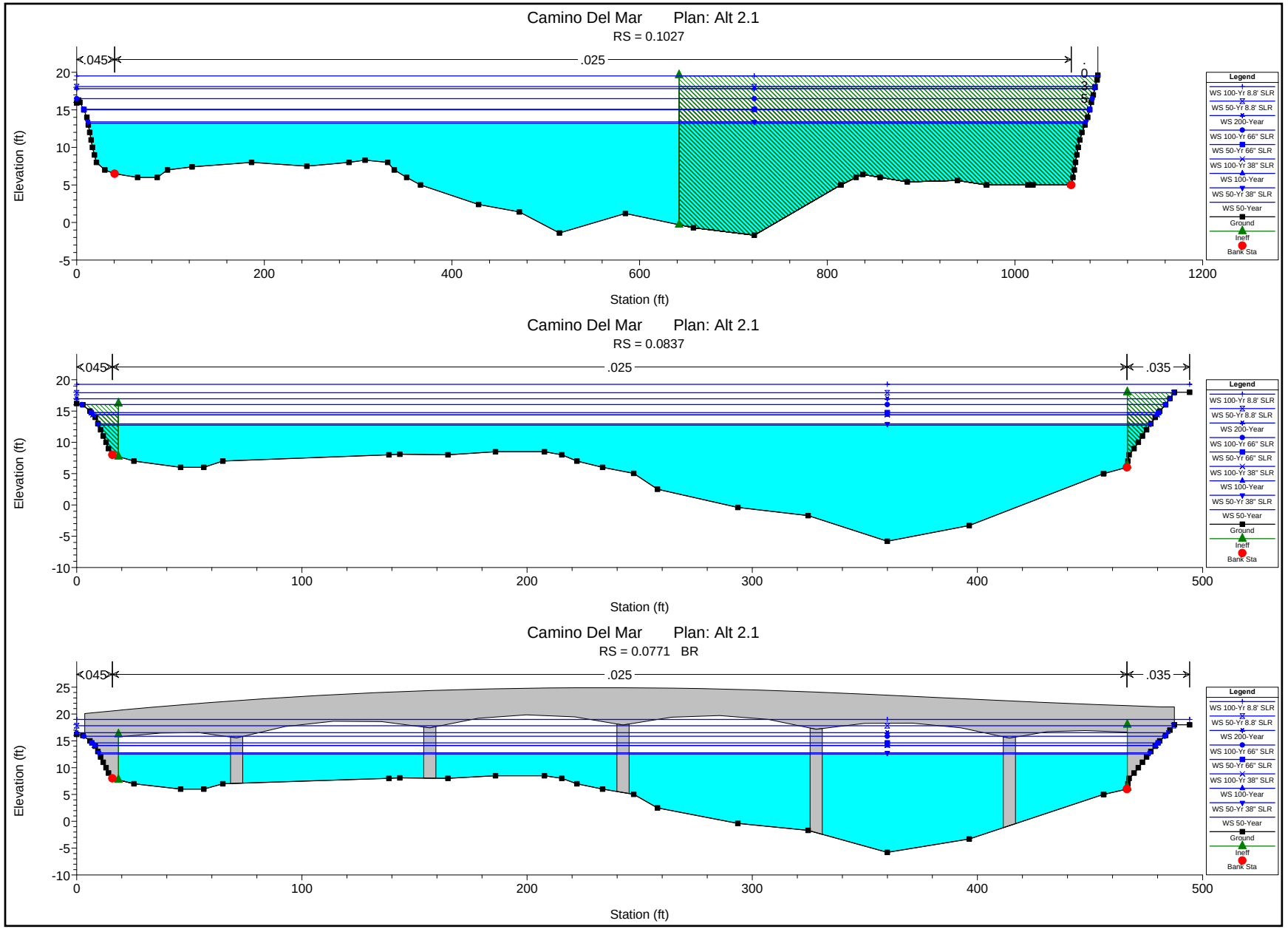
Alternative 2.1 Bridge Results

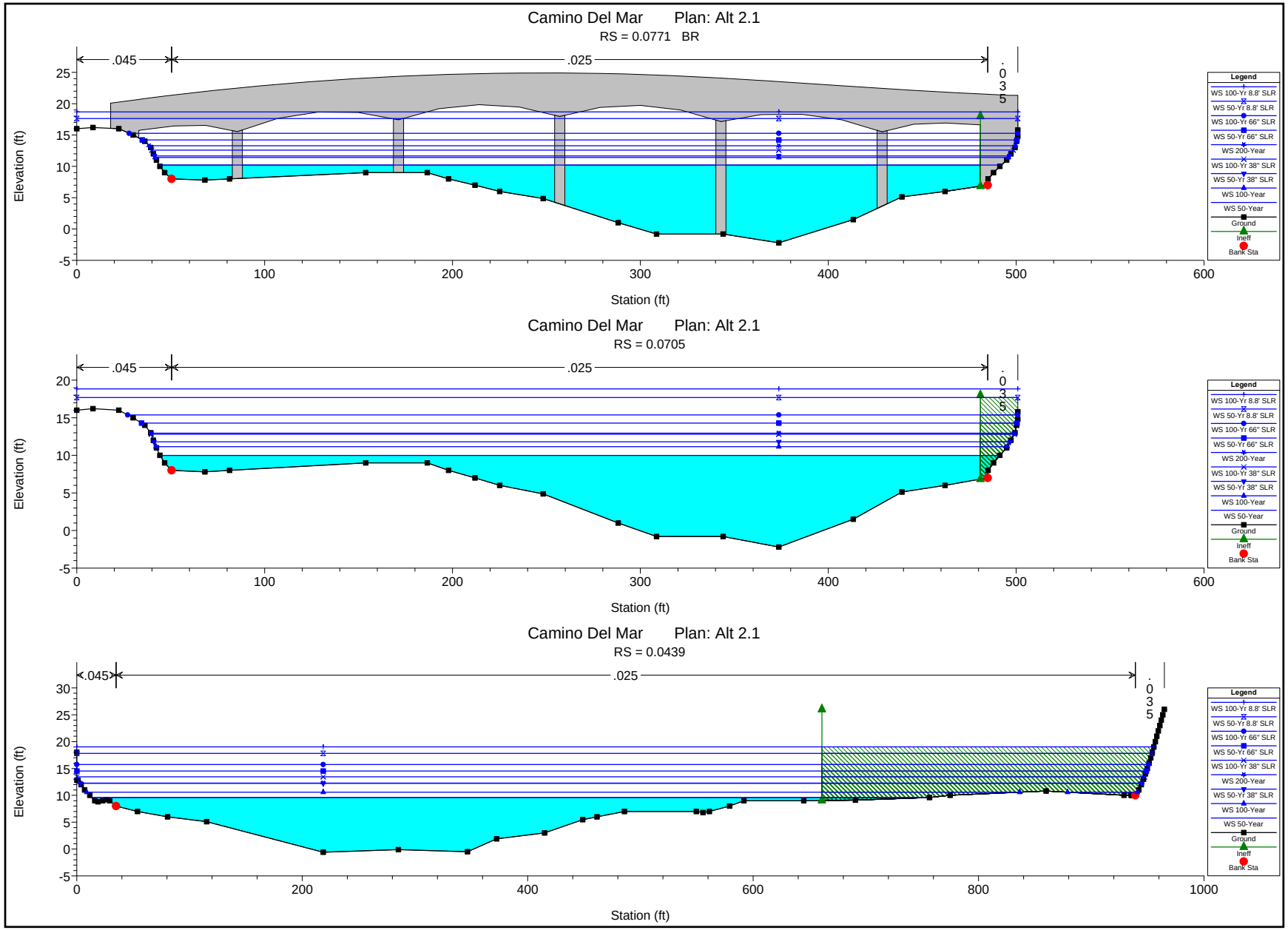
HEC-RAS Plan: Alt 2.1 River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Reach-1	0.1027	50-Year	13.77	13.23		0.06	0.07	1063.30	322.63	31077.37		5.93
Reach-1	0.1027	100-Year	15.67	15.01		0.06	0.09	1071.81	483.99	41316.00		6.55
Reach-1	0.1027	50-Yr 38" SLR	13.92	13.40		0.06	0.06	1064.08	327.97	31072.03		5.81
Reach-1	0.1027	100-Yr 38" SLR	15.69	15.04		0.06	0.09	1072.00	484.47	41315.53		6.53
Reach-1	0.1027	50-Yr 66" SLR	15.42	15.05		0.03	0.05	1072.09	364.10	31035.90		4.90
Reach-1	0.1027	100-Yr 66" SLR	17.00	16.49		0.04	0.07	1082.41	500.90	41299.09		5.73
Reach-1	0.1027	50-Yr 8.8' SLR	18.32	18.10		0.01	0.03	1085.55	435.18	30964.82		3.79
Reach-1	0.1027	100-Yr 8.8' SLR	19.84	19.52		0.02	0.04	1088.28	633.38	41166.62		4.56
Reach-1	0.1027	200-Year	18.66	17.82		0.06	0.13	1084.98	814.20	59185.79		7.40
Reach-1	0.0837	50-Year	13.64	12.75	8.79	0.01	0.03	466.84		31398.36	1.64	7.53
Reach-1	0.0837	100-Year	15.51	14.38	9.92	0.01	0.04	472.37		41797.60	2.40	8.54
Reach-1	0.0837	50-Yr 38" SLR	13.80	12.96	8.79	0.01	0.03	467.46		31398.34	1.66	7.37
Reach-1	0.0837	100-Yr 38" SLR	15.54	14.41	9.92	0.01	0.04	472.53		41797.60	2.40	8.51
Reach-1	0.0837	50-Yr 66" SLR	15.34	14.75	8.79	0.01	0.02	473.98		31398.17	1.83	6.21
Reach-1	0.0837	100-Yr 66" SLR	16.89	16.03	9.92	0.01	0.03	481.32		41797.43	2.57	7.42
Reach-1	0.0837	50-Yr 8.8' SLR	18.28	17.92	8.79	0.00	0.02	487.31	81.12	31316.84	2.04	4.81
Reach-1	0.0837	100-Yr 8.8' SLR	19.78	19.26	9.92	0.00	0.04	494.24	134.52	41408.11	257.38	5.82
Reach-1	0.0837	200-Year	18.47	16.96	11.68	0.01	0.07	485.40	123.07	59873.14	3.79	9.85
Reach-1	0.0771 BR U	50-Year	13.59	12.55	9.02	0.17	0.36	421.01		31399.76	0.24	8.19
Reach-1	0.0771 BR U	100-Year	15.46	14.11	10.19	0.18	0.42	421.01		41799.69	0.31	9.31
Reach-1	0.0771 BR U	50-Yr 38" SLR	13.76	12.76	9.02	0.12	0.16	421.01		31399.76	0.24	8.00
Reach-1	0.0771 BR U	100-Yr 38" SLR	15.49	14.15	10.19	0.15	0.23	421.01		41799.69	0.31	9.28
Reach-1	0.0771 BR U	50-Yr 66" SLR	15.32	14.63	9.02	0.06	0.06	421.01		31399.77	0.23	6.67
Reach-1	0.0771 BR U	100-Yr 66" SLR	16.85	15.86	10.19	0.08	0.08	411.18		41796.71	3.29	8.00
Reach-1	0.0771 BR U	50-Yr 8.8' SLR	18.26	17.81	9.02	0.04	0.02	253.59	4.28	31395.47	0.24	5.36
Reach-1	0.0771 BR U	100-Yr 8.8' SLR	19.73	18.99	10.19	0.08	0.04	111.35	11.90	41780.04	8.05	6.89
Reach-1	0.0771 BR U	200-Year	18.38	16.52	12.02	0.21	0.50	351.32	1.24	59993.50	5.26	10.95
Reach-1	0.0771 BR D	50-Year	13.06	10.21	10.21	0.06	0.05	410.13	23.53	31376.47		13.55
Reach-1	0.0771 BR D	100-Year	14.86	11.42	11.42	0.05	0.06	412.28	66.96	41733.04		14.89
Reach-1	0.0771 BR D	50-Yr 38" SLR	13.47	11.66	10.21	0.02	0.11	412.67	55.99	31344.01		10.82
Reach-1	0.0771 BR D	100-Yr 38" SLR	15.10	12.59	11.42	0.03	0.16	414.05	105.59	41694.41		12.73
Reach-1	0.0771 BR D	50-Yr 66" SLR	15.20	14.22	10.21	0.01	0.05	419.12	112.90	31287.10		7.96
Reach-1	0.0771 BR D	100-Yr 66" SLR	16.69	15.28	11.42	0.01	0.07	421.01	196.88	41603.12		9.54
Reach-1	0.0771 BR D	50-Yr 8.8' SLR	18.19	17.63	10.21	0.00	0.04	286.92	144.05	31255.96		6.04
Reach-1	0.0771 BR D	100-Yr 8.8' SLR	19.62	18.70	11.42	0.01	0.10	134.60	256.03	41543.97		7.70
Reach-1	0.0771 BR D	200-Year	17.67	13.30	13.30	0.05	0.07	415.54	181.78	59818.22		16.81

HEC-RAS Plan: Alt 2.1 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Reach-1	0.0705	50-Year	12.72	9.99	9.99	0.45	0.57	447.01	16.47	31383.53		13.27
Reach-1	0.0705	100-Year	14.45	11.14	11.14	0.44	0.66	453.13	49.59	41750.40		14.58
Reach-1	0.0705	50-Yr 38" SLR	13.34	11.80	9.99	0.14	0.38	455.69	49.86	31350.14		9.97
Reach-1	0.0705	100-Yr 38" SLR	14.91	12.81	11.14	0.16	0.53	459.34	93.36	41706.64		11.65
Reach-1	0.0705	50-Yr 66" SLR	15.14	14.29	9.99	0.06	0.20	466.03	92.15	31307.85		7.43
Reach-1	0.0705	100-Yr 66" SLR	16.60	15.38	11.14	0.07	0.29	473.81	146.17	41653.83		8.89
Reach-1	0.0705	50-Yr 8.8' SLR	18.15	17.68	9.99	0.02	0.11	500.91	201.47	31198.53		5.49
Reach-1	0.0705	100-Yr 8.8' SLR	19.51	18.84	11.14	0.03	0.15	500.91	369.44	41088.59	341.97	6.60
Reach-1	0.0705	200-Year	17.14	12.95	12.95	0.41	0.83	459.84	139.35	59860.64		16.45
Reach-1	0.0439	50-Year	10.90	9.58		0.37	0.06	740.82	18.77	31381.23		9.20
Reach-1	0.0439	100-Year	12.24	10.58		0.34	0.02	889.63	82.10	41717.90		10.33
Reach-1	0.0439	50-Yr 38" SLR	12.82	12.23		0.08	0.02	941.73	141.59	31258.41		6.17
Reach-1	0.0439	100-Yr 38" SLR	14.23	13.44		0.09	0.02	946.98	265.32	41534.68		7.12
Reach-1	0.0439	50-Yr 66" SLR	14.88	14.53		0.03	0.01	948.84	250.15	31149.85		4.78
Reach-1	0.0439	100-Yr 66" SLR	16.24	15.74		0.04	0.02	950.84	395.62	41404.38		5.70
Reach-1	0.0439	50-Yr 8.8' SLR	18.02	17.82		0.01	0.01	953.85	358.34	31041.66		3.62
Reach-1	0.0439	100-Yr 8.8' SLR	19.33	19.03		0.02	0.01	955.50	512.86	41287.14		4.43
Reach-1	0.0439	200-Year	14.40	12.29		0.29	0.02	942.05	275.63	59724.37		11.70


Camino Del Mar Plan: Alt 2.1
RS = 0.1027
.045
.025
.035
Elevation (ft)
Station (ft)
Legend
WS 100-Yr 8.8' SLR
WS 50-Yr 8.8' SLR
WS 200-Year
WS 100-Yr 66" SLR
WS 50-Yr 66" SLR
WS 100-Yr 38" SLR
WS 100-Year
WS 50-Yr 38" SLR
WS 50-Year
Ground
Ineff
Bank Sta
Camino Del Mar Plan: Alt 2.1
RS = 0.0837
Camino Del Mar Plan: Alt 2.1
RS = 0.0771 BR


Camino Del Mar Plan: Alt 2.1
RS = 0.0771 BR
.045
.025
.035
Elevation (ft)
Station (ft)
Legend
WS 100-Yr 8.8' SLR
WS 50-Yr 8.8' SLR
WS 100-Yr 66" SLR
WS 50-Yr 66" SLR
WS 200-Year
WS 100-Yr 38" SLR
WS 50-Yr 38" SLR
WS 100-Year
WS 50-Year
Ground
Ineff
Bank Sta
Camino Del Mar Plan: Alt 2.1
RS = 0.0705
.045
.025
.035
Elevation (ft)
Station (ft)
Camino Del Mar Plan: Alt 2.1
RS = 0.0439
.045
.025
.035
Elevation (ft)
Station (ft)

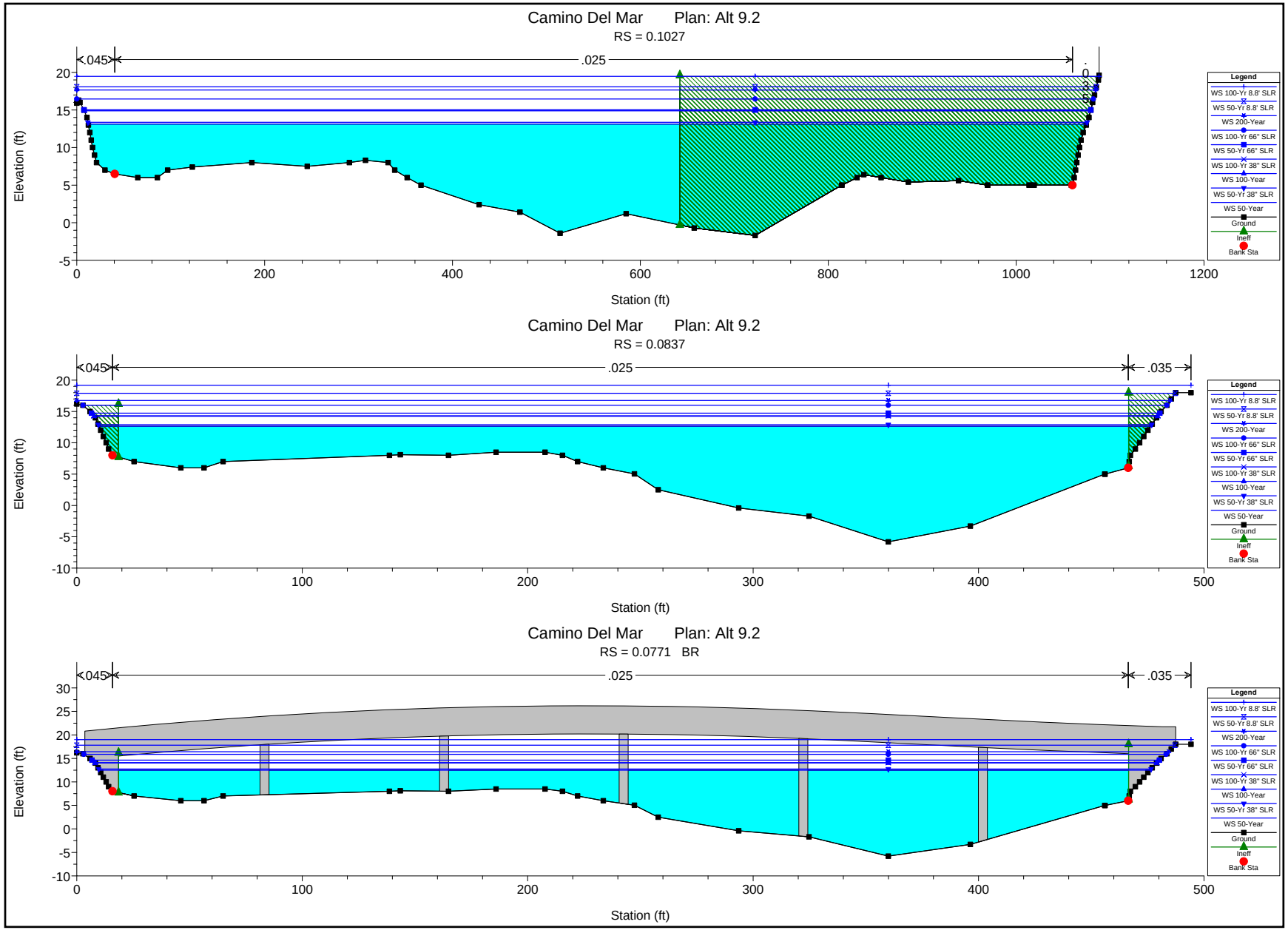
Alternative 9.2 Bridge Results

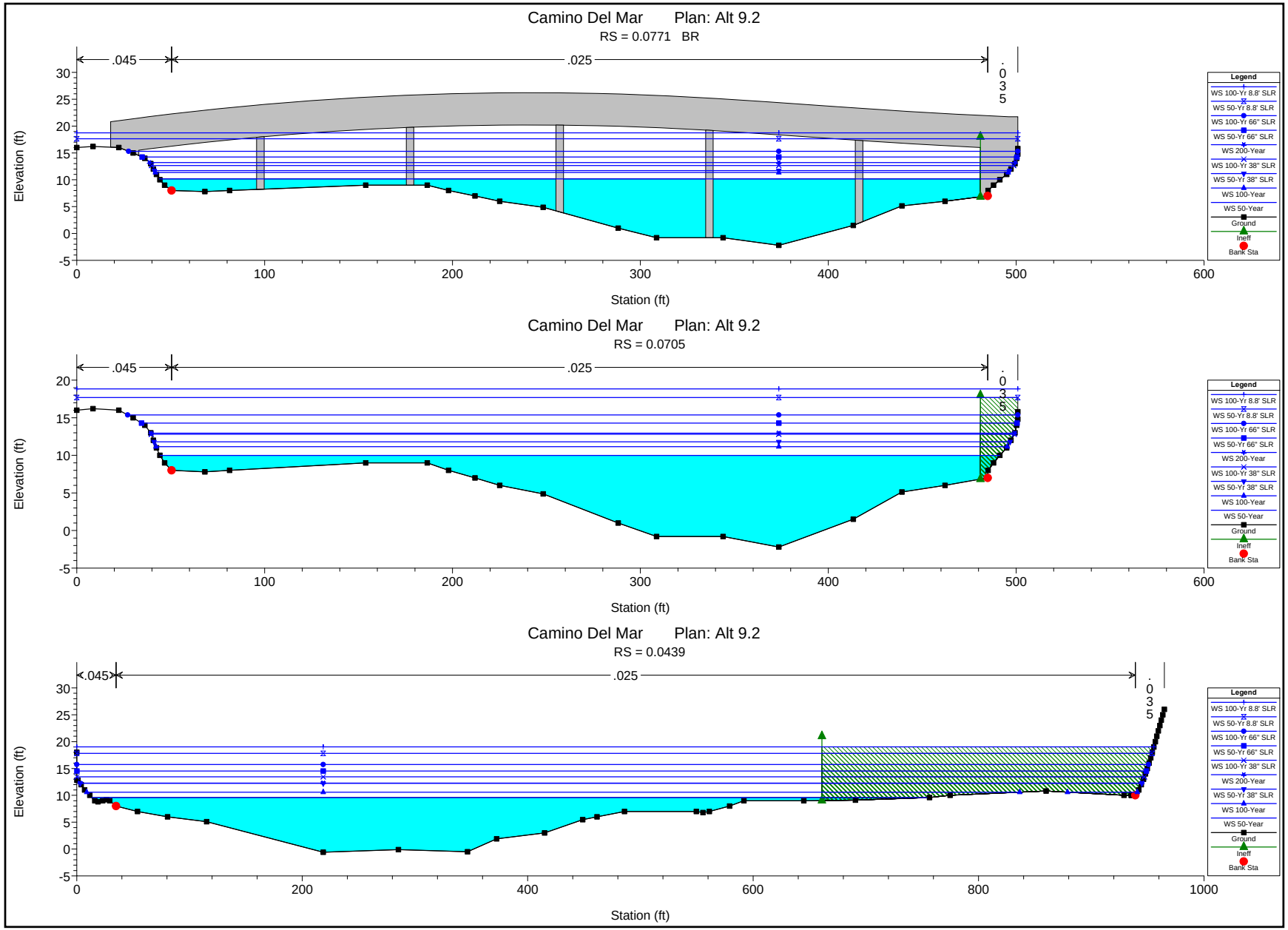
HEC-RAS Plan: Alt 9.2 River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Reach-1	0.1027	50-Year	13.68	13.13		0.06	0.07	1062.86	319.61	31080.38		6.00
Reach-1	0.1027	100-Year	15.56	14.89		0.06	0.10	1071.19	480.98	41319.02		6.62
Reach-1	0.1027	50-Yr 38" SLR	13.88	13.35		0.06	0.07	1063.84	326.36	31073.63		5.85
Reach-1	0.1027	100-Yr 38" SLR	15.62	14.96		0.06	0.10	1071.54	482.73	41317.27		6.58
Reach-1	0.1027	50-Yr 66" SLR	15.40	15.03		0.03	0.05	1071.95	363.83	31036.17		4.91
Reach-1	0.1027	100-Yr 66" SLR	16.96	16.45		0.04	0.07	1082.34	498.89	41301.11		5.75
Reach-1	0.1027	50-Yr 8.8' SLR	18.30	18.08		0.01	0.03	1085.50	434.52	30965.48		3.80
Reach-1	0.1027	100-Yr 8.8' SLR	19.78	19.46		0.02	0.04	1088.20	631.42	41168.58		4.58
Reach-1	0.1027	200-Year	18.51	17.65		0.06	0.14	1084.65	803.14	59196.86		7.49
Reach-1	0.0837	50-Year	13.55	12.64	8.79	0.01	0.02	466.49		31398.38	1.62	7.62
Reach-1	0.0837	100-Year	15.40	14.24	9.92	0.01	0.03	471.75		41797.62	2.38	8.65
Reach-1	0.0837	50-Yr 38" SLR	13.75	12.89	8.79	0.01	0.02	467.27		31398.35	1.65	7.42
Reach-1	0.0837	100-Yr 38" SLR	15.46	14.32	9.92	0.01	0.03	472.10		41797.61	2.39	8.59
Reach-1	0.0837	50-Yr 66" SLR	15.32	14.72	8.79	0.01	0.01	473.87		31398.17	1.83	6.22
Reach-1	0.0837	100-Yr 66" SLR	16.85	15.99	9.92	0.01	0.02	480.77		41797.43	2.57	7.44
Reach-1	0.0837	50-Yr 8.8' SLR	18.26	17.90	8.79	0.00	0.01	487.26	80.77	31317.20	2.03	4.82
Reach-1	0.0837	100-Yr 8.8' SLR	19.72	19.20	9.92	0.00	0.03	494.24	133.40	41412.21	254.38	5.85
Reach-1	0.0837	200-Year	18.31	16.76	11.68	0.01	0.06	485.01	115.90	59880.33	3.77	10.00
Reach-1	0.0771 BR U	50-Year	13.51	12.48	8.97	0.17	0.36	428.01		31399.77	0.24	8.13
Reach-1	0.0771 BR U	100-Year	15.36	14.03	10.13	0.18	0.42	428.01		41799.69	0.31	9.24
Reach-1	0.0771 BR U	50-Yr 38" SLR	13.72	12.75	8.97	0.12	0.15	428.01		31399.76	0.23	7.90
Reach-1	0.0771 BR U	100-Yr 38" SLR	15.42	14.11	10.13	0.14	0.22	428.01		41799.69	0.31	9.16
Reach-1	0.0771 BR U	50-Yr 66" SLR	15.30	14.63	8.97	0.06	0.06	428.01		31399.77	0.23	6.57
Reach-1	0.0771 BR U	100-Yr 66" SLR	16.83	15.86	10.13	0.08	0.08	419.88		41796.76	3.24	7.88
Reach-1	0.0771 BR U	50-Yr 8.8' SLR	18.24	17.81	8.97	0.04	0.02	289.62	4.09	31395.69	0.22	5.23
Reach-1	0.0771 BR U	100-Yr 8.8' SLR	19.69	19.00	10.13	0.06	0.03	209.12	10.65	41782.09	7.26	6.64
Reach-1	0.0771 BR U	200-Year	18.24	16.42	11.94	0.20	0.50	388.23	0.82	59998.75	0.42	10.85
Reach-1	0.0771 BR D	50-Year	12.99	10.17	10.17			417.05	22.42	31377.58		13.47
Reach-1	0.0771 BR D	100-Year	14.76	11.36	11.36			419.17	64.38	41735.62		14.82
Reach-1	0.0771 BR D	50-Yr 38" SLR	13.44	11.70	10.17	0.02	0.08	419.75	56.45	31343.55		10.60
Reach-1	0.0771 BR D	100-Yr 38" SLR	15.06	12.66	11.36	0.03	0.12	421.15	106.66	41693.34		12.44
Reach-1	0.0771 BR D	50-Yr 66" SLR	15.19	14.24	10.17	0.01	0.04	426.24	111.82	31288.18		7.82
Reach-1	0.0771 BR D	100-Yr 66" SLR	16.67	15.31	11.36	0.01	0.05	428.01	195.88	41604.12		9.37
Reach-1	0.0771 BR D	50-Yr 8.8' SLR	18.18	17.64	10.17	0.00	0.03	316.51	131.24	31268.76		5.89
Reach-1	0.0771 BR D	100-Yr 8.8' SLR	19.59	18.73	11.36	0.01	0.08	239.31	219.27	41580.73		7.44
Reach-1	0.0771 BR D	200-Year	17.54	13.21	13.21	0.05	0.05	422.28	176.70	59823.30		16.72

HEC-RAS Plan: Alt 9.2 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Reach-1	0.0705	50-Year	12.72	9.99	9.99	0.45	0.57	447.01	16.47	31383.53		13.27
Reach-1	0.0705	100-Year	14.45	11.14	11.14	0.44	0.66	453.13	49.59	41750.40		14.58
Reach-1	0.0705	50-Yr 38" SLR	13.34	11.80	9.99	0.14	0.38	455.69	49.86	31350.14		9.97
Reach-1	0.0705	100-Yr 38" SLR	14.91	12.81	11.14	0.16	0.53	459.34	93.36	41706.64		11.65
Reach-1	0.0705	50-Yr 66" SLR	15.14	14.29	9.99	0.06	0.20	466.03	92.15	31307.85		7.43
Reach-1	0.0705	100-Yr 66" SLR	16.60	15.38	11.14	0.07	0.29	473.81	146.17	41653.83		8.89
Reach-1	0.0705	50-Yr 8.8' SLR	18.15	17.68	9.99	0.02	0.11	500.91	201.47	31198.53		5.49
Reach-1	0.0705	100-Yr 8.8' SLR	19.51	18.84	11.14	0.03	0.15	500.91	369.44	41088.59	341.97	6.60
Reach-1	0.0705	200-Year	17.14	12.95	12.95	0.41	0.83	459.84	139.35	59860.64		16.45
Reach-1	0.0439	50-Year	10.90	9.58	8.11	0.37	0.06	740.82	18.77	31381.23		9.20
Reach-1	0.0439	100-Year	12.24	10.58	9.32	0.34	0.02	889.63	82.10	41717.90		10.33
Reach-1	0.0439	50-Yr 38" SLR	12.82	12.23	8.11	0.08	0.02	941.73	141.59	31258.41		6.17
Reach-1	0.0439	100-Yr 38" SLR	14.23	13.44	9.32	0.09	0.02	946.98	265.32	41534.68		7.12
Reach-1	0.0439	50-Yr 66" SLR	14.88	14.53	8.11	0.03	0.01	948.84	250.15	31149.85		4.78
Reach-1	0.0439	100-Yr 66" SLR	16.24	15.74	9.32	0.04	0.02	950.84	395.62	41404.38		5.70
Reach-1	0.0439	50-Yr 8.8' SLR	18.02	17.82	8.11	0.01	0.01	953.85	358.34	31041.66		3.62
Reach-1	0.0439	100-Yr 8.8' SLR	19.33	19.03	9.32	0.02	0.01	955.50	512.86	41287.14		4.43
Reach-1	0.0439	200-Year	14.40	12.29	10.73	0.29	0.02	942.05	275.63	59724.37		11.70


Camino Del Mar Plan: Alt 9.2
RS = 0.1027
.045
.025
.0
Elevation (ft)
Station (ft)
Legend
WS 100-Yr 8.8' SLR
WS 50-Yr 8.8' SLR
WS 200-Year
WS 100-Yr 66" SLR
WS 50-Yr 66" SLR
WS 100-Yr 38" SLR
WS 100-Year
WS 50-Yr 38" SLR
WS 50-Year
Ground
Ineff
Bank Sta
Camino Del Mar Plan: Alt 9.2
RS = 0.0837
.045
.025
.035
Elevation (ft)
Station (ft)
Camino Del Mar Plan: Alt 9.2
RS = 0.0771 BR
.045
.025
.035
Elevation (ft)
Station (ft)


Camino Del Mar Plan: Alt 9.2
RS = 0.0771 BR
.045
.025
.035
Elevation (ft)
Station (ft)
Legend
WS 100-Yr 8.8" SLR
WS 50-Yr 8.8" SLR
WS 100-Yr 66" SLR
WS 50-Yr 66" SLR
WS 200-Year
WS 100-Yr 38" SLR
WS 50-Yr 38" SLR
WS 100-Year
WS 50-Year
Ground
Ineff
Bank Sta
Camino Del Mar Plan: Alt 9.2
RS = 0.0705
.045
.025
.035
Elevation (ft)
Station (ft)
Camino Del Mar Plan: Alt 9.2
RS = 0.0439
.045
.025
.035
Elevation (ft)
Station (ft)

200-Year Results for Pier Scour

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: 200-Year

Reach	River Sta	Profile	Plan	Q Total	Froude # Chl	W.S. Elev	Top Width	Vel Chnl
				(cfs)		(ft)	(ft)	(ft/s)
Reach-1	0.1027	200-Year	Alt 1.1	60000.00	0.36	17.77	1084.89	7.42
Reach-1	0.1027	200-Year	Alt 2.1	60000.00	0.36	17.82	1084.98	7.40
Reach-1	0.1027	200-Year	Alt 9.2	60000.00	0.36	17.65	1084.65	7.49
Reach-1	0.0837	200-Year	Alt 1.1	60000.00	0.48	16.91	485.30	9.89
Reach-1	0.0837	200-Year	Alt 2.1	60000.00	0.47	16.96	485.40	9.85
Reach-1	0.0837	200-Year	Alt 9.2	60000.00	0.48	16.76	485.01	10.00
Reach-1	0.0771 BR U	200-Year	Alt 1.1	60000.00	0.41	16.47	339.81	10.98
Reach-1	0.0771 BR U	200-Year	Alt 2.1	60000.00	0.41	16.52	351.32	10.95
Reach-1	0.0771 BR U	200-Year	Alt 9.2	60000.00	0.41	16.42	388.23	10.85
Reach-1	0.0771 BR D	200-Year	Alt 1.1	60000.00	0.75	13.29	418.92	16.75
Reach-1	0.0771 BR D	200-Year	Alt 2.1	60000.00	0.75	13.30	415.54	16.81
Reach-1	0.0771 BR D	200-Year	Alt 9.2	60000.00	0.75	13.21	422.28	16.72
Reach-1	0.0705	200-Year	Alt 1.1	60000.00	1.00	12.95	459.84	16.45
Reach-1	0.0705	200-Year	Alt 2.1	60000.00	1.00	12.95	459.84	16.45
Reach-1	0.0705	200-Year	Alt 9.2	60000.00	1.00	12.95	459.84	16.45
Reach-1	0.0439	200-Year	Alt 1.1	60000.00	0.72	12.29	942.05	11.70
Reach-1	0.0439	200-Year	Alt 2.1	60000.00	0.72	12.29	942.05	11.70
Reach-1	0.0439	200-Year	Alt 9.2	60000.00	0.72	12.29	942.05	11.70

100-Year Results of Alternatives 1.1, 2.1, and 9.2 for Comparison along Entire Study Reach

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: 100-Year

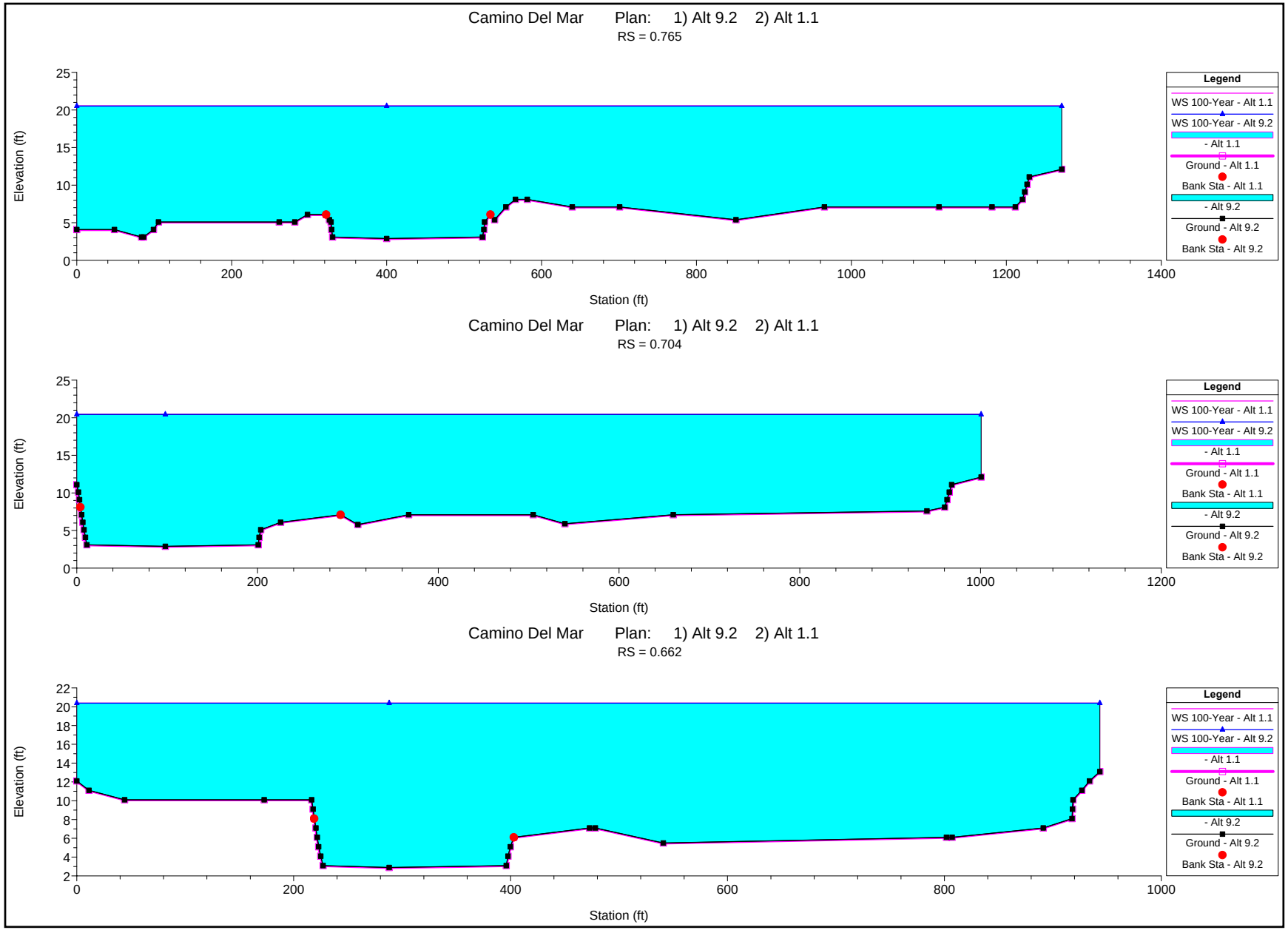
Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	0.765	100-Year	Alt 1.1	42400	2.90	20.52		20.61	0.000055	2.94	18615.01	1271.44	0.12
Reach-1	0.765	100-Year	Alt 2.1	42400	2.90	20.53		20.61	0.000055	2.94	18621.20	1271.44	0.12
Reach-1	0.765	100-Year	Alt 9.2	42400	2.90	20.52		20.60	0.000055	2.94	18607.45	1271.44	0.12
Reach-1	0.704	100-Year	Alt 1.1	42400	2.90	20.43		20.59	0.000095	3.71	14086.20	1000.69	0.16
Reach-1	0.704	100-Year	Alt 2.1	42400	2.90	20.44		20.59	0.000095	3.70	14091.15	1000.69	0.16
Reach-1	0.704	100-Year	Alt 9.2	42400	2.90	20.43		20.58	0.000095	3.71	14080.16	1000.69	0.16
Reach-1	0.662	100-Year	Alt 1.1	42400	2.90	20.38		20.56	0.000120	4.30	12902.17	943.31	0.18
Reach-1	0.662	100-Year	Alt 2.1	42400	2.90	20.38		20.57	0.000120	4.30	12906.89	943.31	0.18
Reach-1	0.662	100-Year	Alt 9.2	42400	2.90	20.37		20.56	0.000120	4.30	12896.40	943.31	0.18
Reach-1	0.617	100-Year	Alt 1.1	42400	2.90	20.11		20.51	0.000223	5.75	9054.25	682.31	0.25
Reach-1	0.617	100-Year	Alt 2.1	42400	2.90	20.12		20.51	0.000222	5.75	9057.83	682.31	0.25
Reach-1	0.617	100-Year	Alt 9.2	42400	2.90	20.11		20.50	0.000223	5.75	9049.88	682.31	0.25
Reach-1	0.582	100-Year	Alt 1.1	41800	2.80	18.63	13.63	20.31	0.000976	10.59	4408.92	460.45	0.50
Reach-1	0.582	100-Year	Alt 2.1	41800	2.80	18.64	13.63	20.31	0.000974	10.59	4412.47	460.45	0.50
Reach-1	0.582	100-Year	Alt 9.2	41800	2.80	18.62	13.63	20.30	0.000978	10.60	4404.59	460.45	0.50
Reach-1	0.575			Bridge									
Reach-1	0.568	100-Year	Alt 1.1	41800	2.80	16.59		19.12	0.001772	12.84	3460.16	451.05	0.66
Reach-1	0.568	100-Year	Alt 2.1	41800	2.80	16.60		19.12	0.001766	12.82	3464.56	451.05	0.66
Reach-1	0.568	100-Year	Alt 9.2	41800	2.80	16.56		19.10	0.001786	12.87	3448.70	451.05	0.66
Reach-1	0.531	100-Year	Alt 1.1	41800	2.90	17.24	12.71	18.50	0.000830	9.76	5086.32	488.67	0.46
Reach-1	0.531	100-Year	Alt 2.1	41800	2.90	17.24	12.71	18.51	0.000828	9.75	5089.82	488.67	0.46
Reach-1	0.531	100-Year	Alt 9.2	41800	2.90	17.22	12.71	18.48	0.000834	9.78	5077.21	488.67	0.46
Reach-1	0.486	100-Year	Alt 1.1	41800	2.80	17.07		18.30	0.000765	9.44	5051.18	408.85	0.45
Reach-1	0.486	100-Year	Alt 2.1	41800	2.80	17.08		18.31	0.000763	9.43	5054.58	408.85	0.45
Reach-1	0.486	100-Year	Alt 9.2	41800	2.80	17.05		18.29	0.000769	9.45	5042.35	408.85	0.45
Reach-1	0.442	100-Year	Alt 1.1	41800	2.60	16.99		18.09	0.000741	9.35	5569.44	483.80	0.44
Reach-1	0.442	100-Year	Alt 2.1	41800	2.60	17.00		18.09	0.000739	9.34	5573.66	483.80	0.44
Reach-1	0.442	100-Year	Alt 9.2	41800	2.60	16.97		18.07	0.000746	9.37	5558.45	483.80	0.44
Reach-1	0.398	100-Year	Alt 1.1	41800	2.90	16.32		17.84	0.001062	10.61	4758.79	485.44	0.52
Reach-1	0.398	100-Year	Alt 2.1	41800	2.90	16.33		17.85	0.001059	10.60	4764.25	485.44	0.52
Reach-1	0.398	100-Year	Alt 9.2	41800	2.90	16.29		17.82	0.001072	10.64	4744.54	485.44	0.52

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: 100-Year (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	0.356	100-Year	Alt 1.1	41800	2.90	15.39		17.49	0.001643	12.34	3983.84	495.52	0.63
Reach-1	0.356	100-Year	Alt 2.1	41800	2.90	15.41		17.50	0.001634	12.32	3991.92	495.52	0.63
Reach-1	0.356	100-Year	Alt 9.2	41800	2.90	15.34		17.46	0.001669	12.40	3962.53	495.52	0.64
Reach-1	0.321	100-Year	Alt 1.1	41800	1.50	14.19		17.06	0.002189	14.85	3563.49	450.00	0.75
Reach-1	0.321	100-Year	Alt 2.1	41800	1.50	14.24		17.08	0.002157	14.78	3581.51	450.00	0.74
Reach-1	0.321	100-Year	Alt 9.2	41800	1.50	14.06		17.02	0.002286	15.07	3510.30	450.00	0.76
Reach-1	0.293	100-Year	Alt 1.1	41800	1.10	15.74	9.43	16.21	0.000375	6.72	8602.37	778.30	0.32
Reach-1	0.293	100-Year	Alt 2.1	41800	1.10	15.77	9.43	16.24	0.000372	6.71	8623.51	778.35	0.31
Reach-1	0.293	100-Year	Alt 9.2	41800	1.10	15.67	9.43	16.15	0.000382	6.77	8545.96	778.15	0.32
Reach-1	0.2895			Bridge									
Reach-1	0.286	100-Year	Alt 1.1	41800	1.10	15.61		16.09	0.000388	6.80	8501.64	778.04	0.32
Reach-1	0.286	100-Year	Alt 2.1	41800	1.10	15.64		16.12	0.000385	6.78	8522.98	778.09	0.32
Reach-1	0.286	100-Year	Alt 9.2	41800	1.10	15.54		16.03	0.000396	6.85	8444.59	777.89	0.32
Reach-1	0.262	100-Year	Alt 1.1	41800	2.90	15.71		16.00	0.000220	4.35	9863.96	959.45	0.23
Reach-1	0.262	100-Year	Alt 2.1	41800	2.90	15.74		16.03	0.000218	4.34	9889.83	959.52	0.23
Reach-1	0.262	100-Year	Alt 9.2	41800	2.90	15.64		15.94	0.000225	4.38	9794.80	959.26	0.23
Reach-1	0.229	100-Year	Alt 1.1	41800	2.90	15.56		15.95	0.000303	5.02	8590.00	884.98	0.27
Reach-1	0.229	100-Year	Alt 2.1	41800	2.90	15.59		15.98	0.000300	5.00	8614.85	885.14	0.27
Reach-1	0.229	100-Year	Alt 9.2	41800	2.90	15.49		15.88	0.000310	5.05	8523.52	884.55	0.27
Reach-1	0.198	100-Year	Alt 1.1	41800	2.90	15.37		15.88	0.000405	5.80	7440.88	800.12	0.31
Reach-1	0.198	100-Year	Alt 2.1	41800	2.90	15.40		15.91	0.000402	5.78	7462.52	800.12	0.31
Reach-1	0.198	100-Year	Alt 9.2	41800	2.90	15.29		15.81	0.000416	5.84	7382.95	800.12	0.32
Reach-1	0.167	100-Year	Alt 1.1	41800	2.90	15.31		15.82	0.000387	5.79	7495.08	798.27	0.31
Reach-1	0.167	100-Year	Alt 2.1	41800	2.90	15.34		15.84	0.000384	5.77	7516.61	798.33	0.31
Reach-1	0.167	100-Year	Alt 9.2	41800	2.90	15.23		15.74	0.000397	5.83	7437.36	798.11	0.31
Reach-1	0.133	100-Year	Alt 1.1	41800	2.10	15.35		15.72	0.000241	4.93	8588.39	1353.70	0.25
Reach-1	0.133	100-Year	Alt 2.1	41800	2.10	15.38		15.75	0.000239	4.92	8609.48	1353.79	0.25
Reach-1	0.133	100-Year	Alt 9.2	41800	2.10	15.27		15.65	0.000246	4.97	8531.87	1353.47	0.25
Reach-1	0.1027	100-Year	Alt 1.1	41800	-1.70	14.97		15.64	0.000535	6.57	6488.20	1071.63	0.36
Reach-1	0.1027	100-Year	Alt 2.1	41800	-1.70	15.01		15.67	0.000529	6.55	6509.01	1071.81	0.36
Reach-1	0.1027	100-Year	Alt 9.2	41800	-1.70	14.89		15.56	0.000550	6.62	6432.33	1071.19	0.36

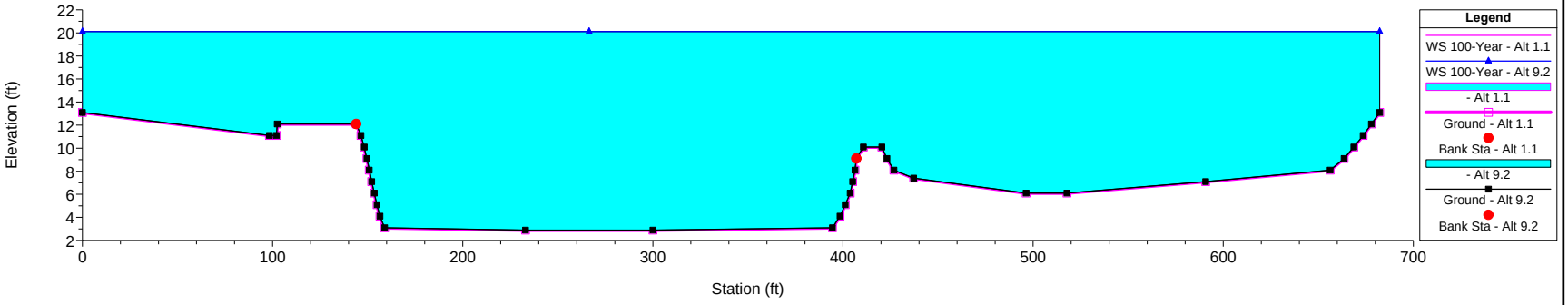
HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: 100-Year (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	0.0837	100-Year	Alt 1.1	41800	-5.80	14.34	9.92	15.48	0.000865	8.57	4878.84	472.20	0.46
Reach-1	0.0837	100-Year	Alt 2.1	41800	-5.80	14.38	9.92	15.51	0.000855	8.54	4895.85	472.37	0.46
Reach-1	0.0837	100-Year	Alt 9.2	41800	-5.80	14.24	9.92	15.40	0.000893	8.65	4832.96	471.75	0.46
Reach-1	0.0771			Bridge									
Reach-1	0.0705	100-Year	Alt 1.1	41800	-2.20	11.14	11.14	14.45	0.004827	14.58	2878.28	453.13	1.00
Reach-1	0.0705	100-Year	Alt 2.1	41800	-2.20	11.14	11.14	14.45	0.004827	14.58	2878.28	453.13	1.00
Reach-1	0.0705	100-Year	Alt 9.2	41800	-2.20	11.14	11.14	14.45	0.004827	14.58	2878.28	453.13	1.00
Reach-1	0.0439	100-Year	Alt 1.1	41800	-0.60	10.58		12.24	0.002522	10.33	4075.22	889.63	0.72
Reach-1	0.0439	100-Year	Alt 2.1	41800	-0.60	10.58		12.24	0.002522	10.33	4075.22	889.63	0.72
Reach-1	0.0439	100-Year	Alt 9.2	41800	-0.60	10.58	9.32	12.24	0.002522	10.33	4075.22	889.63	0.72
Reach-1	0.0208	100-Year	Alt 1.1	41800	0.70	10.11		11.88	0.003015	10.68	3936.74	674.95	0.77
Reach-1	0.0208	100-Year	Alt 2.1	41800	0.70	10.11		11.88	0.003015	10.68	3936.74	674.95	0.77
Reach-1	0.0208	100-Year	Alt 9.2	41800	0.70	10.11		11.88	0.003015	10.68	3936.74	674.95	0.77
Reach-1	0.0001	100-Year	Alt 1.1	41800	0.40	10.20	7.72	11.52	0.001502	9.22	4582.77	585.43	0.57
Reach-1	0.0001	100-Year	Alt 2.1	41800	0.40	10.20	7.72	11.52	0.001502	9.22	4582.77	585.43	0.57
Reach-1	0.0001	100-Year	Alt 9.2	41800	0.40	10.20	7.72	11.52	0.001502	9.22	4582.77	585.43	0.57


Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.765
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.704
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.662
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2

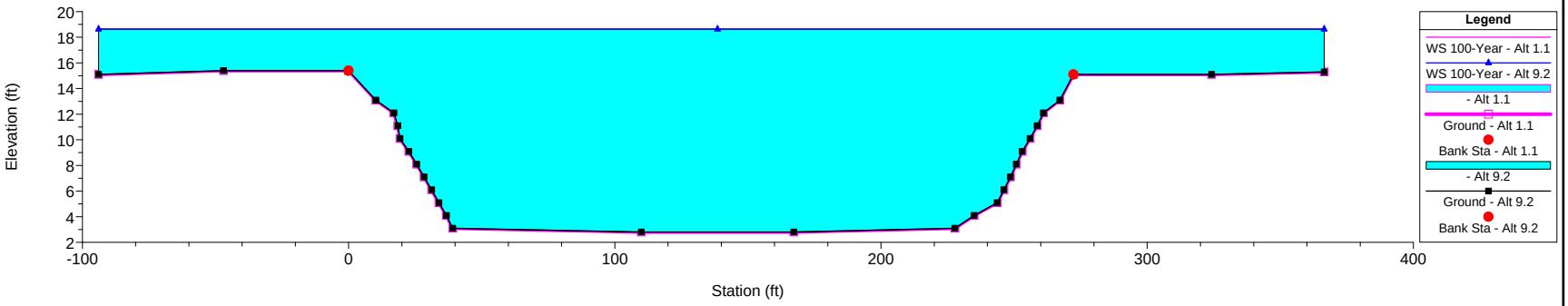
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1

RS = 0.617



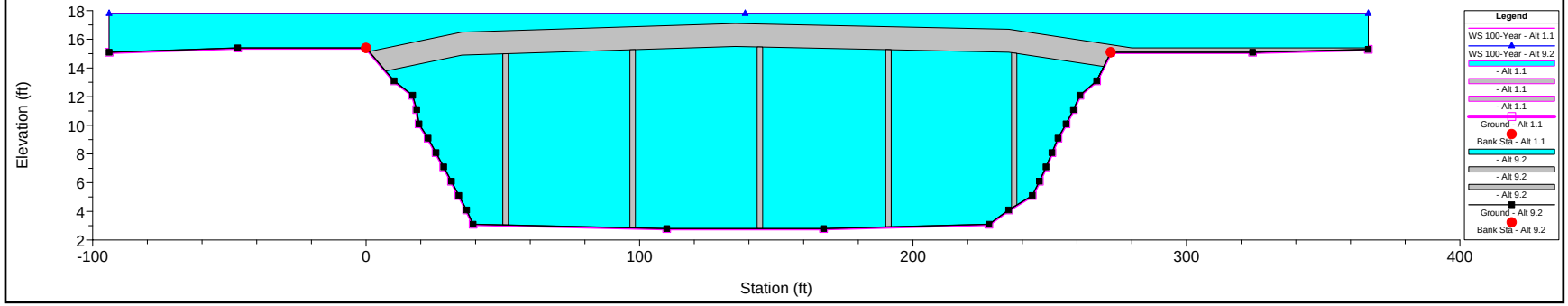
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1

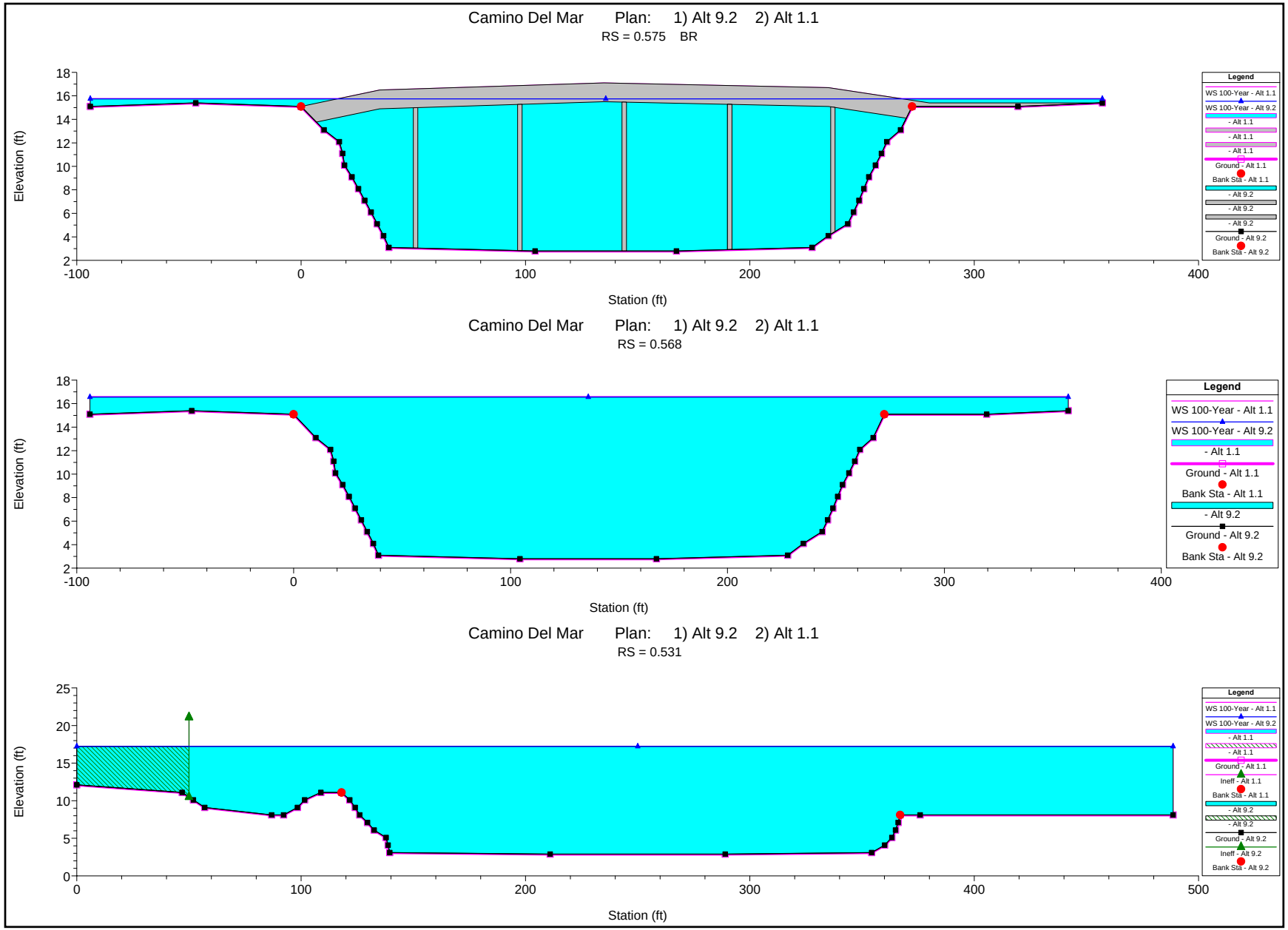
RS = 0.582

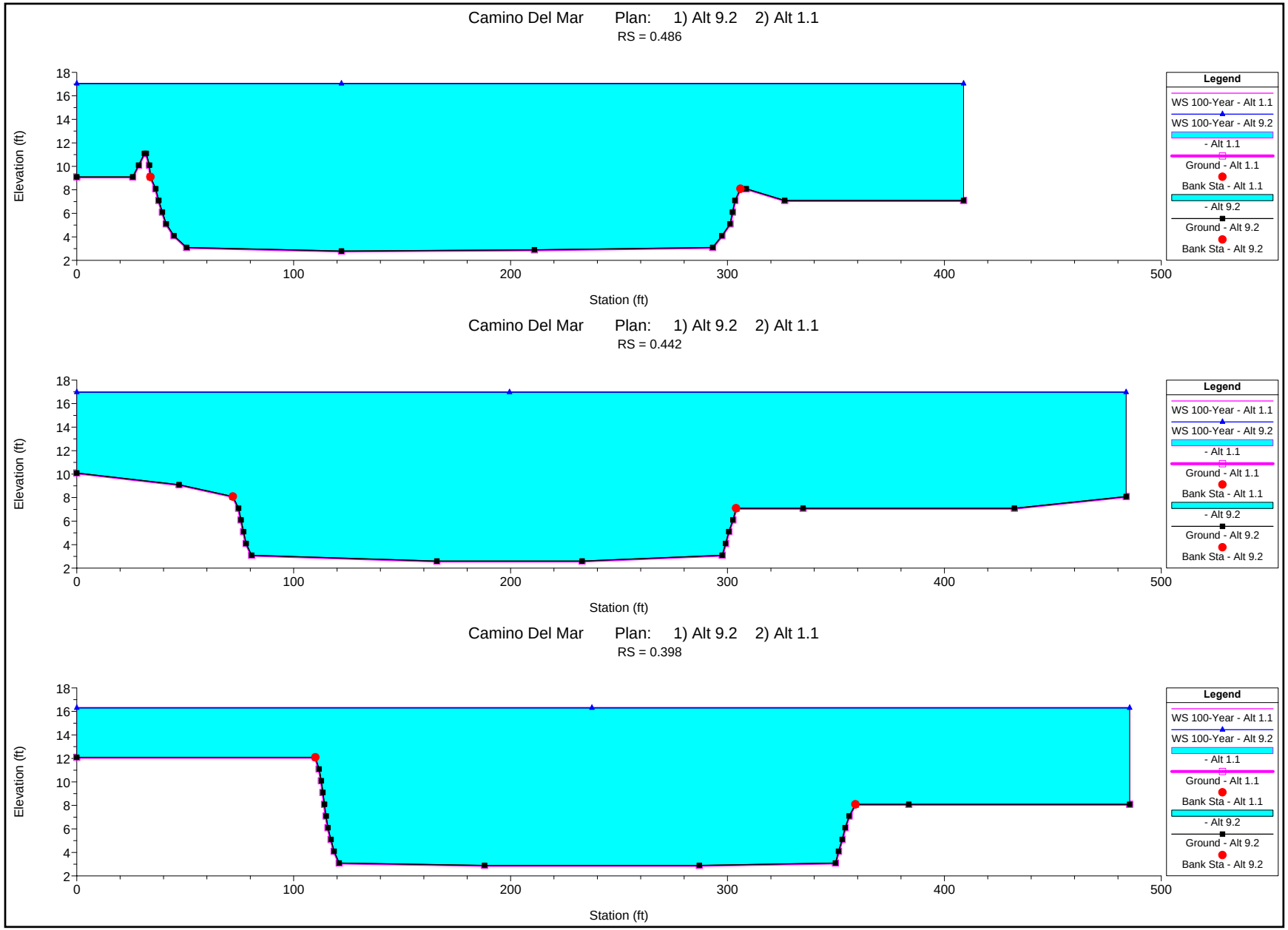


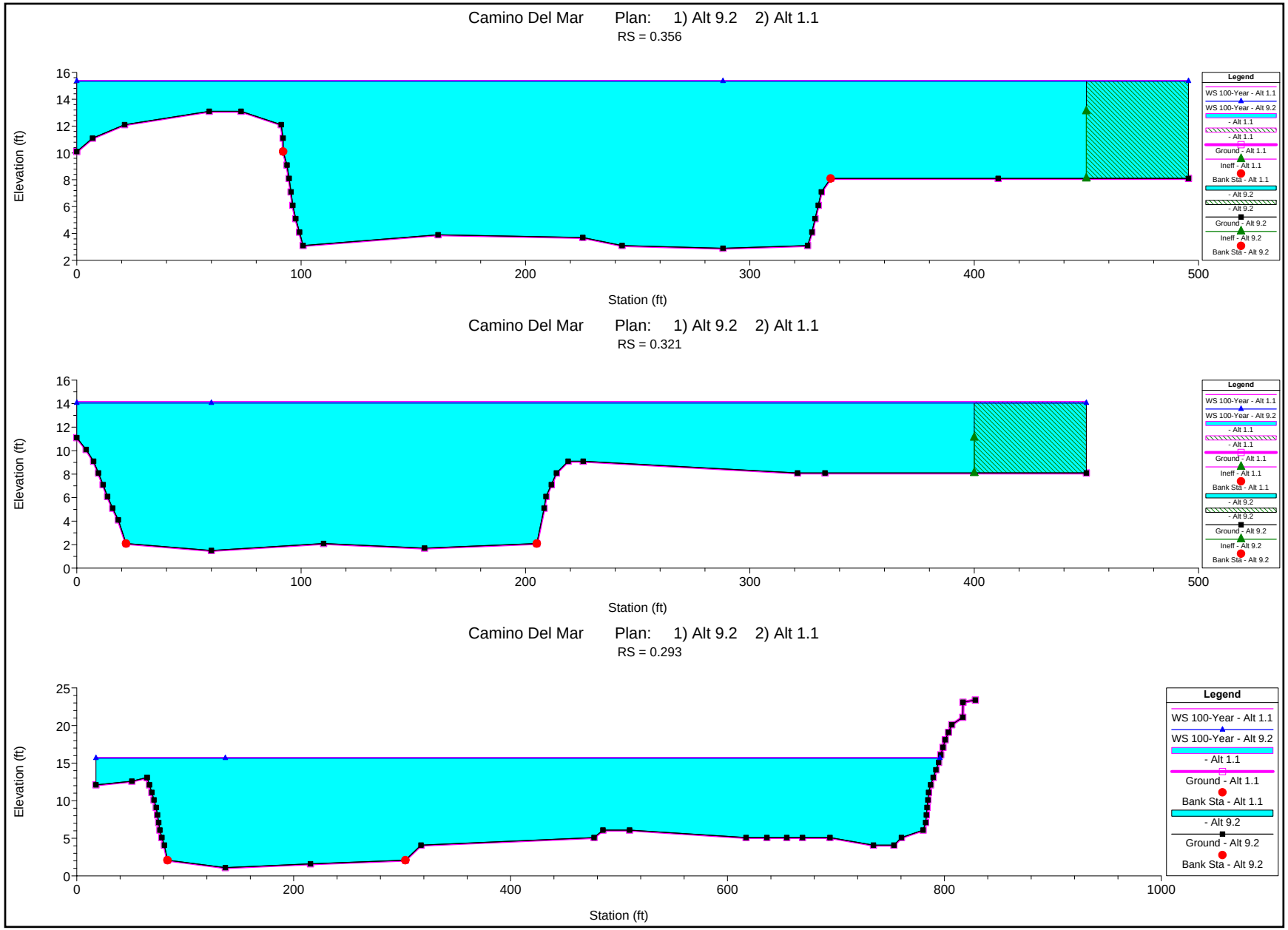
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1

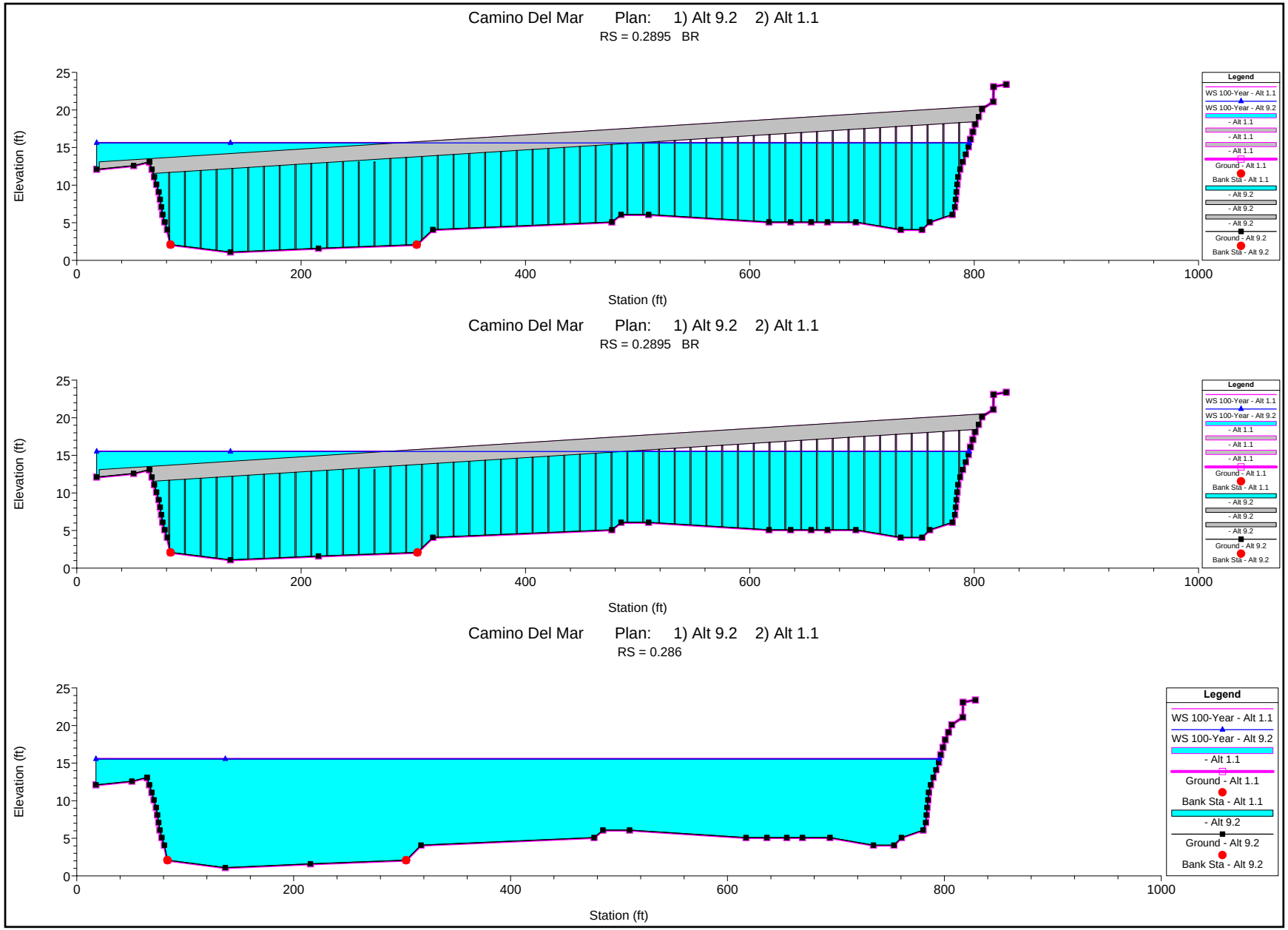
RS = 0.575 BR

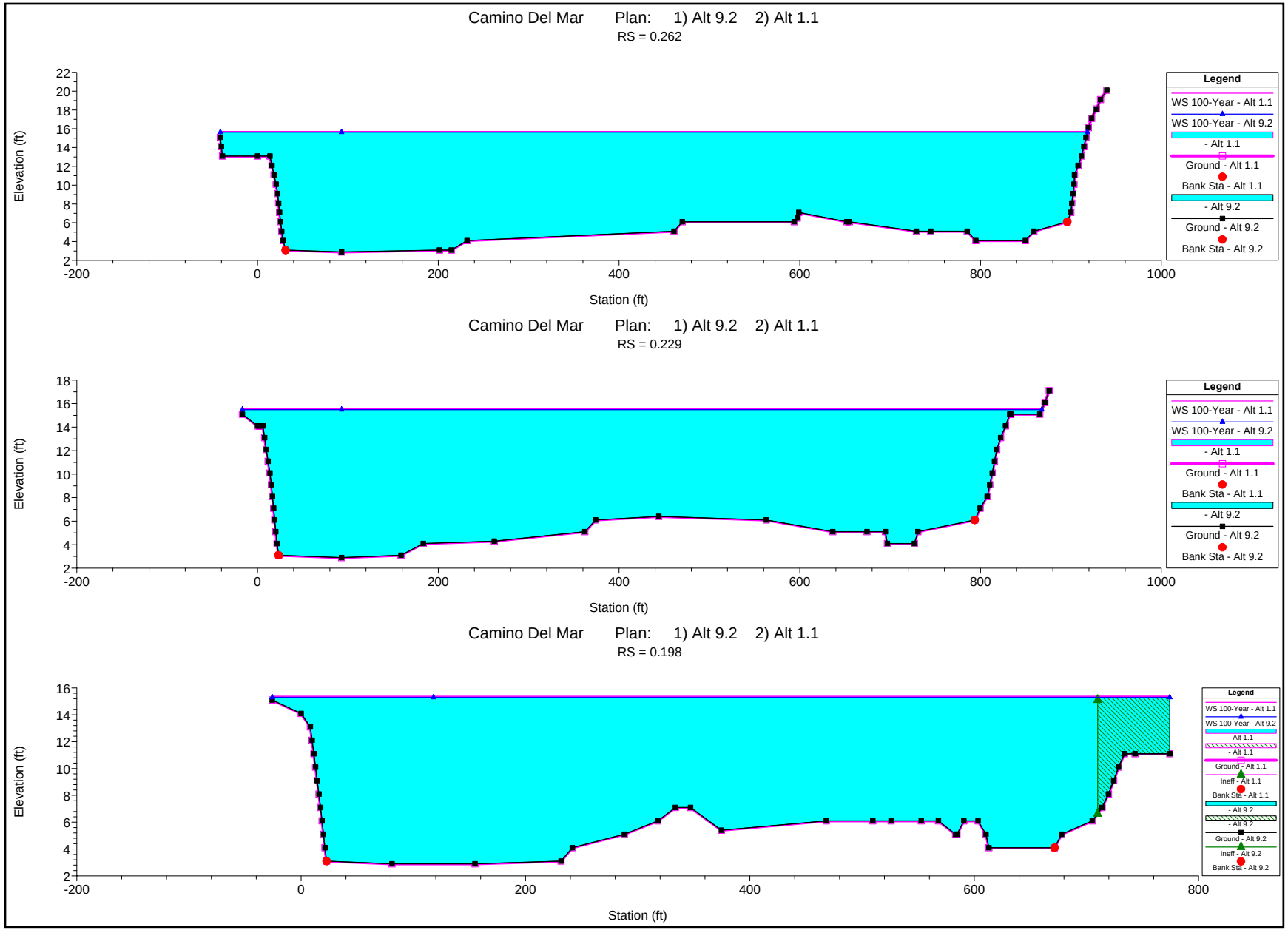


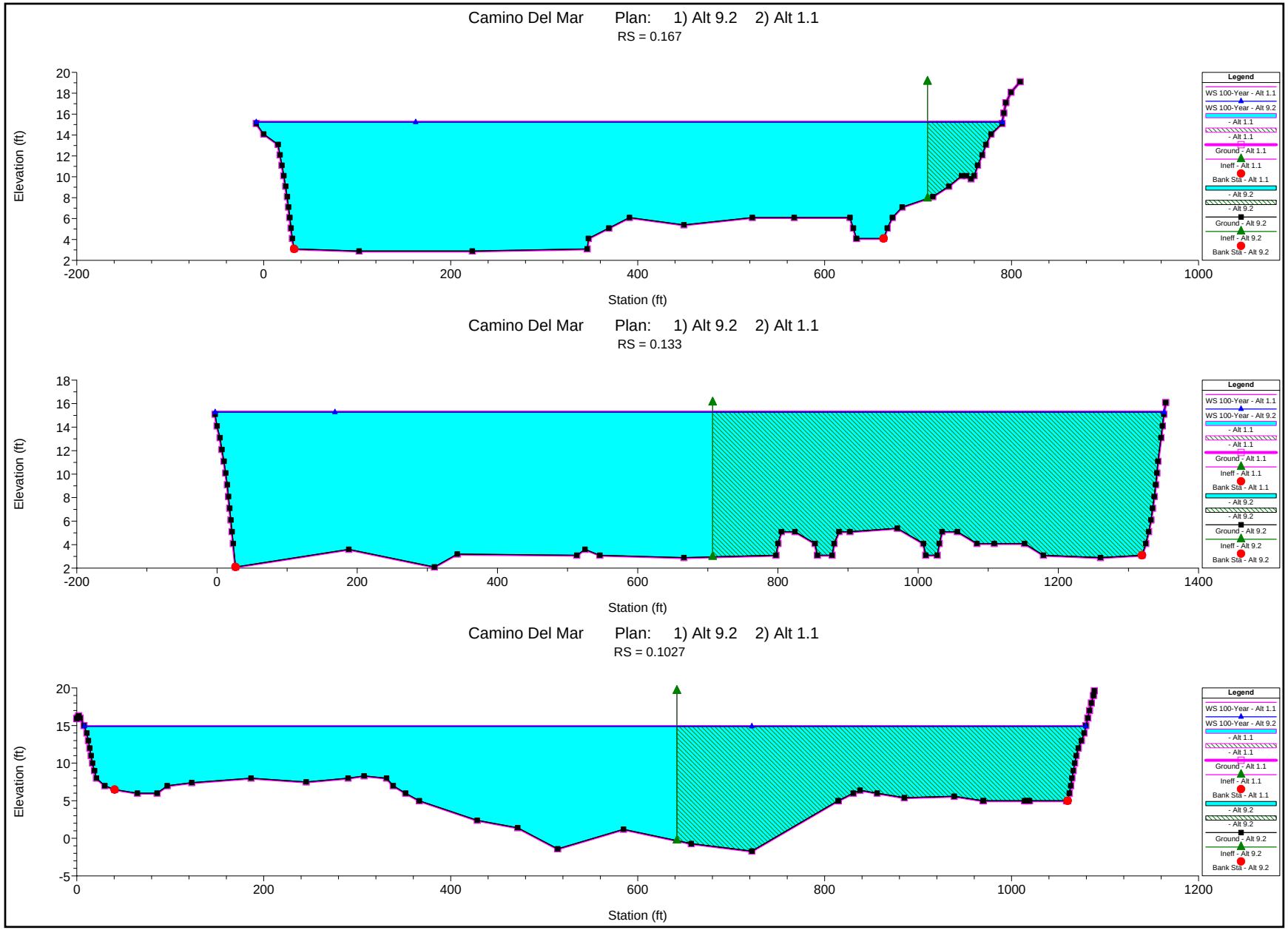

Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.575 BR
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
- Alt 1.1
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
- Alt 9.2
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.568
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.531
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
- Alt 1.1
Ground - Alt 1.1
Ineff - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
- Alt 9.2
Ground - Alt 9.2
Ineff - Alt 9.2
Bank Sta - Alt 9.2


Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.486
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.442
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.398
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2


Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.356
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
- Alt 1.1
Ground - Alt 1.1
Ineff - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
- Alt 9.2
Ground - Alt 9.2
Ineff - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.321
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
- Alt 1.1
Ground - Alt 1.1
Ineff - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
- Alt 9.2
Ground - Alt 9.2
Ineff - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.293
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2

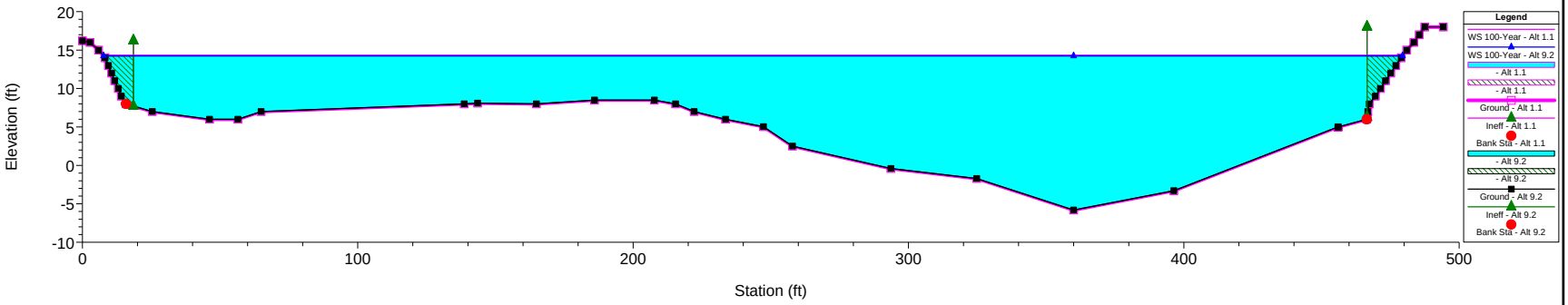

Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.2895 BR
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
- Alt 1.1
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
- Alt 9.2
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.2895 BR
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
- Alt 1.1
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
- Alt 9.2
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.286
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2


Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.262
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.229
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
Ground - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
Ground - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.198
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
- Alt 1.1
Ground - Alt 1.1
Ineff - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
- Alt 9.2
Ground - Alt 9.2
Ineff - Alt 9.2
Bank Sta - Alt 9.2


Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.167
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
- Alt 1.1
Ground - Alt 1.1
Ineff - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
- Alt 9.2
Ground - Alt 9.2
Ineff - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.133
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
- Alt 1.1
Ground - Alt 1.1
Ineff - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
- Alt 9.2
Ground - Alt 9.2
Ineff - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.1027
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
- Alt 1.1
Ground - Alt 1.1
Ineff - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
- Alt 9.2
Ground - Alt 9.2
Ineff - Alt 9.2
Bank Sta - Alt 9.2

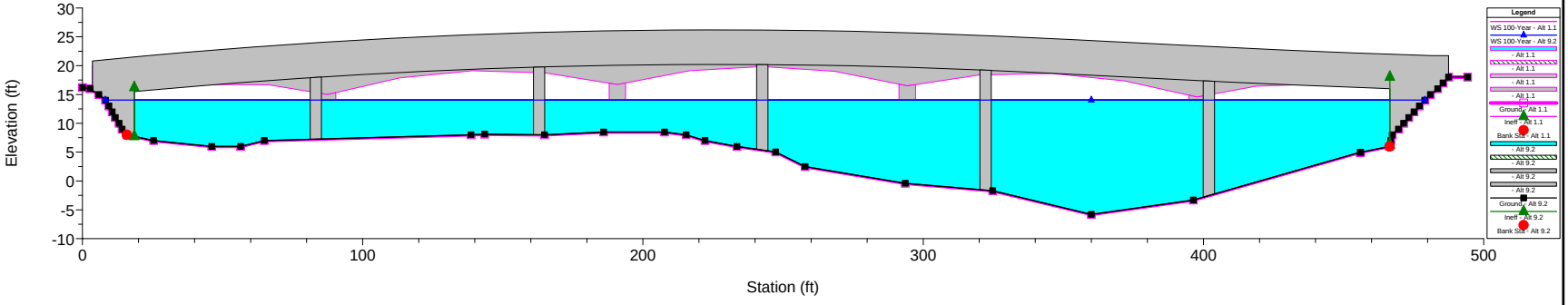
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1

RS = 0.0837



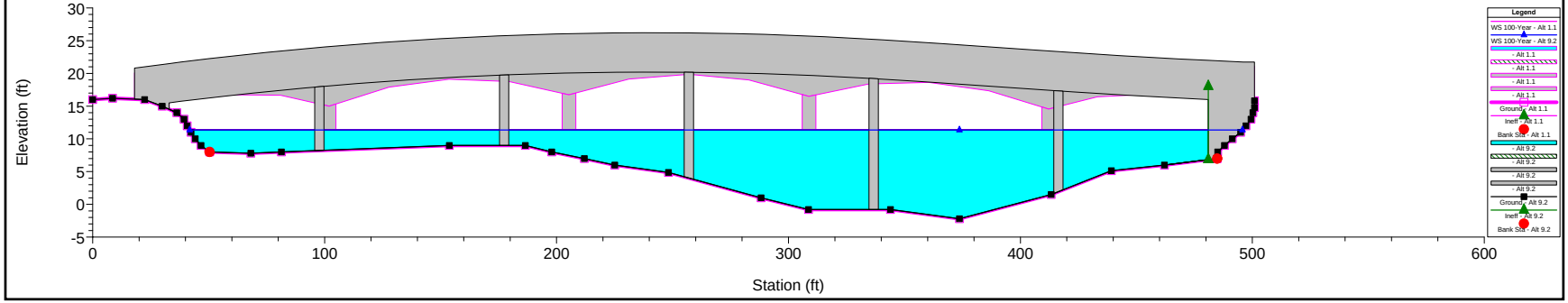
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1

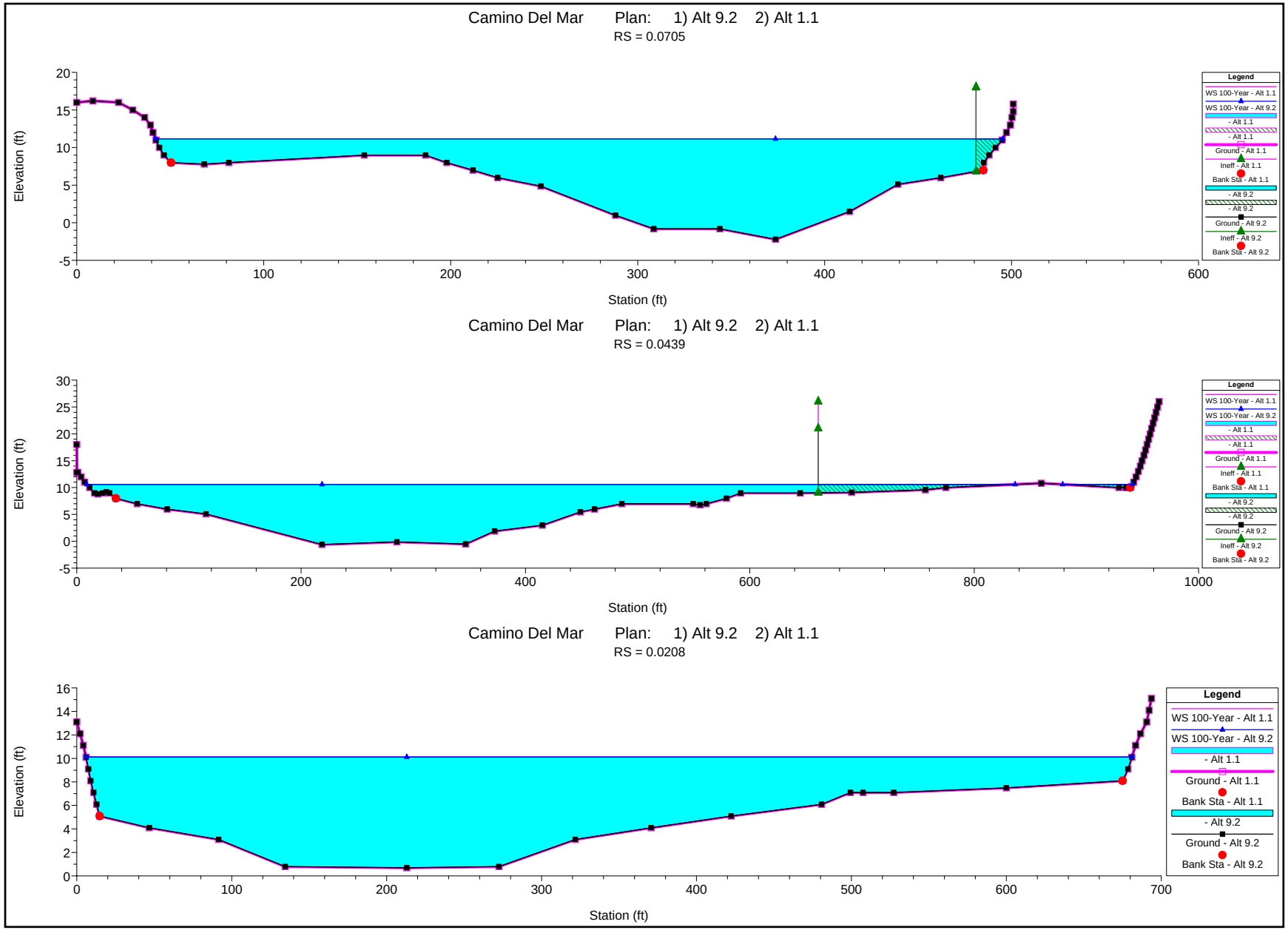
RS = 0.0771 BR



Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1

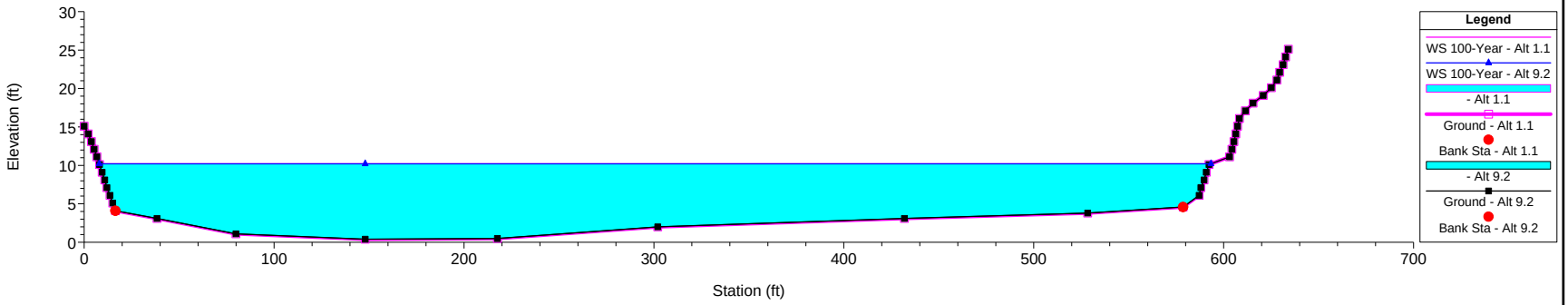
RS = 0.0771 BR




Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.0705
Elevation (ft)
Station (ft)
Legend
WS 100-Year - Alt 1.1
WS 100-Year - Alt 9.2
- Alt 1.1
- Alt 1.1
Ground - Alt 1.1
Ineff - Alt 1.1
Bank Sta - Alt 1.1
- Alt 9.2
- Alt 9.2
Ground - Alt 9.2
Ineff - Alt 9.2
Bank Sta - Alt 9.2
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.0439
Elevation (ft)
Station (ft)
Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1
RS = 0.0208
Elevation (ft)
Station (ft)

Camino Del Mar Plan: 1) Alt 9.2 2) Alt 1.1

RS = 0.0001



PROFILE BASELINE

ELEVATIONS DOWNSTREAM OF THIS POINT ARE CONTROLLED BY TIDAL INFLUENCE FROM PACIFIC OCEAN

ATCHISON TOPEKA AND SANTA FE RAILROAD

CAMINO DEL MAR

ELEVATION IN FEET (NAVD)

30
20
10.2
10
9
0

STREAM DISTANCE IN FEET ABOVE MOUTH

200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800

A B C

LEGEND

- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

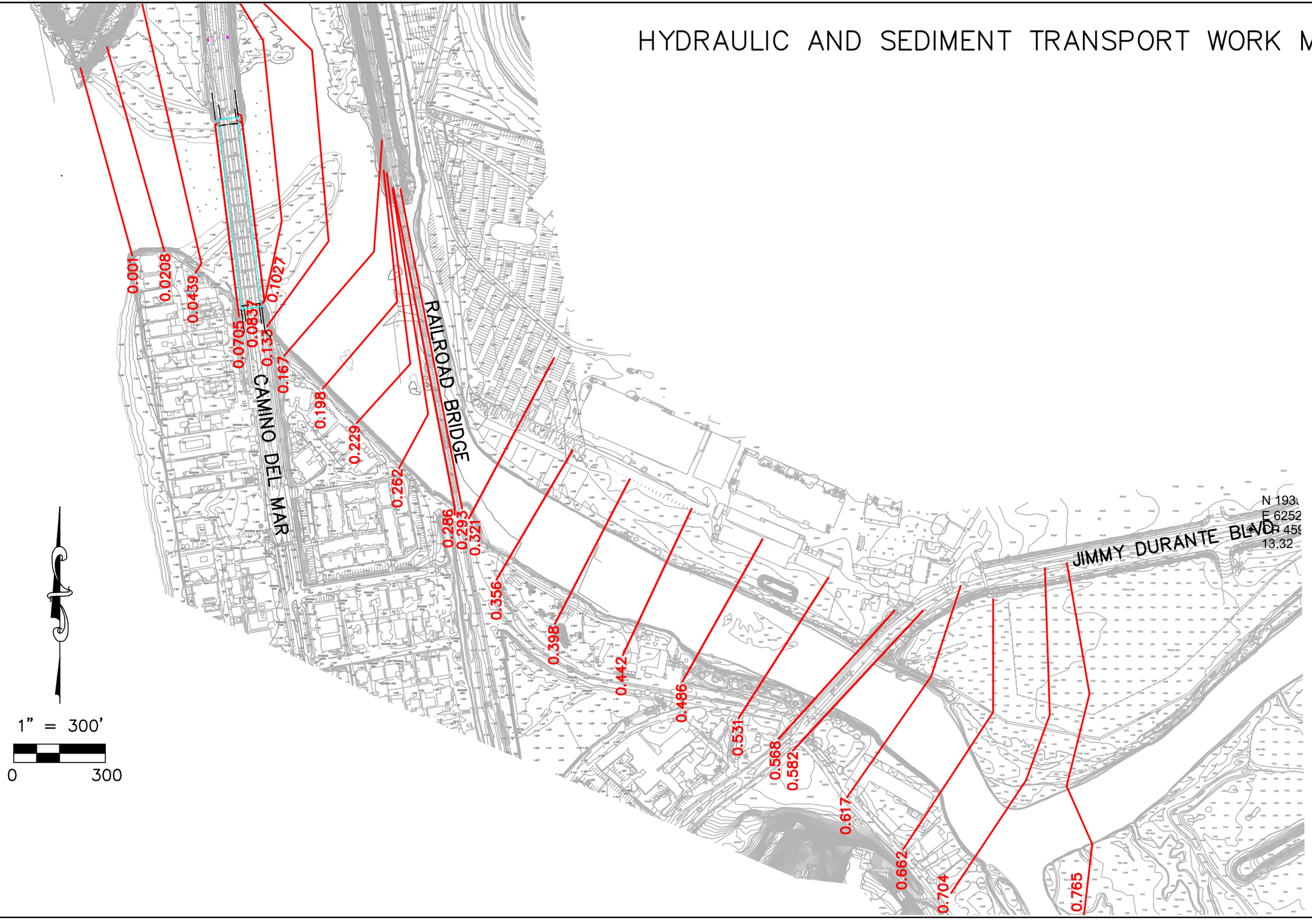
SAN DIEGUITO RIVER

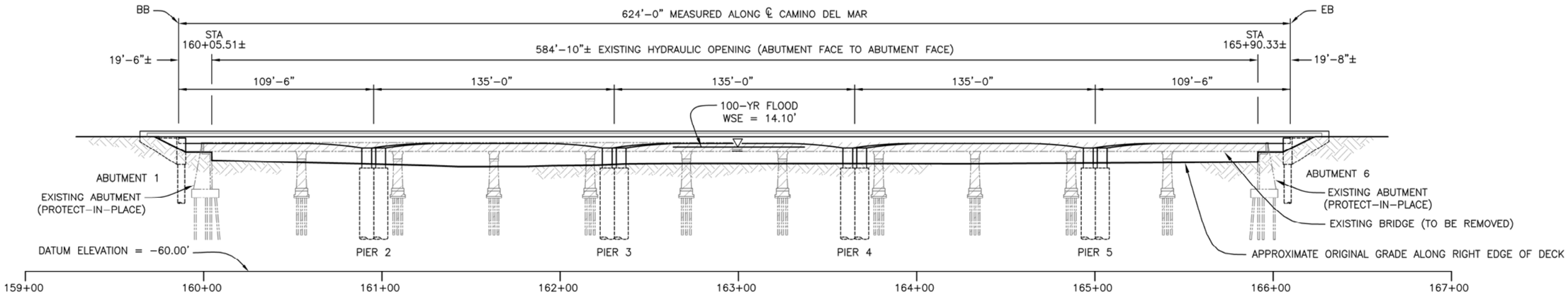
FEDERAL EMERGENCY MANAGEMENT AGENCY

SAN DIEGO COUNTY, CA
(AND INCORPORATED AREAS)

379P

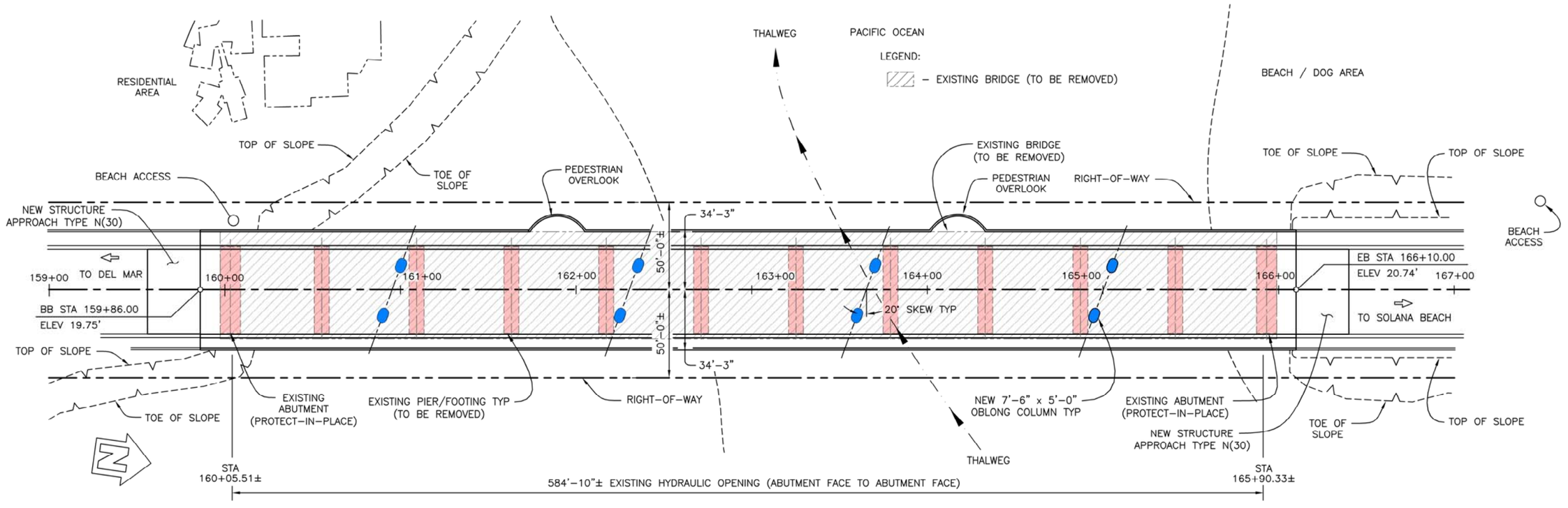
HYDRAULIC AND SEDIMENT TRANSPORT WORK MAP





ELEVATION

1" = 30'–0"



PLAN

1" = 30'–0"

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
11	2,350±

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
5	257

ALTERNATIVE 1.1: 5-SPAN VARIABLE DEPTH CAST-IN-PLACE PRESTRESSED CONCRETE BOX GIRDER BRIDGE WITH TWO COLUMNS PER PIER

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH

ENGINEER OF WORK | R.C.E. NO. | DATE

KLEINFELDER
Bright people. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA 92101 (619) 831–4600

DRAFT

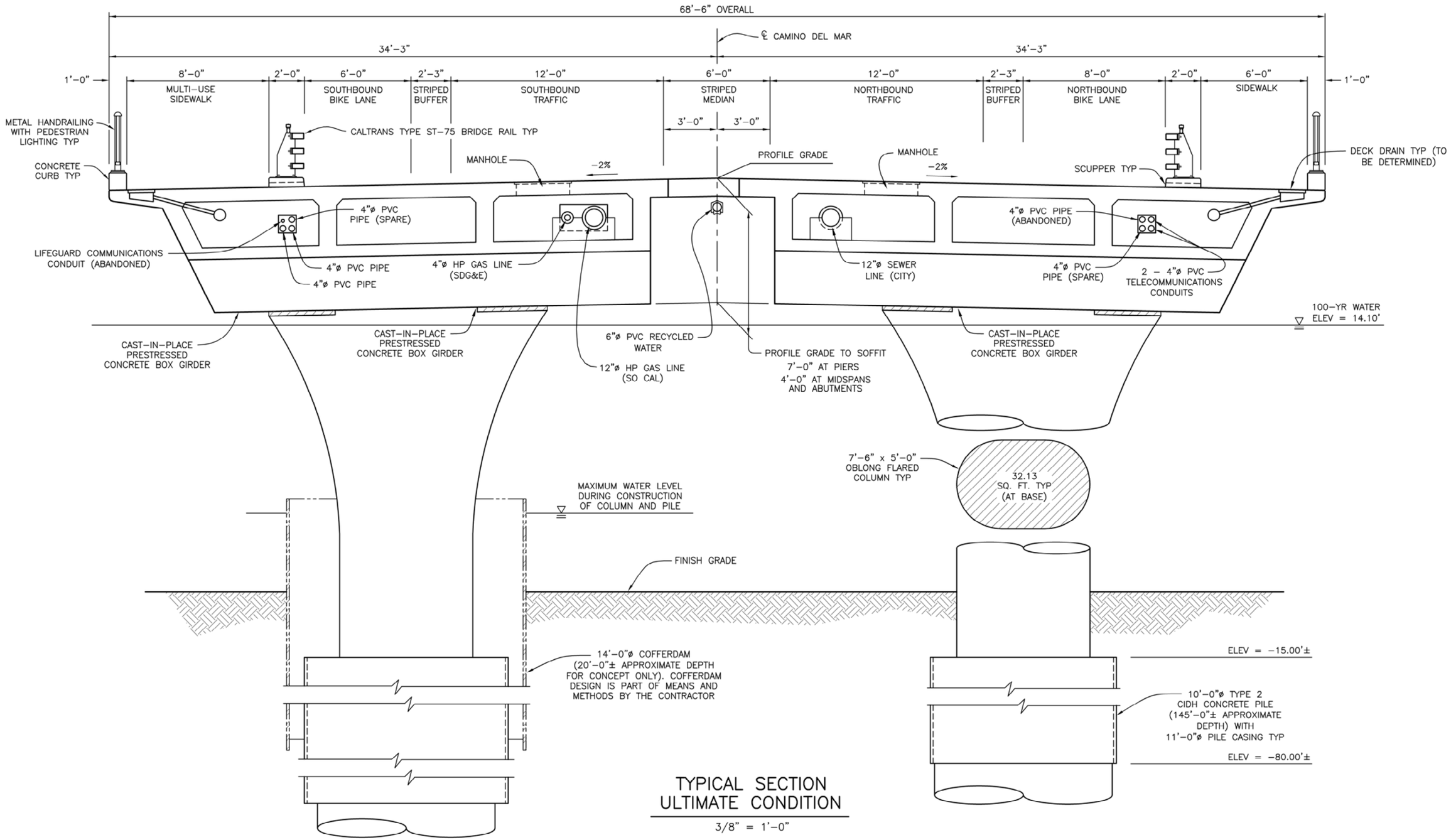
APPROVED

PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1.1
GENERAL PLAN (1 OF 2)

BR-08

ORIGINAL SCALE: 0 1" 2" 3" 4" 5" 6" INCHES 11" 12"



TYPICAL SECTION
ULTIMATE CONDITION

3/8" = 1'-0"

ALTERNATIVE 1.1: 5-SPAN VARIABLE DEPTH CAST-IN-PLACE PRESTRESSED CONCRETE BOX GIRDER BRIDGE WITH TWO COLUMNS PER PIER

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH

ENGINEER OF WORK | R.C.E. NO. | DATE

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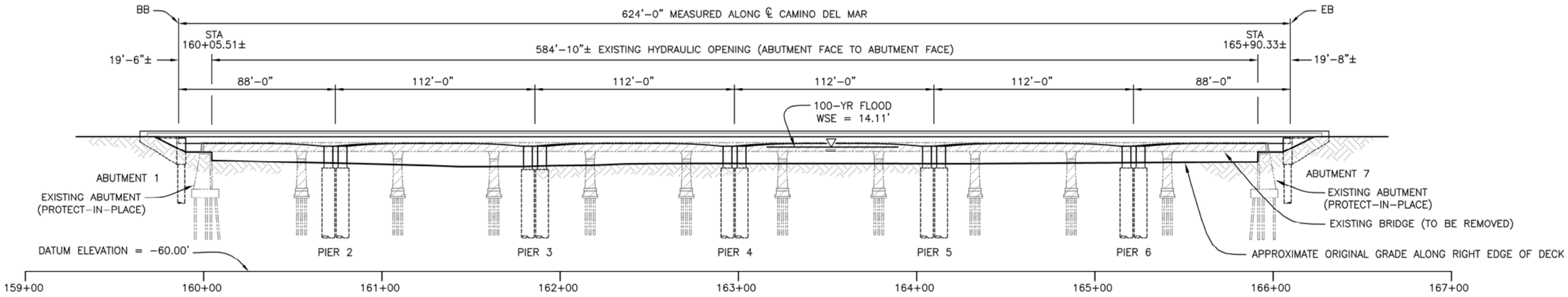
APPROVED

PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 1.1
GENERAL PLAN (2 OF 2)

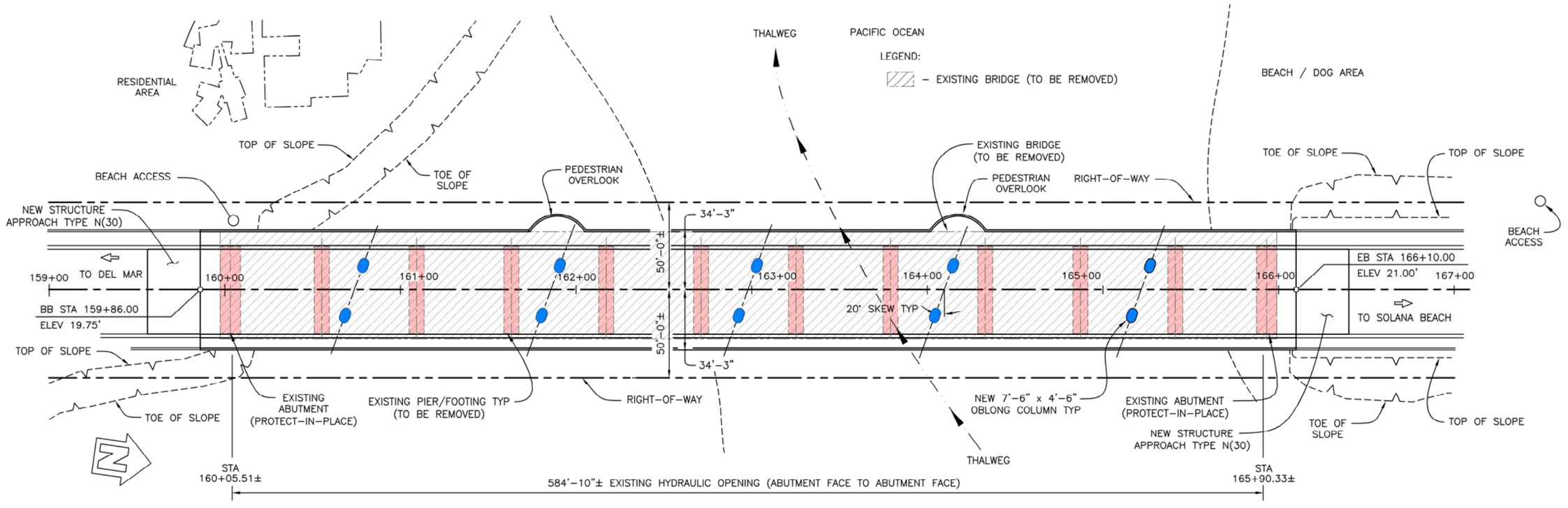
BR-09

ORIGINAL SCALE: 4 0 1 2 INCHES



ELEVATION

1" = 30'–0"



PLAN

1" = 30'–0"

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
11	2,350±

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
5	272

ALTERNATIVE 2.1: 6-SPAN VARIABLE DEPTH CAST-IN-PLACE PRESTRESSED CONCRETE BOX GIRDER BRIDGE WITH TWO COLUMNS PER PIER (BASELINE)

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH

ENGINEER OF WORK | R.C.E. NO. | DATE

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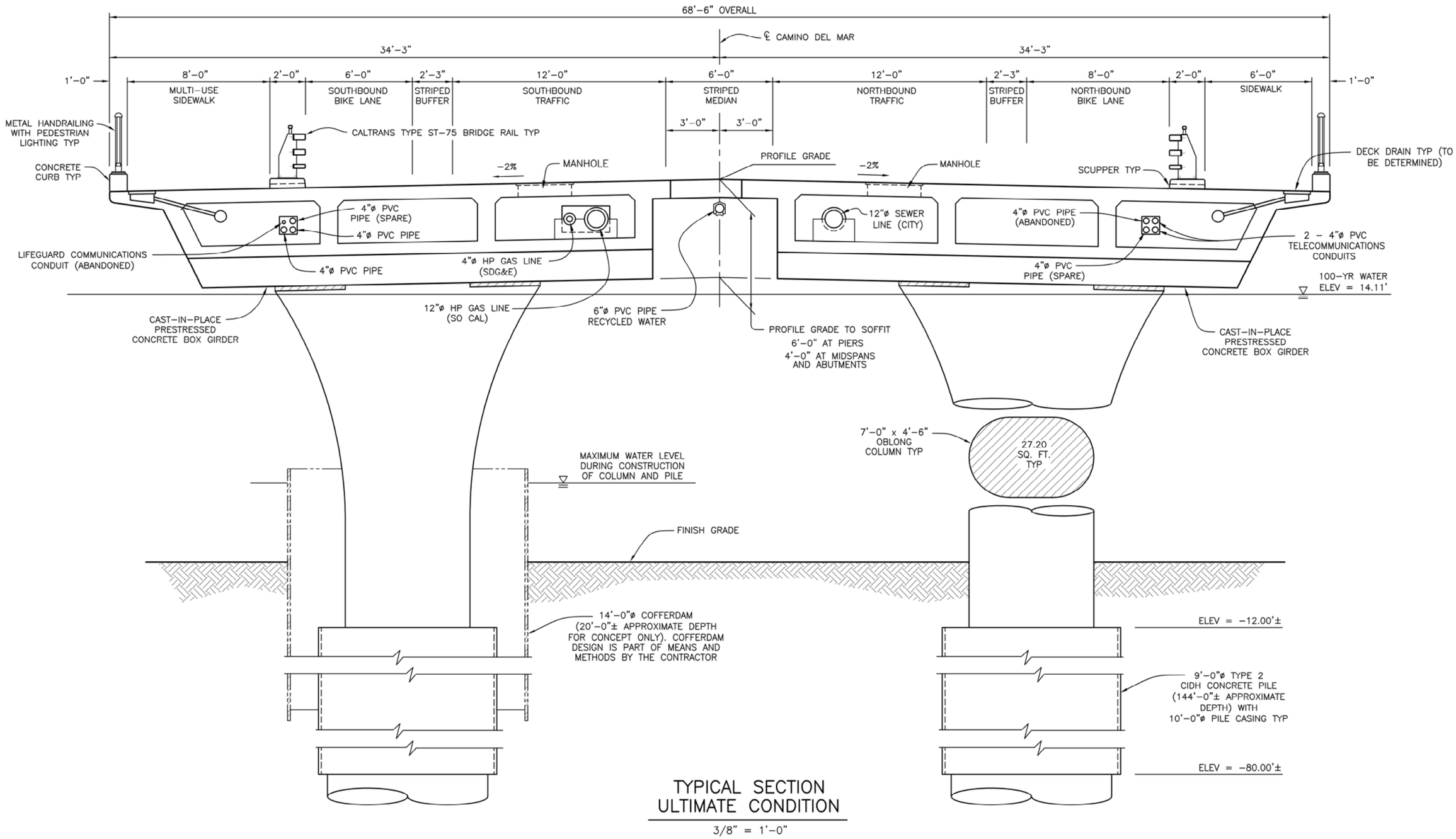
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APPROVED
PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 2.1
GENERAL PLAN (1 OF 2)

BR-10

ORIGINAL SCALE: 0 1/2" 1" 1 1/2" 2" INCHES



TYPICAL SECTION
ULTIMATE CONDITION

3/8" = 1'–0"

ALTERNATIVE 2.1: 6-SPAN VARIABLE DEPTH CAST-IN-PLACE PRESTRESSED CONCRETE BOX GIRDER BRIDGE WITH TWO COLUMNS PER PIER (BASELINE)

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH

ENGINEER OF WORK R.C.E. NO. DATE

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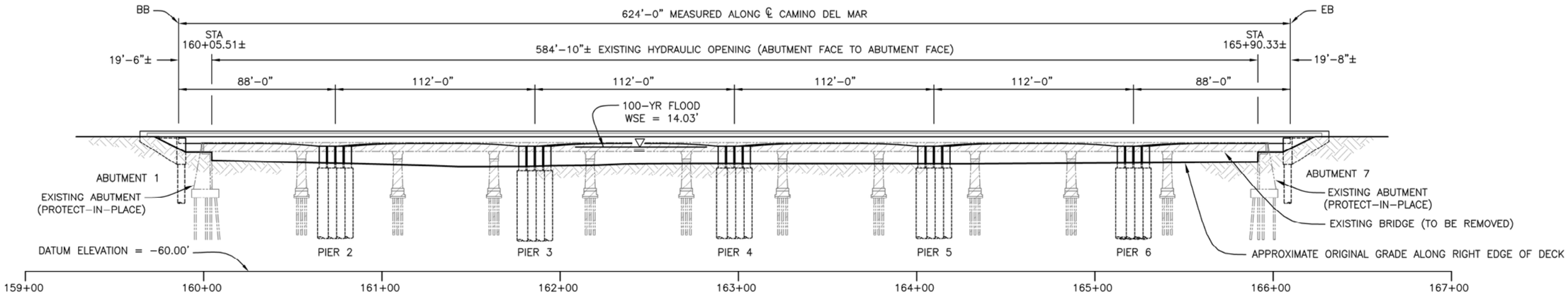
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APPROVED
PUBLIC WORKS DIRECTOR DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 2.1
TYPICAL SECTION

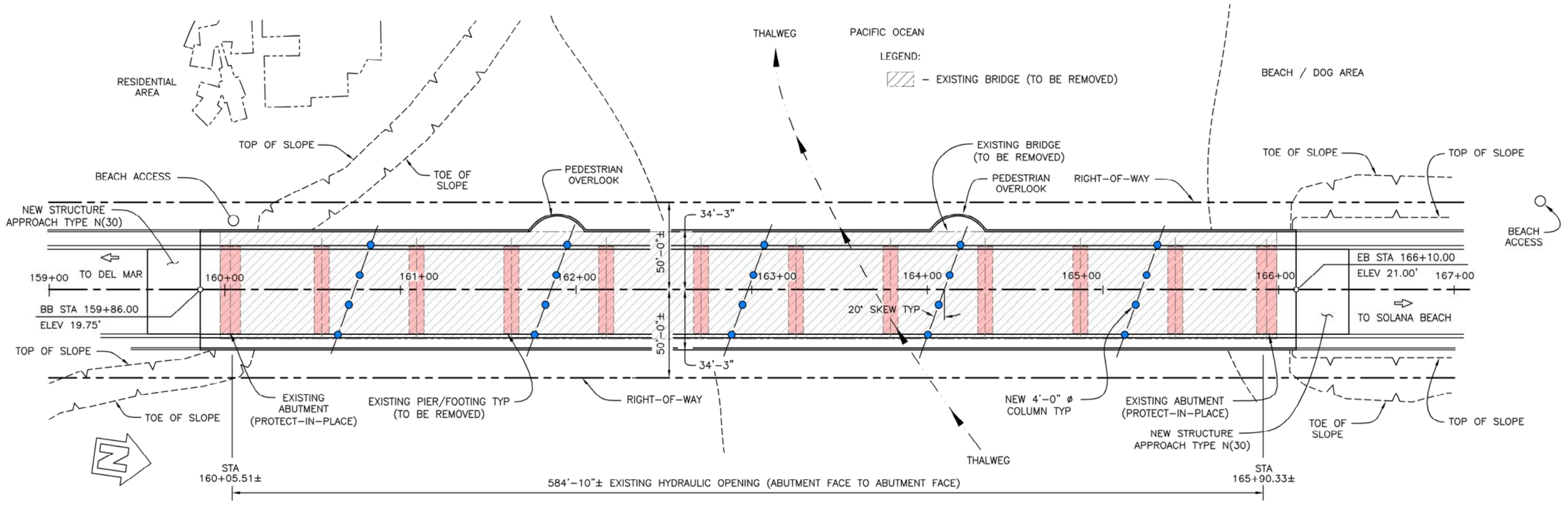
BR-11

ORIGINAL SCALE: 0 1" 2" 3" 4" 5" 6" 7" 8" 9" 10" 11" 12" 13" 14" 15" 16" 17"



ELEVATION

1" = 30'–0"



PLAN

1" = 30'–0"

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
11	2,350±

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
5	272

ALTERNATIVE 2.2: 6-SPAN VARIABLE DEPTH CAST-IN-PLACE PRESTRESSED CONCRETE BOX GIRDER BRIDGE WITH FOUR COLUMNS PER PIER

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH
ENGINEER OF WORK | R.C.E. NO. | DATE

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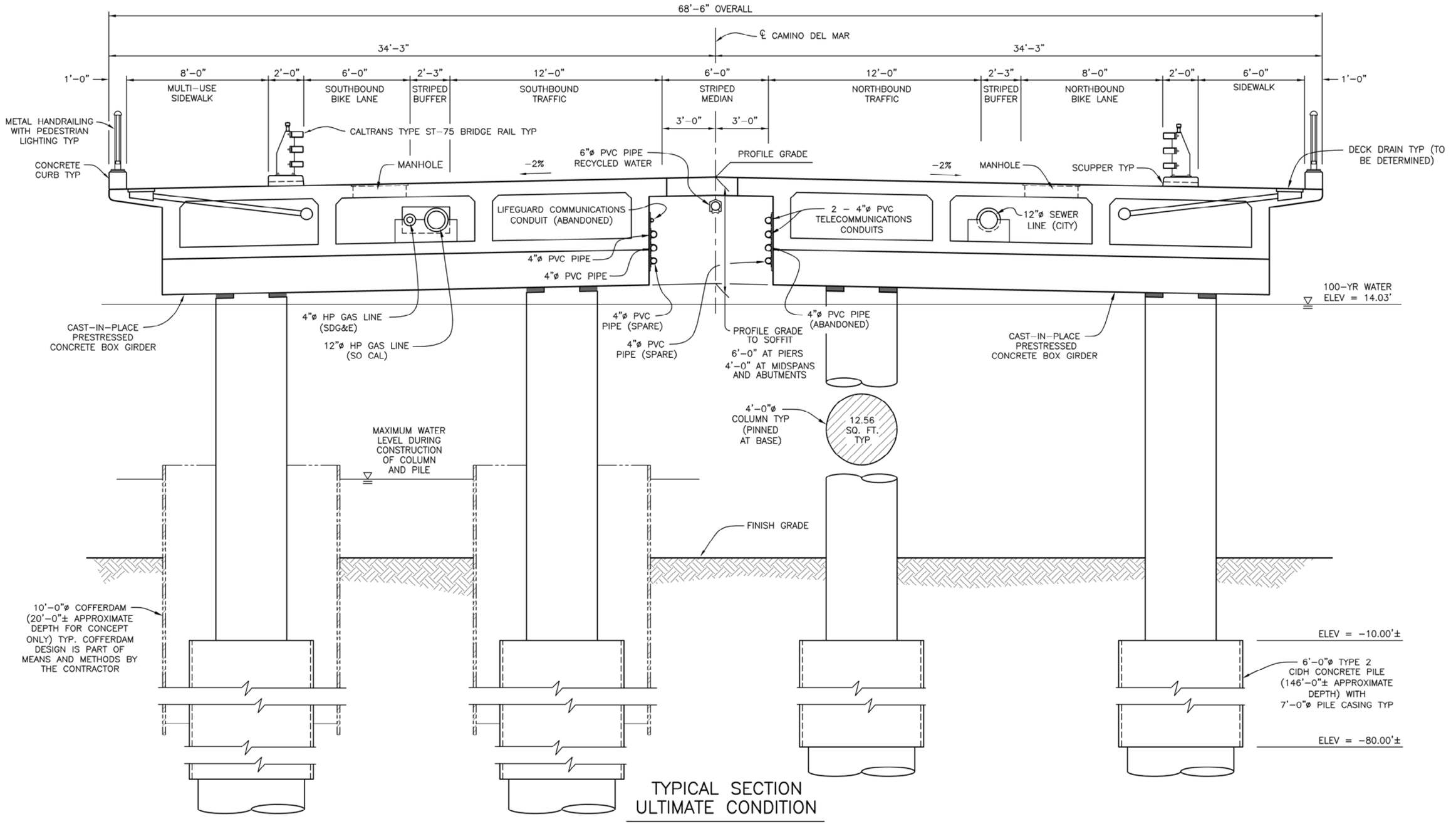
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APPROVED
PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 2.2
GENERAL PLAN (1 OF 2)

BR-12

ORIGINAL SCALE: 0 1/2" 1" 1 1/2" 2" INCHES



TYPICAL SECTION
ULTIMATE CONDITION

3/8" = 1'-0"

ALTERNATIVE 2.2: 6-SPAN VARIABLE DEPTH CAST-IN-PLACE PRESTRESSED CONCRETE BOX GIRDER BRIDGE WITH FOUR COLUMNS PER PIER

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH

ENGINEER OF WORK | R.C.E. NO. | DATE

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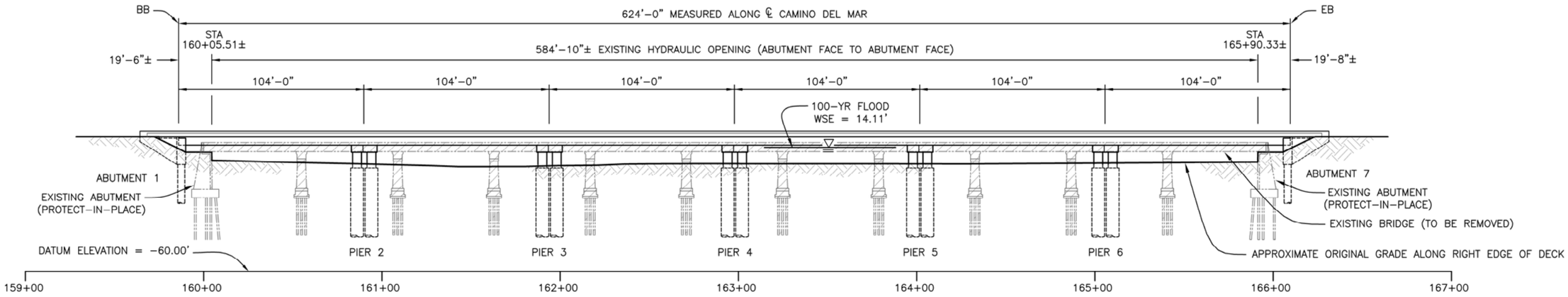
APPROVED

PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 2.2
TYPICAL SECTION

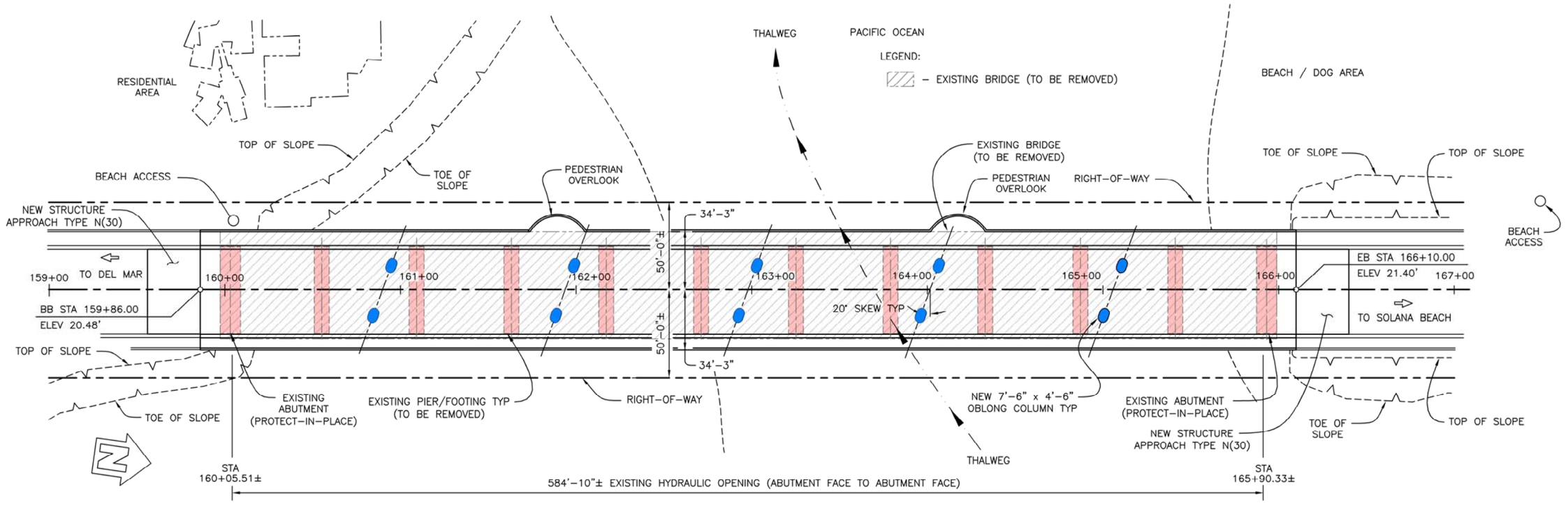
BR-13

ORIGINAL SCALE: 4 INCHES 2 0



ELEVATION

1" = 30'–0"



PLAN

1" = 30'–0"

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
11	2,350±

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
5	272

ALTERNATIVE 9.1: 6-SPAN PRECAST PRESTRESSED CONCRETE WIDE-FLANGE GIRDER BRIDGE WITH TWO COLUMNS PER PIER

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH

ENGINEER OF WORK | R.C.E. NO. | DATE

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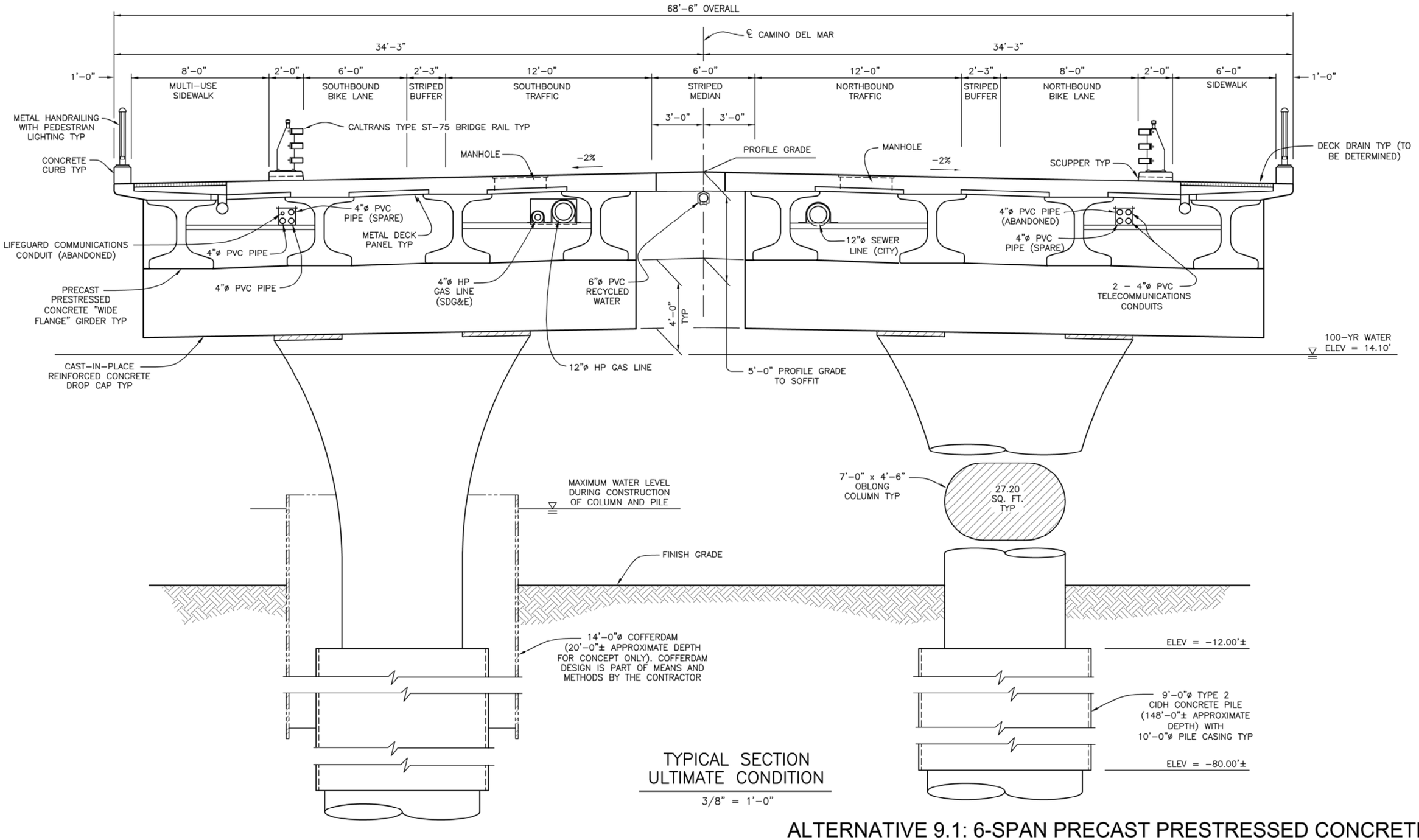
PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR

CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 9.1
GENERAL PLAN (1 OF 2)

BR-14

ORIGINAL SCALE: 0 1" 2" 3" 4" 5" 6" 7" 8" 9" 10" 11" 12" INCHES



TYPICAL SECTION
ULTIMATE CONDITION

3/8" = 1'-0"

ALTERNATIVE 9.1: 6-SPAN PRECAST PRESTRESSED CONCRETE WIDE-FLANGE GIRDER BRIDGE WITH TWO COLUMNS PER PIER

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH

ENGINEER OF WORK | R.C.E. NO. | DATE

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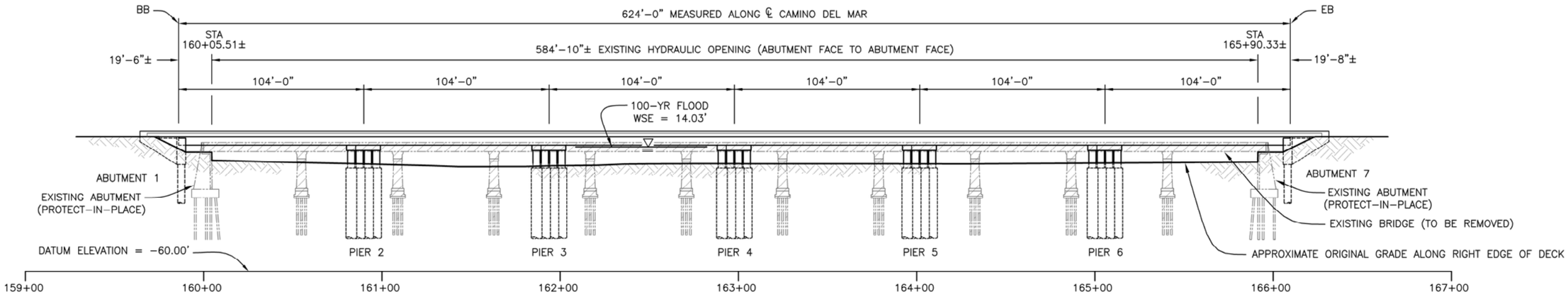
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PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 9.1
GENERAL PLAN (2 OF 2)

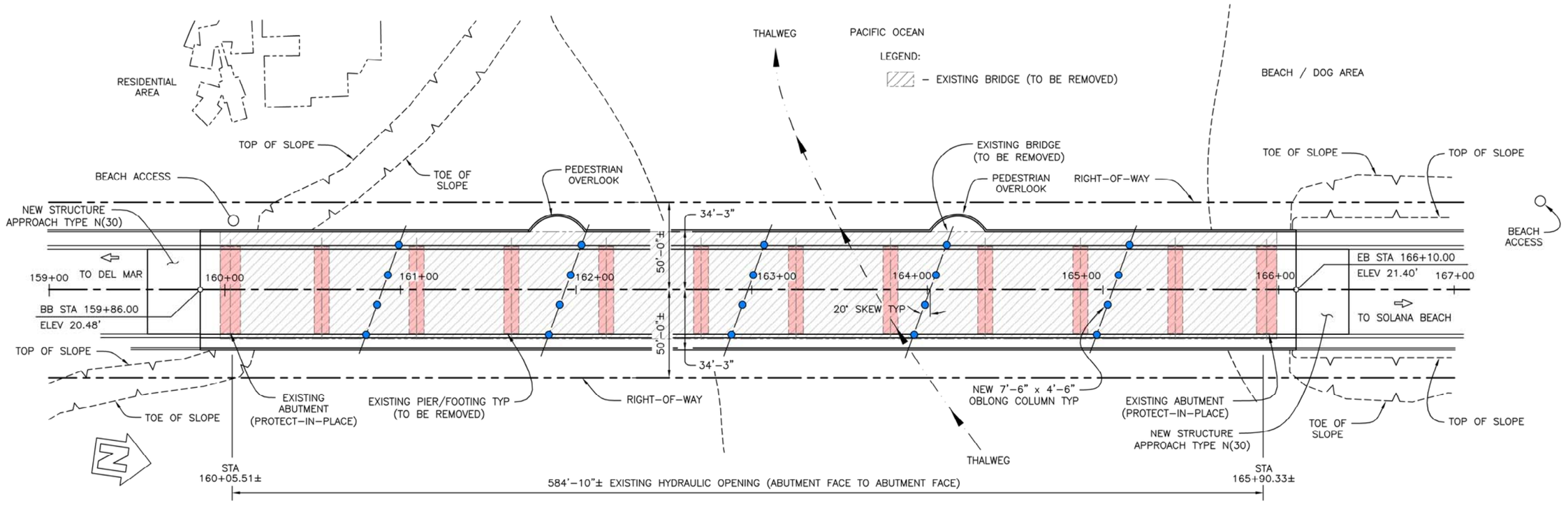
BR-15

ORIGINAL SCALE: 0 1" 2" 3" 4" 5" 6" 7" 8" 9" 10" 11" 12" 13" 14" 15" 16" 17" 18" 19" 20" 21" 22" 23" 24" 25" 26" 27" 28" 29" 30" 31" 32" 33" 34" 35" 36" 37" 38" 39" 40"



ELEVATION

1" = 30'–0"



PLAN

1" = 30'–0"

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
11	2,350±

Number of Spans	Total Permanent Obstruction Area (Sq. Ft.)
5	272

ALTERNATIVE 9.2: 6-SPAN PRECAST PRESTRESSED CONCRETE WIDE-FLANGE GIRDER BRIDGE WITH FOUR COLUMNS PER PIER

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH

ENGINEER OF WORK | R.C.E. NO. | DATE

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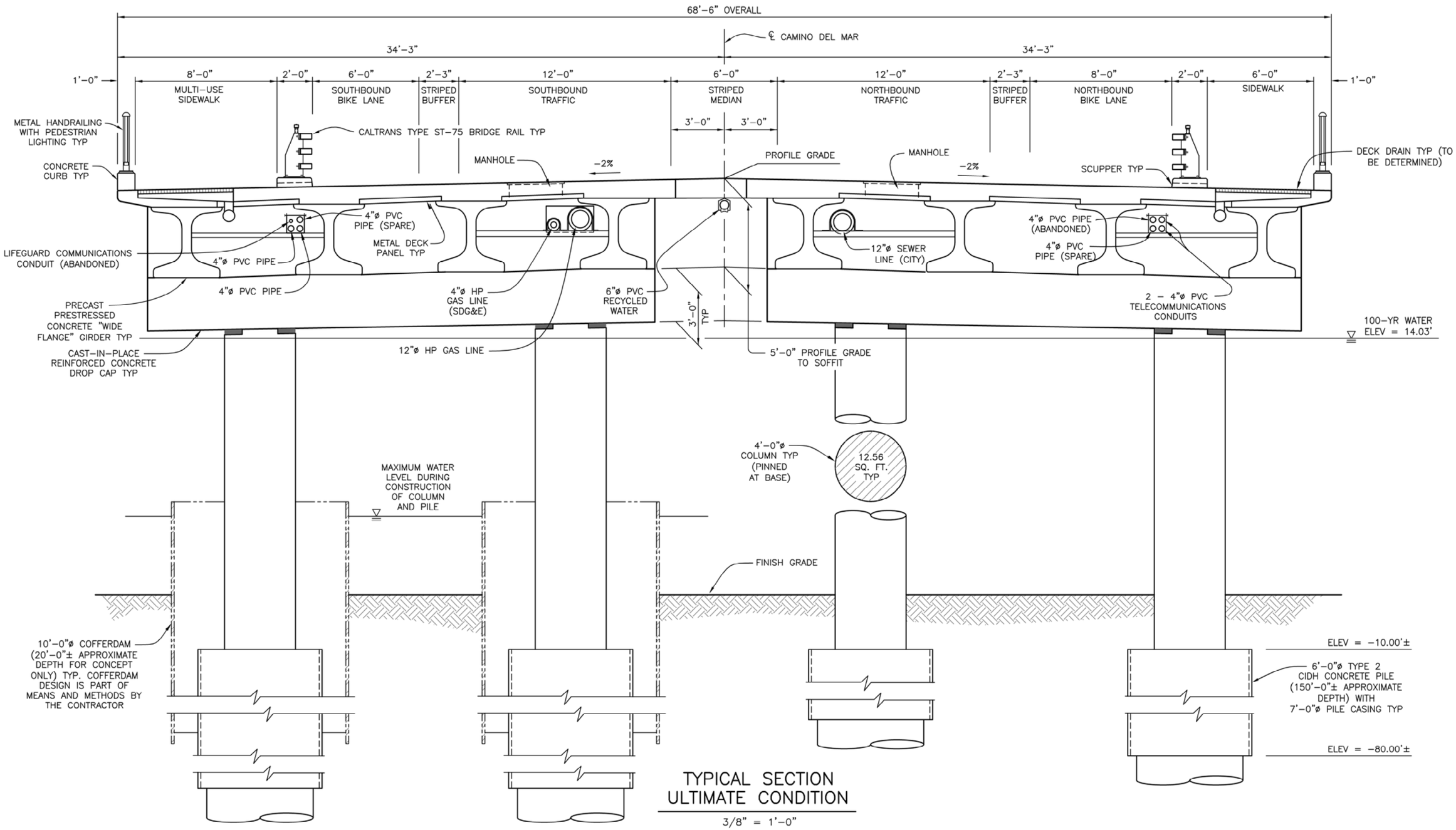
DRAFT

APPROVED
PUBLIC WORKS DIRECTOR | DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 9.2
GENERAL PLAN (1 OF 2)

BR-16

ORIGINAL SCALE: 0 1" 2" 3" 4" INCHES



TYPICAL SECTION
ULTIMATE CONDITION

3/8" = 1'-0"

ALTERNATIVE 9.2: 6-SPAN PRECAST PRESTRESSED CONCRETE WIDE-FLANGE GIRDER BRIDGE WITH FOUR COLUMNS PER PIER

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH

ENGINEER OF WORK R.C.E. NO. DATE

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550 WEST C STREET, SUITE 1200 SAN DIEGO, CA 92101 (619) 831-4600

DRAFT

APPROVED

PUBLIC WORKS DIRECTOR DATE

CITY OF DEL MAR

CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
REPLACEMENT ALTERNATIVE 9.2
GENERAL PLAN (2 OF 2)

BR-17

ORIGINAL SCALE: 0 1/2" 1" 1 1/2" 2" 2 1/2" 3" 3 1/2" 4" INCH

Appendix H

Preliminary Drainage Study



PRELIMINARY DRAINAGE STUDY

BRIDGE NO. 57C-0209
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
Del Mar, California

City of Del Mar Project Tracking: TBD

April 25, 2022

Prepared for:
Kleinfelder
c/o Don Bloodworth
550 West Street, Ste 1200
San Diego, CA 92101

Prepared by:

SAN DIEGUITO ENGINEERING, INC.
Engineering | Surveying | Planning

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SDE Contact Person:
Raymond L Escobar, RCE #72463
SDE Project Number PW5794-04

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DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE COUNTY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

BY: Raymond L Escobar DATE: 4-25-22

Raymond L Escobar

RCE NO.: 72463 EXPIRES: 06/30/2022



SAN DIEGUITO ENGINEERING, INC.
462 STEVENS AVENUE, SUITE 305
SOLANA BEACH, CALIFORNIA 92075
PHONE: (858)345-1149

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Introduction

This drainage study presents an analysis of the effects that the proposed 'Bridge No. 57C-0209- Camino Del Mar Bridge Over San Dieguito River' Project may have on the *quantity* and *pattern* of storm water runoff in the local watershed. Storm water *quality* is addressed in the Green Streets PDP Exempt SWQMP for the project, under separate cover from this document.

This study examines the existing and proposed hydrology of the site and nearby watershed and presents preliminary design engineering recommendations for the project drainage facilities.

Section 1 – Project Information

This section describes the location, activities, and hydrologic setting (watershed, topography, land use, soils and vegetation, drainage patterns, and impervious cover) of the project site.

1.1 Project Description

1.1.1 Project Location

The project site is located within the City of Del Mar, California along Camino Del Mar south of Via De La Valle and north of Sandy Lane. Exhibit A provides a vicinity map for the site.

1.1.2 Project Activities Description

This project will replace the existing bridge structure crossing the San Dieguito River along Camino Del Mar. This crossing is located immediately east of the river's discharge into the Pacific Ocean. The improvements will include related work at the approaches including the reconstruction of inlets and facilities for pollution control as detailed in the project stormwater treatment document (Green Streets PDP Exempt SWQMP).

1.2 Hydrologic Setting

This section summarizes the project's size and location in context of the larger watershed perspective, topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, and other relevant hydrologic and environmental factors specific to the project area's watershed.

The project site is located at the downstream end of the 345-square mile San Dieguito Watershed. It is more specifically located within the Solana Beach Hydrologic Area (905.1). The project area accounts for approximately 0.156 percent of the local San Dieguito watershed area. Exhibit B illustrates the project site in the context of the watershed.

1.2.1 Topography

The project site is situated in the seaside City of Del Mar in San Diego County. The site consists of the existing roadway (Camino del Mar) which is flat and slopes towards the south with an approximate grade of 0.33%. The road has a normal crown and drains from a raised median towards the exterior curb. The elevation difference across the site is about 3 feet from an elevation of 19' MSL to 16' MSL.

1.2.2 Current and Adjacent Land Use

The project site is currently a two-lane roadway including a bike lane each way. The western edge of the bridge also includes a boardwalk for pedestrians. The roadway includes parking lanes on the west and east sides immediately upstream and downstream of the existing bridge crossing.

Exhibit C illustrates the County of San Diego General Plan and Zoning near the project site.

1.2.3 Soil and Vegetation Conditions

The NRCS Web Soil Survey by the United States Department of Agriculture Soil Conservation Service was used for reference in determining the preliminary soil conditions at the site and surrounding areas. In general, the areas north of the bridge consist of tidal flats (type D) soils while the areas south of the bridge were Tujunga sand (type A) soils.

At this preliminary phase, infiltration testing has not been performed. Therefore, infiltration rates have not been determined. Based on the proposed design of the new bridge, drainage from the project will be directed towards two sump inlets on the north side of the bridge. Soils in this location are estimated to consist of type D soil with estimated infiltration rate between 0 – 0.025 inches per hour per the San Diego County BMP Design Manual.

The vegetation within the area is sparse along the median and roadside with small pockets of bushes and seagrass.

1.2.4 Existing Drainage Patterns and Facilities

The project site consisting of the Camino Del Mar roadway drains towards each side of the road and is then channeled south along the curb. Runoff north of the is collected prior to draining on to bridge. Flows on the eastern side of the road are collected by inlet and emptied into the San Dieguito lagoon. The flows from the western side of the road drain overland to the west and collected by a grated inlet then conveyed west and discharged over rip rap into the Pacific Ocean. Runoff from the bridge continues south along Camino Del Mar before getting collected by existing inlets in the vicinity of 28th and 29th Street.

1.2.5 Floodplain Mapping

The Federal Emergency Management Agency (FEMA) has mapped Special Flood Hazard Areas (SFHAs) for the project site. The project site is within an area on the FEMA Flood Insurance Rate Map designated as Regulatory Floodway with a Base Flood Elevation of approximately 12 feet. FIRM Map Number 06073C1307G is included in Exhibit E.

1.2.6 Downstream Conditions

The area immediately downstream of the bridge consist of medium to dense residential development with some small amount of office commercial. Flooding was evidenced at the inlet located at the southwest corner of the intersection of 29th Street and along the east side of Camino del Mar after moderate rain events.

1.2.7 Impervious Cover

The project study has concrete pavement and asphalt roadway pavement throughout the majority of the project area. The project will increase the amount of imperviousness by approximately 6,700 square feet. The increase can be attributed to the replacement and widening of the bridge structure as well as the required associated roadway transition.

Section 2 – Methodology and Design Criteria

This section summarizes the design criteria and methodology applied during drainage analysis of the project site. The design criteria and methodology follow the County of San Diego County Hydrology Manual (SDCHM) (June 2003) and the San Diego County Hydraulic Design Manual (September 2014) as appropriate for the project site.

2.1 Rational Method

Peak flows for this site were calculated using methodology in the SDCHM for the rational method utilizing the Advanced Engineering Software (AES-2016). These calculations were performed for both the existing and proposed conditions to quantify differences in peak rate of discharges. Runoff coefficients were weighted and based on Table 3-1 of the SDCHM. Time of concentration was calculated per Section 3.1.4 of the SDCHM and the corresponding runoff intensities for the 100-year storm were based upon a 6-hour precipitation of 2.45 inches. The 100-year (6 hour and 24 hour) isopluvials are located in Appendix A as well as the Pre-project and Post-project rational method hydrology calculations.

Though an increase in peak runoff rates is shown from the existing to developed condition for the proposed project, mitigation is not necessary since the project affected drainage areas will discharge directly into either the San Dieguito River or the Pacific Ocean. That is, the increase in runoff will have a negligible effect on the water surface elevations of the San Dieguito River due to its close proximity to the Pacific Ocean. Additionally, rip rap placed at the proposed pipe discharge points will help dissipate energy to below erosive levels. Appendix C contains a summary table of the rip needed at each pipe discharge point.

2.2 Hydraulic calculations (inlets/storm drain)

Preliminary inlet size calculations for the new curb inlets along Camino Del Mar have been included in this study and are included in Appendix B. Sizing of the inlets were performed per the San Diego County Hydraulic Design Manual for inlets located in a sag and on continuous grade. Preliminary hydraulic calculations for storm drain conveyances are included in the hydrologic model in Appendix A based on preliminary pipe diameters, invert elevations, and lengths.

Section 3 – Hydrologic Effect of Project

This section summarizes the quantities and location of storm water runoff from the project site. Discussion of the water quality aspects of the project can be found in the Green Streets PDP Exempt SWQMP prepared under separate cover from this report.

3.1 Drainage Patterns

The proposed project will slightly revise the existing condition drainage pattern but will have a negligible impact. As discussed in Section 1.2.4 above, the existing drainage patterns will change slightly with the proposed bridge improvements. A high point within the bridge section now creates a ridge line and will reverse the runoff direction on the northern section of the bridge compared to existing condition. Associated road improvements north of the bridge will also be required for transitioning the road to the new bridge. This includes sidewalk transitions and curb inlets placed at the newly created sump where the existing road meets the new pavement improvements.

Drainage flow length to the southern end of the bridge will be shortened due to the revised elevated bridge profile. Hydrologic analysis on the proposed improvements will determine the peak flows draining towards the area south of the new bridge and determine its impact due to widening and elevating the bridge.

3.2 Impervious Cover

The proposed imperviousness makeup of the site will conceptually remain the same as in existing condition. That is, the bridge will be reconstructed along the same alignment although with an increase width of about 7.5'. The overall width will increase from 61'-1" to 68'-6".

3.3 Peak Runoff

Rational Method 100-year hydrologic models for the existing and proposed conditions were performed to determine the project's impact relative to existing conditions. The existing and proposed condition models for the areas draining towards the south originally extended to the existing inlets. However, calculations indicated that, although the inlets would now receive runoff flows from a smaller tributary area, the peak flows increased. This occurred due to elevating the bridge which steepened the road slope and shortening the time of concentration. Therefore, to more accurately determine the flow increase attributable to the actual improvements, the models were revised to conclude at the south end of the bridge improvements. Table 3-1 on the next page summarizes the hydrologic effects for the project's drainage subareas. Nodes shown on the table correspond to the drainage inlet or discharge points depicted on the pre- and post-development hydrology maps in Appendix A.

Table 3-1 Summary of Hydrology Analysis

Location	Node	A (acre)	Q_{100} (cfs)
Existing- North of Bridge (existing DI#5)	22	0.34	1.60
Existing- North of Bridge (existing DI#4)	32	0.20	0.76
Existing- North of Bridge (existing DI#3)	12	0.58	2.48
Existing- South of Bridge (East)	42	0.87	2.21
Existing- South of Bridge (West)	52	0.66	1.86
Cumulative Existing		2.65	8.91
Post-North of Bridge (existing DI#5)	122	0.58	2.86
Post-North of Bridge (existing DI#4)	128	0.26	1.33
Post-North of Bridge (existing DI#3)	117	0.86	4.46
Post- South of Bridge (East, immediately south of abutment)	142	0.34	1.89
Post- South of Bridge (West, immediately south of abutment)	152	0.33	1.86
Post-South of Bridge (East, south end of improvements)	146	0.27	1.04
Post-South of Bridge (West, south end of improvements)	156	0.17	0.78
Cumulative Post-project		2.81	14.22
Difference		+0.16	+5.31

As indicated in the table above, peak flows from the proposed bridge improvements will result in an unmitigated peak flow increase of about 5.31 cfs. It should be noted, as previously mentioned, that although the drainage area flowing to the south end of the bridge decreased, the respective flow runoff experienced a slight cumulative increase of about 1.5 cfs for the combined (east and west) sides of the road. The area south of the bridge currently experiences flooding conditions. Therefore, two new inlets are proposed to collect runoff from the east and west sides of the street immediately south of the southern abutment. These inlets will collect bridge runoff and discharge at the San Dieguito River rather than be allowed to gutter flow towards the existing southern downstream inlets along Camino del Mar. This will serve to reduce the peak flow draining towards the existing inlet and help alleviate some of the flooding which currently occurs.

Per the table above, the project would directly discharge 12.4 cfs of runoff into the San Dieguito River where it meets the Pacific Ocean. This is an increase of 7.56 cfs compared to 4.84 cfs in existing conditions. Per the *Hydraulic and Sediment Transport Analyses for the Camino Del Mar Bridge Replacement (Alternatives 1.1, 2.1, and 9.2)* prepared by Wayne W. Chang (June 4, 2020), the Q100 peak flow within the San Dieguito River at the proposed bridge location is 41,800 cfs. Therefore, the overall peak flow increase of 7.56 cfs due to the project would represent an increase of less than 0.018%. In addition, the

site's location relative to the overall San Dieguito River means that the peak flows from the site and river will not coincide due to their vastly different lag times. That is, introduction of the site's peak flow runoff in to the river will not add to the rivers overall peak since it will arrive much sooner than the rivers peak flow. For this reason, mitigation of peak flow increases due to the project are not necessary or proposed.

3.4 Project Erosion and Sedimentation

Because runoff from the site will be over non-erodible surfaces from the roadway and sidewalks or will discharge at points with outlet protection such as rip rap energy dissipation, neither erosion or sedimentation are anticipated since velocities at runoff discharge points will be reduced to non-erosive levels.

Section 4 – Summary and Conclusions

This section provides a summary discussion of the potential effects of the proposed project on local water resources in terms of quantity and location.

- The proposed project will alter drainage directions relative to existing condition. This area diversion will, in turn, create a peak flow increase to the proposed condition discharge points north of the bridge. A small runoff increase was also determined at the south end of the bridge. However, the hydrologic impact from these increases will be insignificant since the site will discharge into the San Dieguito River where it empties to the Pacific Ocean. The peak flow increase will have a negligible effect on the water surface elevation within the San Dieguito River.
- The project will remove or replace existing drainage improvements and all storm drainage pipes and new facilities will be designed to convey the 100-year peak flows without causing flooding of proposed structure.

Section 5 – References

County of San Diego Department of Public Works Flood Control (June 2003). San Diego County Hydrology Manual.

County of San Diego Department of Public Works Flood Control Section (September 2014). San Diego County Hydraulic Design Manual.

County of San Diego Department of Public Works Flood Control Section (July 2005). San Diego County Drainage Design Manual.

Soil Conservation Service (December 1973). Soil Survey, San Diego Area, California.

Exhibit A

Vicinity Map

Vicinity Map



February 15, 2022

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

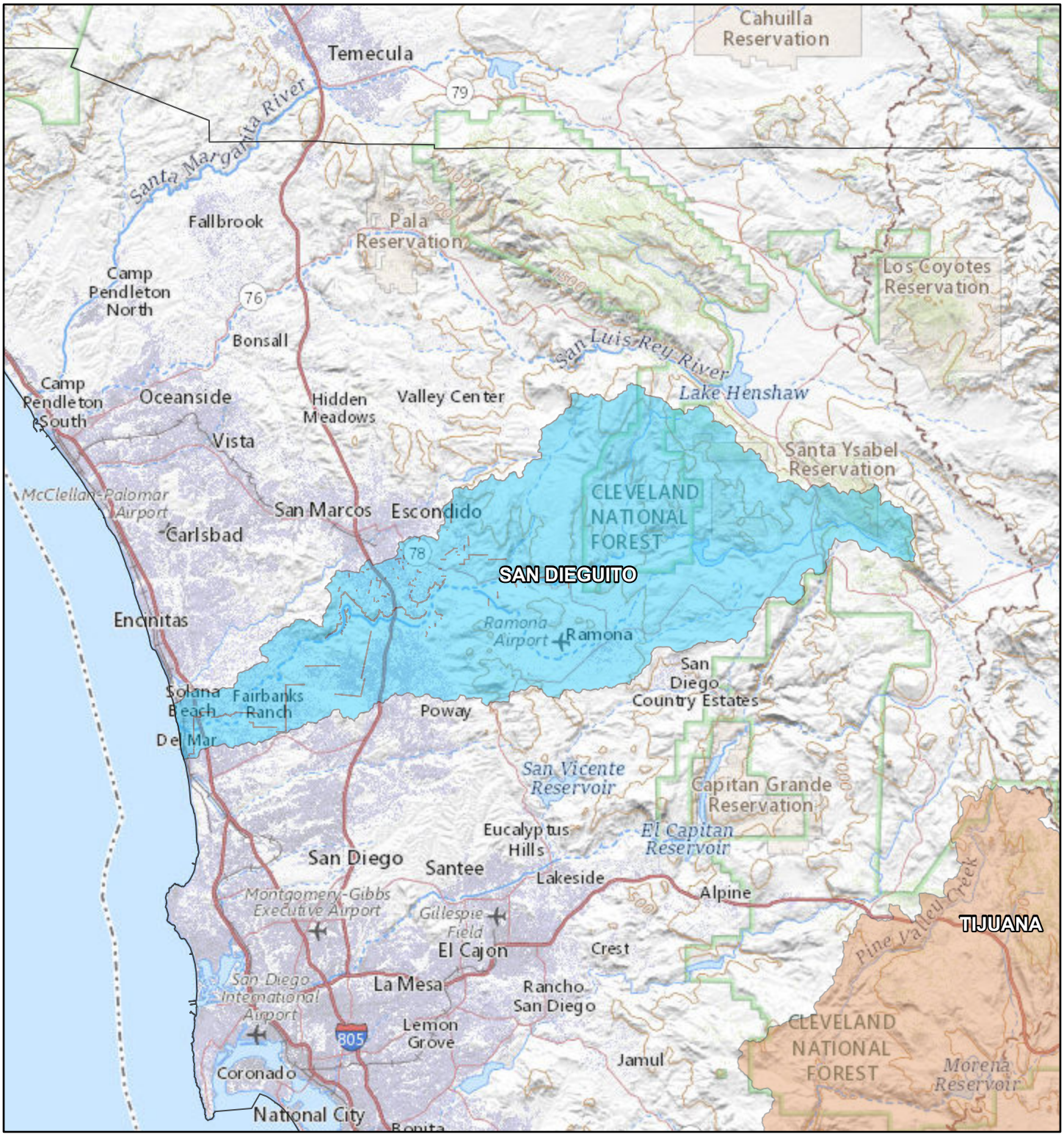
Figure 1. Vicity Map- Camino del Mar Bridge Over San Dieguito River

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census

Exhibit B

Watershed Vicinity Map

San Dieguito Watershed



February 11, 2022

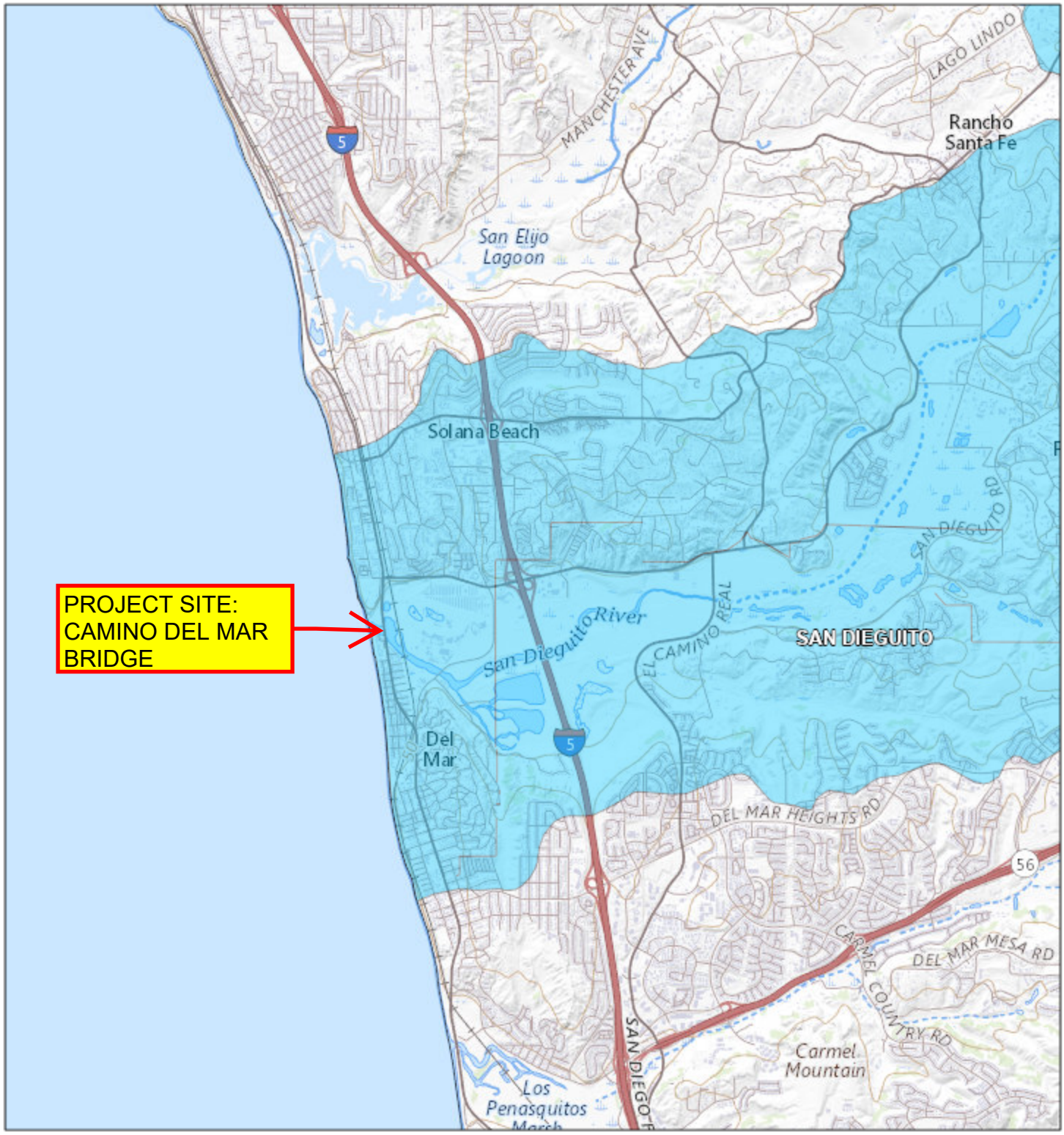
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0 4 8 16 mi

0 5 10 20 km

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census

San Dieguito Watershed



February 11, 2022

1:72,224

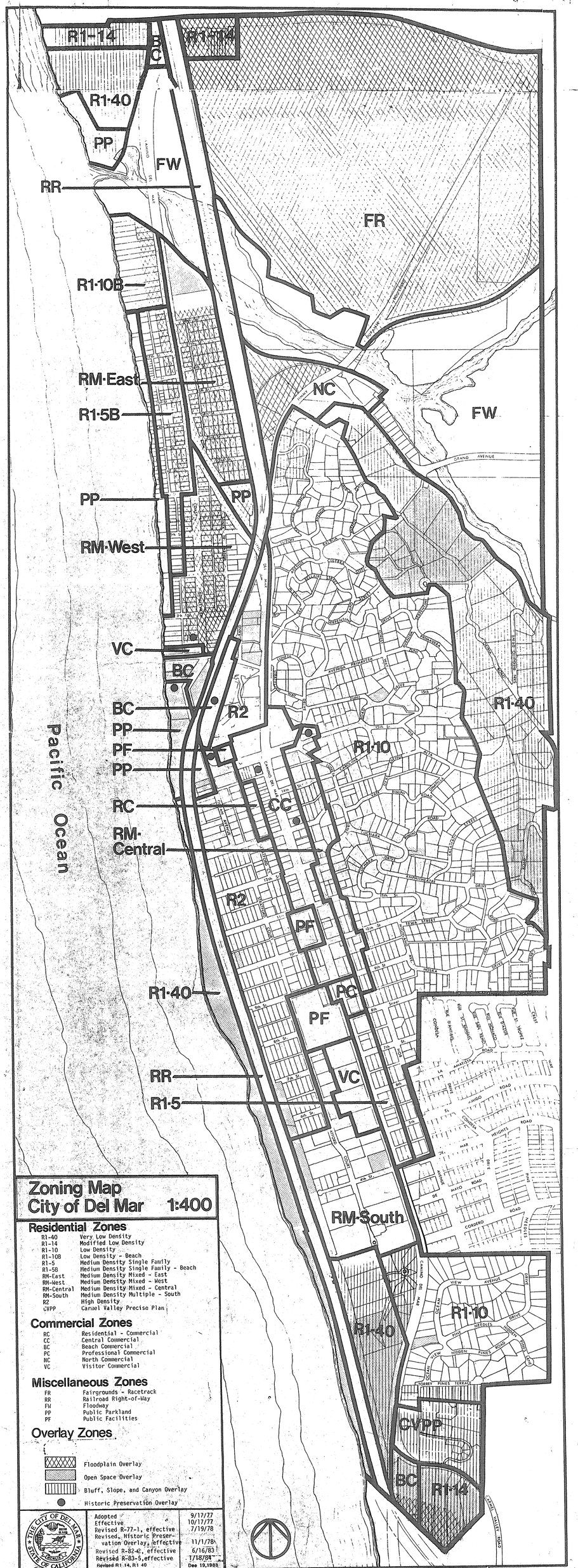
0 0.5 1 2 mi

0 0.75 1.5 3 km

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census

Exhibit C

County General Plan Land Use/Zoning Map


R1-14
R1-14
R1-40
PP
FW
RR
FR
R1-10B
RM-East
R1-5B
NC
FW
PP
PP
RM-West
VC
BC
BC
R2
PP
PF
PP
RC
CC
RM-Central
R2
PF
R1-40
PC
PF
VC
RR
R1-5
RM-South
R1-40
R1-10
CVPP
BC
R1-14
R1-40
R1-10
Pacific Ocean
GRAND AVENUE
CAMINO DEL MAR
CAMINO DEL MAR
CAMINO DEL MAR

****NOTE:** The City has made every effort to ensure this maps accuracy. Please contact the City of Del Mar Planning Department regarding detailed zoning information and overlay zones. 858-755-9313 Counter Hours: 1pm - 5pm Monday-Friday

City of Del Mar
ZONING MAP

Residential Zones

- R1-40 Very Low Density
- R1-14 Modified Low Density
- R1-10 Low Density
- R1-10B Low Density - Beach
- R1-15 Medium Density Single Family
- R1-15B Medium Density Single Family - Beach
- RM - East Medium Density Mixed - East
- RM-West Medium Density Mixed - West
- RM-Central Medium Density Mixed - Central
- RM-South Medium Density Multiple - South
- R2 High Density
- CVPP Carmel Valley Precise Plan

Commercial Zones

- RC Residential - Commercial
- CC Central Commercial
- BC Beach Commercial
- PC Professional Commercial
- NC North Commercial
- VC Visitor Commercial

Miscellaneous Zones

- FR Fairgrounds - Racetrack
- RR Railroad Right-of-Way
- FW Floodway
- PP Public Parkland
- PF Public Facilities
- PSP Plaza Specific Plan
- HSP Hotel Specific Plan

0 1000 2000 3000 Feet

SANDAG

San Diego's Regional Planning Agency

November 2001

N

1:19585

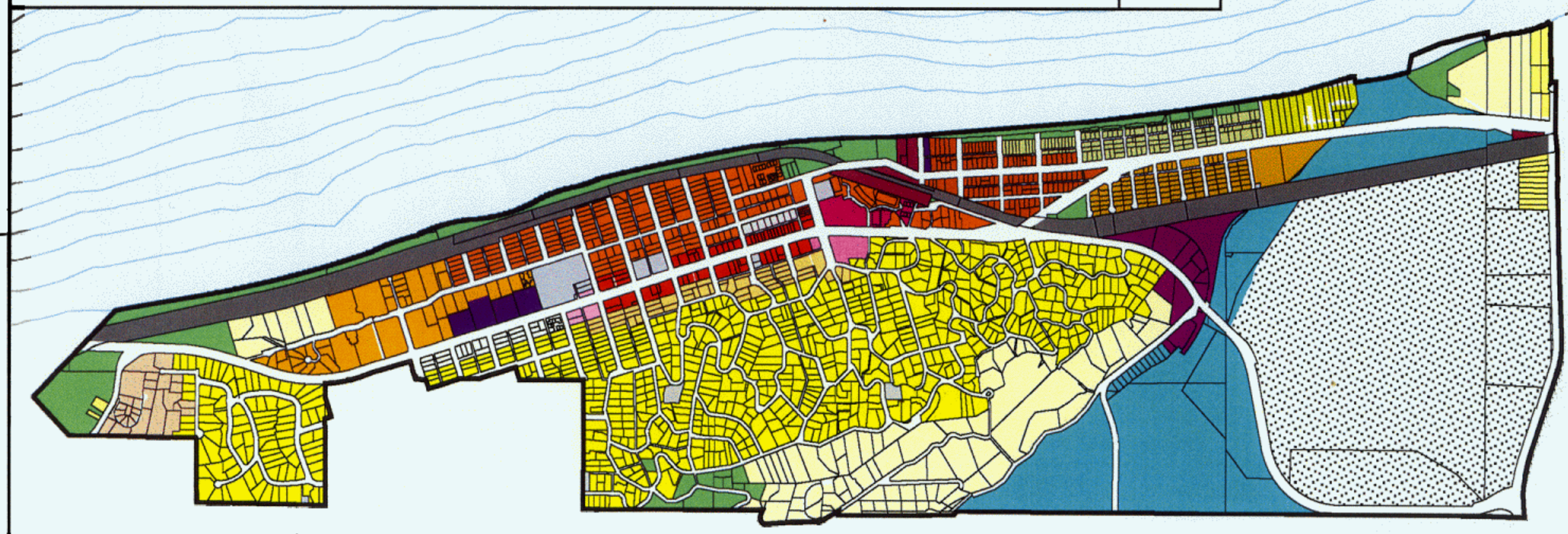


Exhibit D

Soil Types

Hydrologic Soil Group—San Diego County Area, California
(Camino Del Mar)



Map Scale: 1:3,710 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 13, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 3, 2014—Nov 22, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
LG-W	Lagoon water		5.8	39.5%
Md	Made land		0.3	1.7%
MlC	Marina loamy coarse sand, 2 to 9 percent slopes	B	0.2	1.1%
TeF	Terrace escarpments		1.0	7.1%
Tf	Tidal flats	D	4.8	32.7%
TuB	Tujunga sand, 0 to 5 percent slopes	A	2.6	17.9%
Totals for Area of Interest			**14.7**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

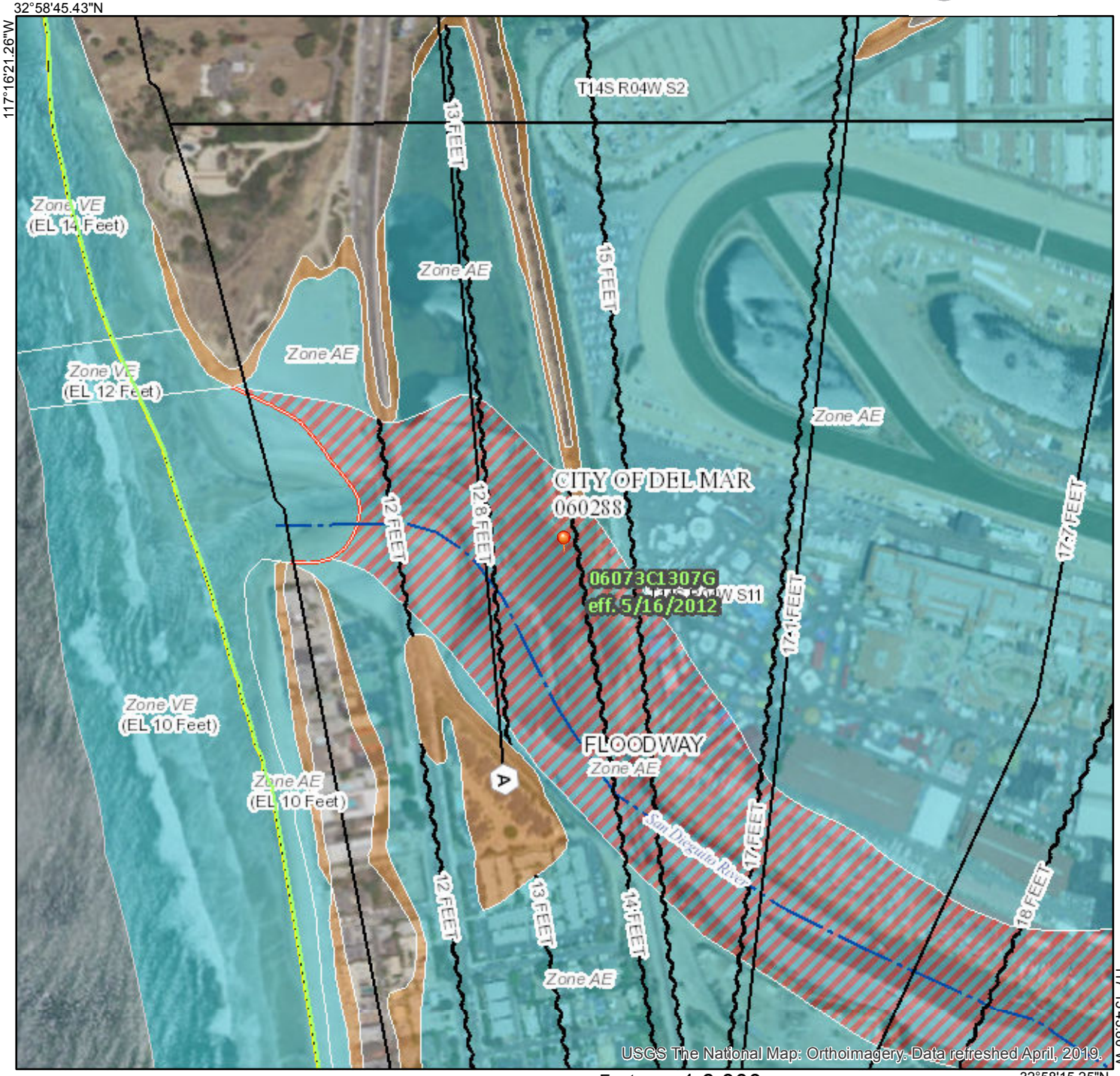
Tie-break Rule: Higher

Exhibit E

FEMA Flood Insurance Rate Map

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/14/2019 at 6:07:55 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix A

Hydrology Manual Excerpts

Isopluvial Maps – 100-Year 6-Hour & 24-Hour

Hydrology Maps

Rational Method Calculations

Hydrology Manual Excerpts

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

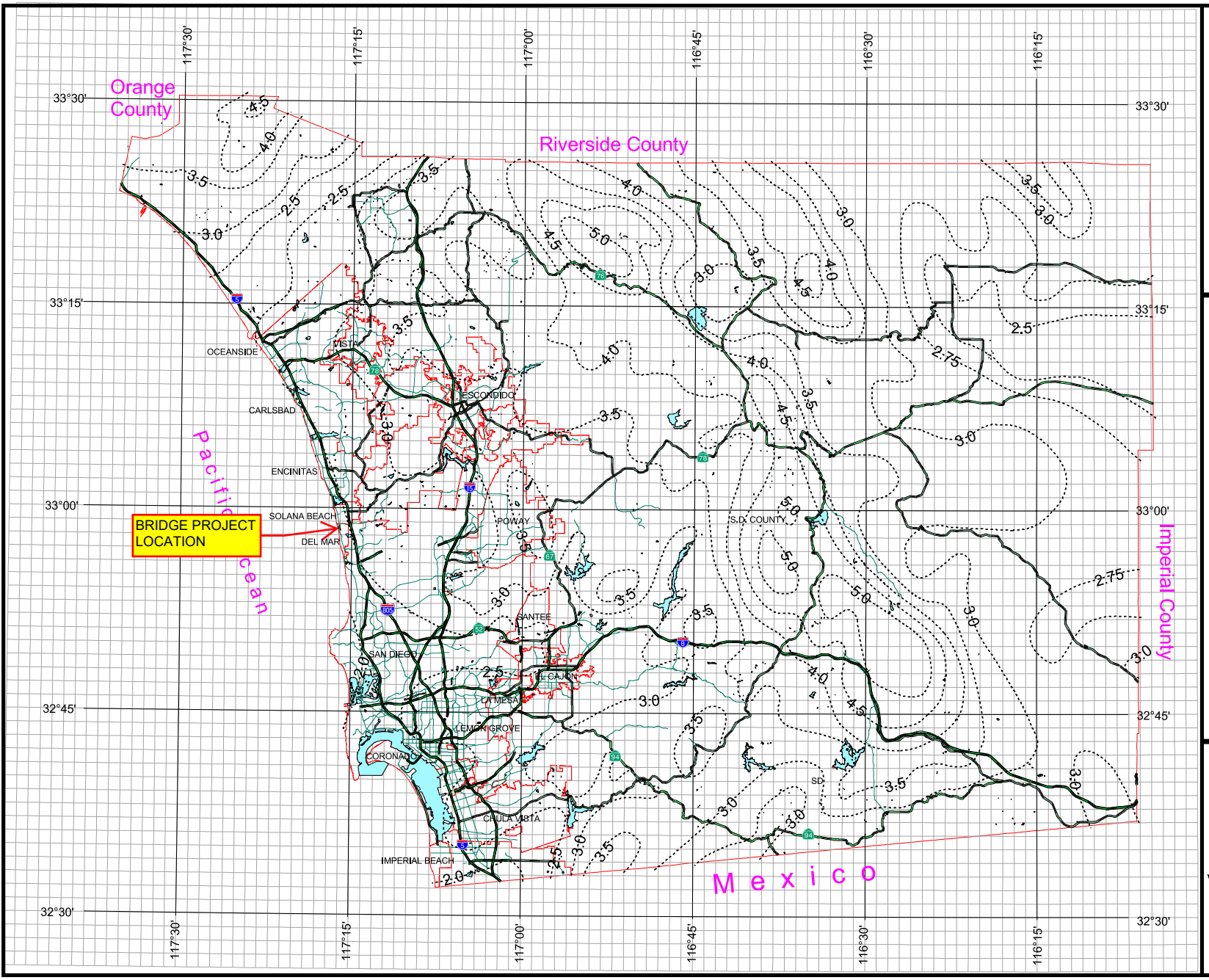
MAXIMUM OVERLAND FLOW LENGTH (L_M)
& INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

*See Table 3-1 for more detailed description

Isopluvial Maps – 100-Year 6-Hour & 24-Hour

Camino del Mar Bridge, Bridge No. 57C-0209



County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

100-YR, P6 = 2.45 IN

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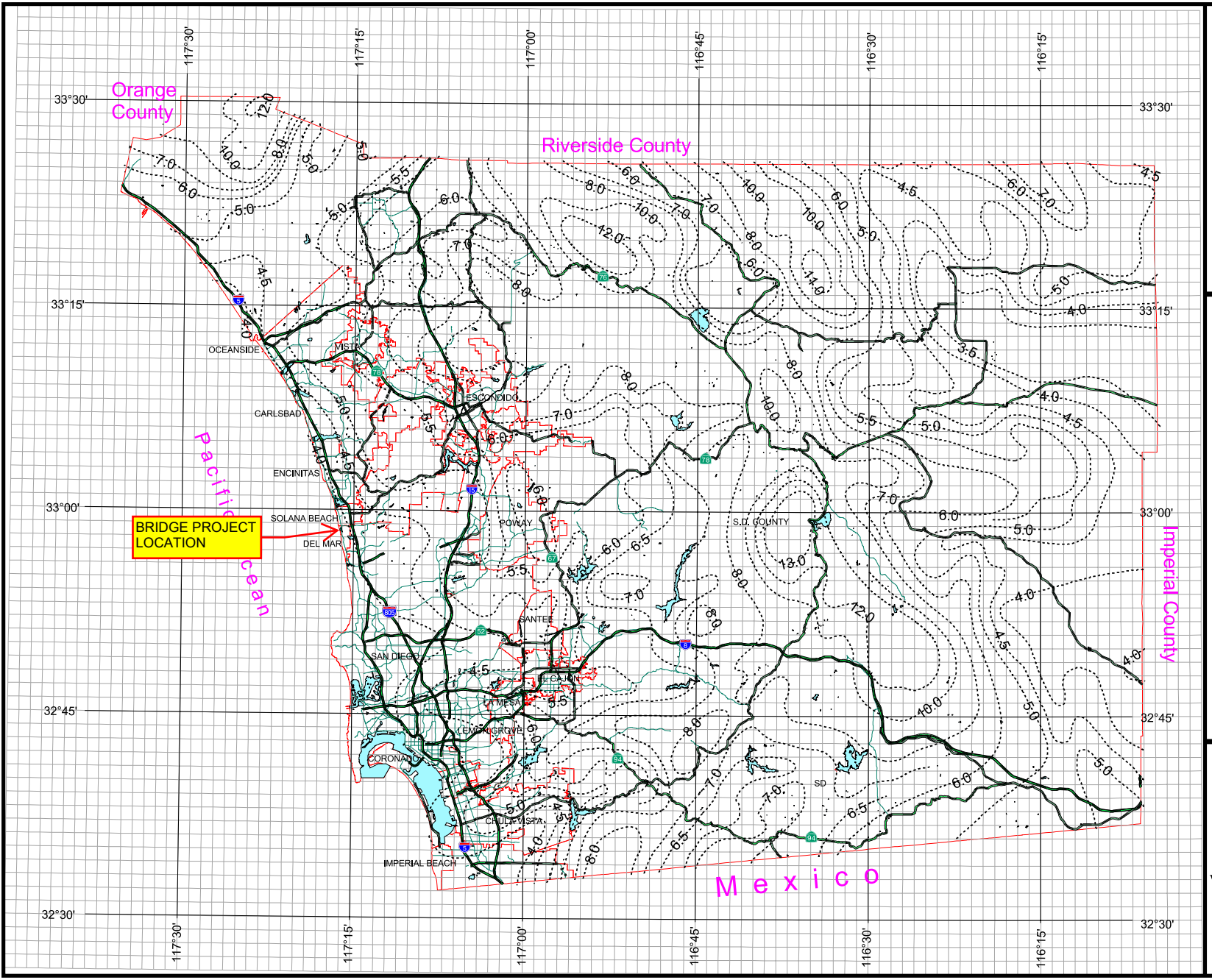
3 0 3 Miles

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Camino del Mar Bridge, Bridge No. 57C-0209



County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

100-YR, P24 = 3.9 IN

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Department of Public Works
Geographic Information Services

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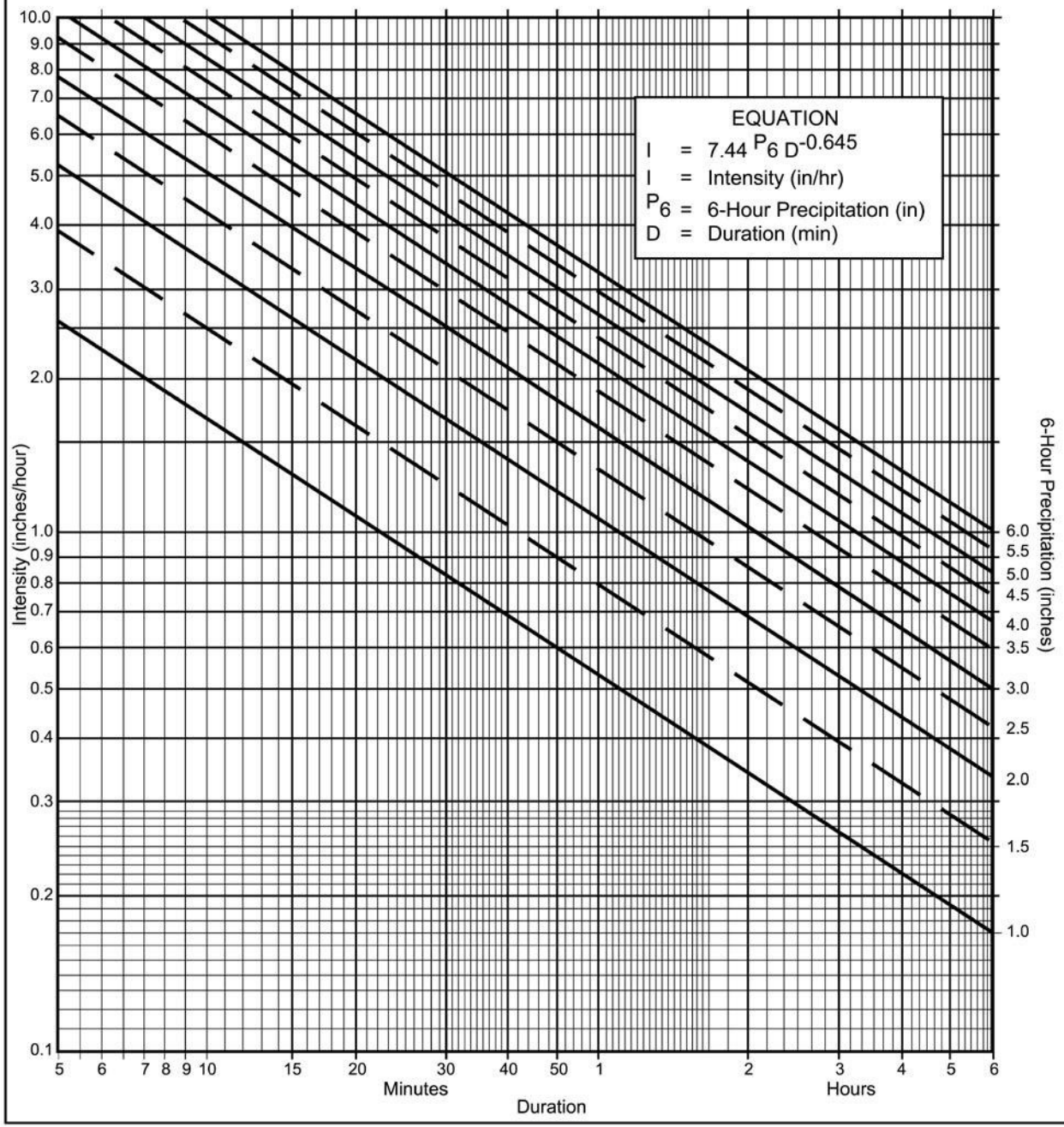
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3 0 3 Miles



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 100 year

(b) P_6 = 2.45 in., P_{24} = 3.9, $\frac{P_6}{P_{24}}$ = 62.8 %(2)

(c) Adjusted P_6(2) = 2.45 in.

(d) t_x = _____ min.

(e) I = _____ in./hr.

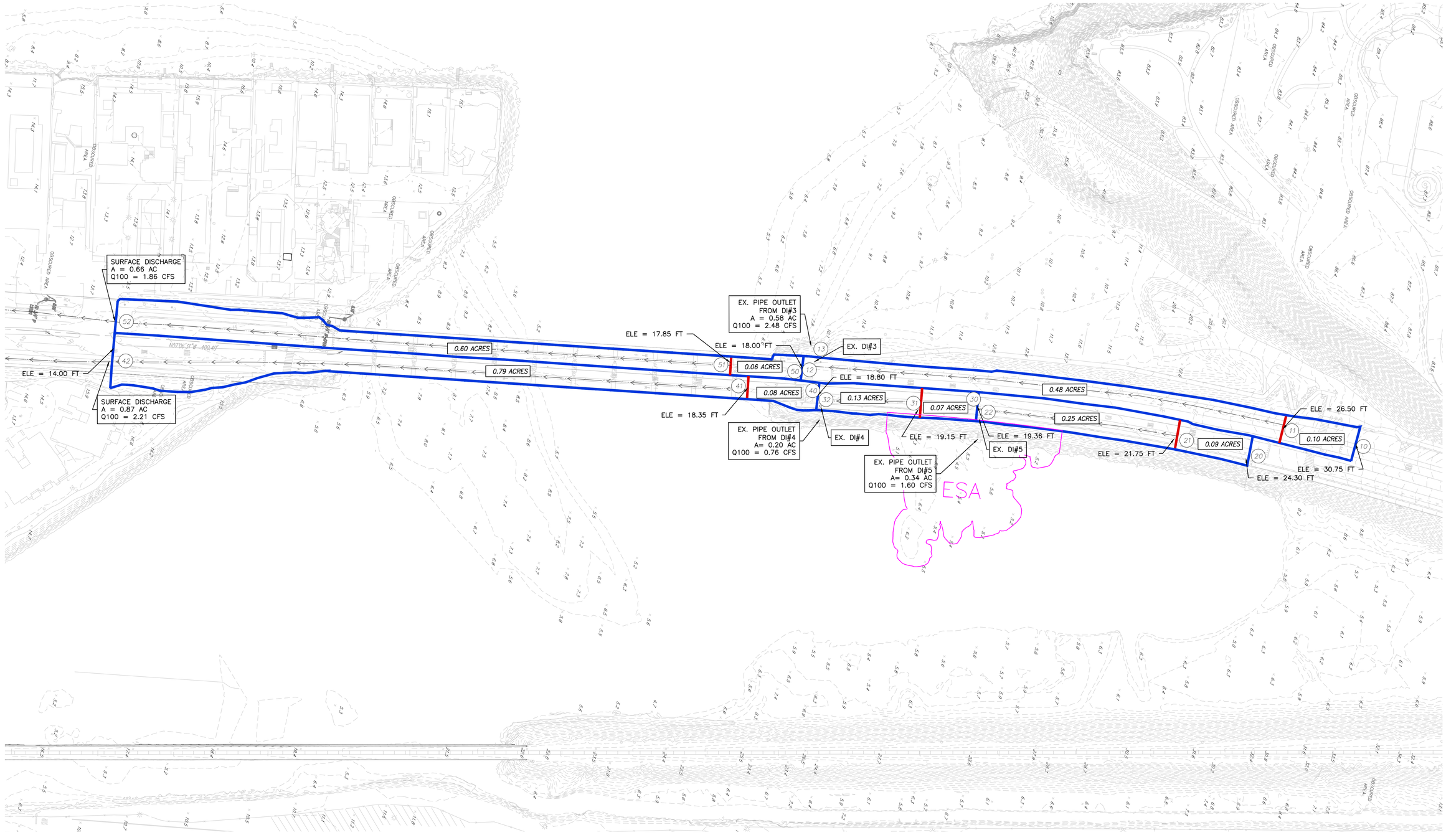
Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1

Hydrology Maps



LEGEND

WATERSHED BOUNDARY	
DRAINAGE BOUNDARY	
INITIAL SUBAREA	
DRAINAGE FLOWPATH	
MODEL NODE #	
SUBAREA ACREAGE	1.31 ACRES

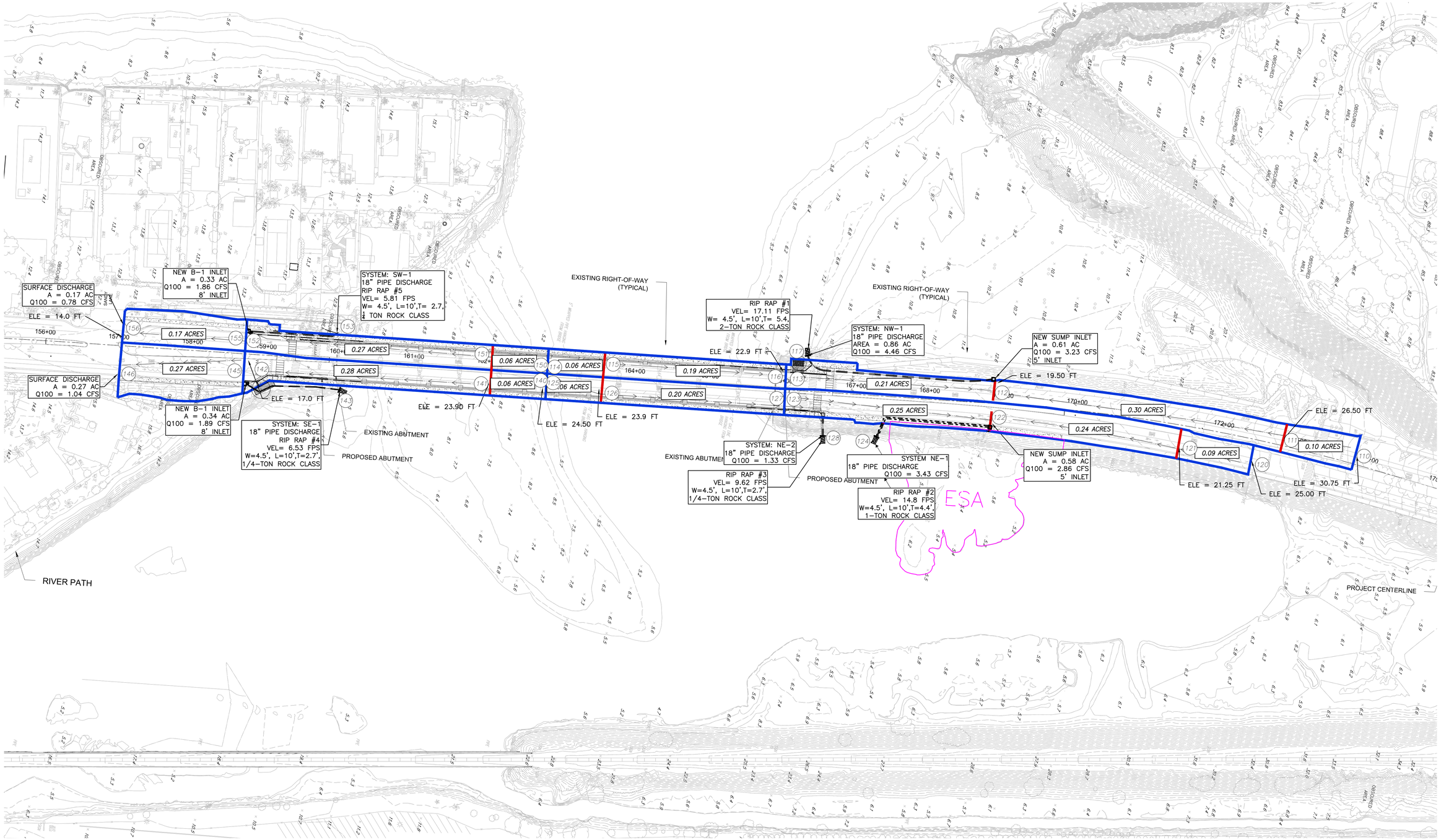
CAMINO DEL MAR BRIDGE
EXISTING CONDITION HYDROLOGY MAP

60 30 0 60 120

SCALE: 1" = 60'

EXISTING CONDITION HYDROLOGY MAP

SAN DIEGUITO ENGINEERING, INC
462 STEVENS AVE. Ste. 305
SOLANA BEACH, CA
92075-2066
PHONE: (858) 345-1149
www.sdeinc.com
CIVIL ENGINEERING • PLANNING
LAND SURVEYING



CAMINO DEL MAR BRIDGE
PROPOSED CONDITION HYDROLOGY MAP

LEGEND

- DRAINAGE BOUNDARY
- INITIAL SUBAREA
- DRAINAGE FLOWPATH
- MODEL NODE #
- SUBAREA ACREAGE — xx ACRES

60 30 0 60 120

SCALE: 1" = 60'

EXISTING CONDITION HYDROLOGY MAP

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Rational Method Calculations

Q100- Existing Condition Model

PW5794.04- Camino del Mar Bridge, Del Mar
Runoff Coefficient Determination

Existing Condition																		
Upstream Node	Downstream Node	Impervious (road, roofs, sidewalk)		Bldg		Landscape		Natural		Total Driveway	Driveway w/o Pavers		Pavers		Σ(a x c)	Total Subarea		Runoff Coeff per SDCHM
		sf	C-coeff	sf	c-coeff	sf	c-coeff	sf	c-coeff	sf	sf	c-coeff	sf	c-coeff		sf	ac	
10	11	3,719	0.90	0	0.90	580	0.35	0	0.35	0	0.00	0.90	0	0.35	3550	4299	0.10	0.83
11	12	20,214	0.90	0	0.90	672	0.35	0	0.35	0	0.00	0.90	0	0.35	18428	20886	0.48	0.88
20	21	3,327	0.90	0	0.90	549	0.35	0	0.35	0	0.00	0.90	0	0.35	3186	3876	0.09	0.82
21	22	8,946	0.90	0	0.90	2,160	0.35	0	0.35	0	0.00	0.90	0	0.35	8807	11106	0.25	0.79
30	31	2,290	0.90	0	0.90	705	0.35	0	0.35	0	0.00	0.90	0	0.35	2308	2995	0.07	0.77
31	32	4,131	0.90	0	0.90	1,363	0.35	0	0.35	0	0.00	0.90	0	0.35	4195	5494	0.13	0.76
40	41	2,617	0.90	0	0.90	692	0.35	0	0.35	0	0.00	0.90	0	0.35	2598	3309	0.08	0.78
41	42	26,172	0.90	0	0.90	8,108	0.35	0	0.35	0	0.00	0.90	0	0.35	26393	34280	0.79	0.77
50	51	2,356	0.90	0	0.90	335	0.35	0	0.35	0	0.00	0.90	0	0.35	2238	2691	0.06	0.83
51	52	22,418	0.90	0	0.90	3,513	0.35	0	0.35	0	0.00	0.90	0	0.35	21406	25931	0.60	0.83
		96,190		0		18,677		0		0	0		0			114867	2.64	

Q100- Existing Condition Model

```
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1690

                          Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* CAMINO DEL MAR BRIDGE                                                 *
* 100-YEAR HYDROLOGIC ANALYSIS- EXISTING CONDITION                      *
* PW5794.04                                                             *
 ************************************************************************

  FILE NAME: C:\AES\PW5794\EX100.DAT
  TIME/DATE OF STUDY: 14:07 04/24/2022
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.450
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   28.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0160
  2   20.0     15.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0160

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  0.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =     30.75
  DOWNSTREAM ELEVATION(FEET) =     26.50
  ELEVATION DIFFERENCE(FEET) =      4.25
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.787
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    86.25
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.455
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.54

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STANDARD CURB SECTION USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =   26.50  DOWNSTREAM ELEVATION(FEET) =   18.00
  STREET LENGTH(FEET) =   651.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  11.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.59
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.70
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.24
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.63
  STREET FLOW TRAVEL TIME(MIN.) =   4.85   Tc(MIN.) =    7.63
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.914
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.871
  SUBAREA AREA(ACRES) =    0.48      SUBAREA RUNOFF(CFS) =    2.08
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       2.48

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.40
  FLOW VELOCITY(FEET/SEC.) =  2.48   DEPTH*VELOCITY(FT*FT/SEC.) =   0.78
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =     751.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =     24.30
  DOWNSTREAM ELEVATION(FEET) =     21.75
  ELEVATION DIFFERENCE(FEET) =      2.55
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.206
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.50
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.455
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.48

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   21.75  DOWNSTREAM ELEVATION(FEET) =   19.36
  STREET LENGTH(FEET) =   270.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  14.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.06
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.92
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.78
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.47
  STREET FLOW TRAVEL TIME(MIN.) =   2.53   Tc(MIN.) =    5.74
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.906
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.798
  SUBAREA AREA(ACRES) =    0.25      SUBAREA RUNOFF(CFS) =    1.17
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       1.60

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.38
  FLOW VELOCITY(FEET/SEC.) =  1.95   DEPTH*VELOCITY(FT*FT/SEC.) =   0.57
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE     22.00 =     370.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     31.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =     19.36
  DOWNSTREAM ELEVATION(FEET) =     19.15
  ELEVATION DIFFERENCE(FEET) =      0.21
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.292
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.223
  SUBAREA RUNOFF(CFS) =      0.34
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.34

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     32.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   19.15  DOWNSTREAM ELEVATION(FEET) =   18.80
  STREET LENGTH(FEET) =   130.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 26.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  13.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.58
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.94
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    0.97
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.26
  STREET FLOW TRAVEL TIME(MIN.) =   2.23   Tc(MIN.) =    7.52
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.959
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.764
  SUBAREA AREA(ACRES) =    0.13      SUBAREA RUNOFF(CFS) =    0.49
  TOTAL AREA(ACRES) =        0.2        PEAK FLOW RATE(CFS) =       0.76

  END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.83
  FLOW VELOCITY(FEET/SEC.) =  1.03   DEPTH*VELOCITY(FT*FT/SEC.) =   0.29
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     32.00 =     205.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7800
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =     18.80
  DOWNSTREAM ELEVATION(FEET) =     18.35
  ELEVATION DIFFERENCE(FEET) =      0.45
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.925
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    52.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.455
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     42.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   18.35  DOWNSTREAM ELEVATION(FEET) =   14.00
  STREET LENGTH(FEET) =   852.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  15.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.45
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.31
    HALFSTREET FLOOD WIDTH(FEET) =    9.12
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.47
  STREET FLOW TRAVEL TIME(MIN.) =   9.28   Tc(MIN.) =   14.21
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.292
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.771
  SUBAREA AREA(ACRES) =    0.79      SUBAREA RUNOFF(CFS) =    2.00
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       2.21

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.91
  FLOW VELOCITY(FEET/SEC.) =  1.69   DEPTH*VELOCITY(FT*FT/SEC.) =   0.58
  LONGEST FLOWPATH FROM NODE     40.00 TO NODE     42.00 =     927.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     51.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =     18.50
  DOWNSTREAM ELEVATION(FEET) =     18.00
```

```
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.063
  WARNING:  INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    53.33
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.455
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.32
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.32

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     52.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   18.00  DOWNSTREAM ELEVATION(FEET) =   14.00
  STREET LENGTH(FEET) =   820.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  15.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.21
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.49
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.44
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.43
  STREET FLOW TRAVEL TIME(MIN.) =   9.50   Tc(MIN.) =   13.56
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.391
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.830
  SUBAREA AREA(ACRES) =    0.60      SUBAREA RUNOFF(CFS) =    1.69
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       1.86

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.23
  FLOW VELOCITY(FEET/SEC.) =  1.60   DEPTH*VELOCITY(FT*FT/SEC.) =   0.53
  LONGEST FLOWPATH FROM NODE     50.00 TO NODE     52.00 =     895.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.7  TC(MIN.) =     13.56
  PEAK FLOW RATE(CFS)   =       1.86
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Q100- Proposed Condition Model

PW5794.04- Camino del Mar Bridge, Del Mar
Runoff Coefficient Determination

Proposed Condition																		
Upstream Node	Downstream Node	Sidewalk/Road/ Driveway		Bldg		Landscape		Natural		Total Driveway	Driveway Area w/o Pavers		Pavers		Σ(a x c)	Total Subarea		Runoff Coeff per SDCHM
		sf	C-coeff	sf	c-coeff	sf	c-coeff	sf	c-coeff	sf	sf	c-coeff	sf	c-coeff		sf	ac	
110	111	3,719	0.90	0	0.90	580	0.35	0	0.35	0	0	0.90	0	0.35	3550	4299	0.10	0.83
111	112	12,677	0.90	0	0.90	470	0.35	0	0.35	0	0	0.90	0	0.35	11574	13147	0.30	0.88
113	112	9,137	0.90	0	0.90	106	0.35	0	0.35	0	0	0.90	0	0.35	8260	9243	0.21	0.89
114	115	2,577	0.90	0	0.90	0	0.35	0	0.35	0	0	0.90	0	0.35	2319	2577	0.06	0.90
115	116	8,267	0.90	0	0.90	0	0.35	0	0.35	0	0	0.90	0	0.35	7440	8267	0.19	0.90
120	121	3,327	0.90	0	0.90	549	0.35	0	0.35	0	0	0.90	0	0.35	3186	3876	0.09	0.82
121	122	8,479	0.90	0	0.90	2,027	0.35	0	0.35	0	0	0.90	0	0.35	8341	10506	0.24	0.79
123	122	8,634	0.90	0	0.90	2,227	0.35	0	0.35	0	0	0.90	0	0.35	8550	10861	0.25	0.79
125	126	2,623	0.90	0	0.90	0	0.35	0	0.35	0	0	0.90	0	0.35	2361	2623	0.06	0.90
126	127	8,661	0.90	0	0.90	0	0.35	0	0.35	0	0	0.90	0	0.35	7795	8661	0.20	0.90
140	141	2,617	0.90	0	0.90	0	0.35	0	0.35	0	0	0.90	0	0.35	2355	2617	0.06	0.90
141	142	11,285	0.90	0	0.90	784	0.35	0	0.35	0	0	0.90	0	0.35	10431	12069	0.28	0.86
150	151	2,562	0.90	0	0.90	0	0.35	0	0.35	0	0	0.90	0	0.35	2306	2562	0.06	0.90
151	152	11,174	0.90	0	0.90	511	0.35	0	0.35	0	0	0.90	0	0.35	10235	11685	0.27	0.88
145	146	6,101	0.90	0	0.90	5,549	0.35	0	0.35	0	0	0.90	0	0.35	7433	11650	0.27	0.64
155	156	4,933	0.90	0	0.90	2,640	0.35	0	0.35	0	0	0.90	0	0.35	5364	7573	0.17	0.71
		106,773		0		15,443		0		0	0		0			122216	2.81	

Q100- Proposed Condition Model

```
******************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1690

                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* CAMINO DEL MAR BRIDGE                                                 *
* 100-YEAR HYDROLOGIC ANALYSIS- PROPOSED CONDITION                      *
* PW5794.04                                                             *
 ************************************************************************

  FILE NAME: C:\AES\PW5794\PR100.DAT
  TIME/DATE OF STUDY: 14:03 04/24/2022
------------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.450
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   28.0     20.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0160
  2   20.0     15.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0160

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  0.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

******************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =     30.75
  DOWNSTREAM ELEVATION(FEET) =     26.50
  ELEVATION DIFFERENCE(FEET) =      4.25
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.787
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    86.25
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.455
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.54

******************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  61
------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   26.50  DOWNSTREAM ELEVATION(FEET) =   19.50
  STREET LENGTH(FEET) =   398.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  11.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.34
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.42
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.62
  STREET FLOW TRAVEL TIME(MIN.) =   2.74   Tc(MIN.) =    5.53
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.051
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.868
  SUBAREA AREA(ACRES) =    0.30      SUBAREA RUNOFF(CFS) =    1.60
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       2.10

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.14
  FLOW VELOCITY(FEET/SEC.) =  2.69   DEPTH*VELOCITY(FT*FT/SEC.) =   0.78
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    112.00 =     498.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    112.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.051
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8752
  SUBAREA AREA(ACRES) =    0.21   SUBAREA RUNOFF(CFS) =    1.13
  TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       3.23
  TC(MIN.) =    5.53

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    17.00  DOWNSTREAM(FEET) =    14.30
  FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.90
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.23
  PIPE TRAVEL TIME(MIN.) =   0.92    Tc(MIN.) =    6.45
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    113.00 =     768.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    113.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.45
  RAINFALL INTENSITY(INCH/HR) =   5.48
  TOTAL STREAM AREA(ACRES) =     0.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.23
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    115.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =     24.50
  DOWNSTREAM ELEVATION(FEET) =     23.90
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.902
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    56.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.455
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.35
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.35

****************************************************************************
  FLOW PROCESS FROM NODE    115.00 TO NODE    116.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   23.90  DOWNSTREAM ELEVATION(FEET) =   22.90
  STREET LENGTH(FEET) =   241.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  11.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.84
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.40
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.25
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.34
  STREET FLOW TRAVEL TIME(MIN.) =   3.20   Tc(MIN.) =    6.10
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.676
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.19      SUBAREA RUNOFF(CFS) =    0.97
  TOTAL AREA(ACRES) =        0.2        PEAK FLOW RATE(CFS) =       1.28

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.03
  FLOW VELOCITY(FEET/SEC.) =  1.37   DEPTH*VELOCITY(FT*FT/SEC.) =   0.42
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    116.00 =     316.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    113.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.10
  RAINFALL INTENSITY(INCH/HR) =   5.68
  TOTAL STREAM AREA(ACRES) =     0.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.28

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
```

```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.23     6.45        5.480          0.61
      2        1.28     6.10        5.676          0.25

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        4.34     6.10       5.676
      2        4.46     6.45       5.480

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.46   Tc(MIN.) =    6.45
  TOTAL AREA(ACRES) =        0.9
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    113.00 =     768.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    117.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    14.30  DOWNSTREAM(FEET) =     9.00
  FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.11
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.46
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    6.47
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    117.00 =     793.00 FEET.

+--------------------------------------------------------------------------+
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|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =     24.30
  DOWNSTREAM ELEVATION(FEET) =     21.75
  ELEVATION DIFFERENCE(FEET) =      2.55
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.206
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.50
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.455
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.48

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   21.75  DOWNSTREAM ELEVATION(FEET) =   18.74
  STREET LENGTH(FEET) =   253.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  14.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

```
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.06
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.43
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.00
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.51
  STREET FLOW TRAVEL TIME(MIN.) =   2.11   Tc(MIN.) =    5.31
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.208
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.798
  SUBAREA AREA(ACRES) =    0.24      SUBAREA RUNOFF(CFS) =    1.18
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       1.64

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   7.99
  FLOW VELOCITY(FEET/SEC.) =  2.16   DEPTH*VELOCITY(FT*FT/SEC.) =   0.62
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    122.00 =     353.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    122.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.208
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7947
  SUBAREA AREA(ACRES) =    0.25   SUBAREA RUNOFF(CFS) =    1.23
  TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       2.86
  TC(MIN.) =    5.31

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    124.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    15.00  DOWNSTREAM(FEET) =     8.00
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.80
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.86
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    5.35
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    124.00 =     388.00 FEET.

+--------------------------------------------------------------------------+
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+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    125.00 TO NODE    126.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =     24.50
  DOWNSTREAM ELEVATION(FEET) =     23.90
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.902
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    56.00
```

```
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.455
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.35
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.35

****************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    127.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   23.90  DOWNSTREAM ELEVATION(FEET) =   22.90
  STREET LENGTH(FEET) =   241.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 28.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  14.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.86
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.28
    HALFSTREET FLOOD WIDTH(FEET) =    7.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.27
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.35
  STREET FLOW TRAVEL TIME(MIN.) =   3.17   Tc(MIN.) =    6.07
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.693
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  SUBAREA AREA(ACRES) =    0.20      SUBAREA RUNOFF(CFS) =    1.02
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       1.33

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.17
  FLOW VELOCITY(FEET/SEC.) =  1.39   DEPTH*VELOCITY(FT*FT/SEC.) =   0.43
  LONGEST FLOWPATH FROM NODE    125.00 TO NODE    127.00 =     316.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    128.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    17.00  DOWNSTREAM(FEET) =     7.00
  FLOW LENGTH(FEET) =    90.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.62
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.33
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    6.23
  LONGEST FLOWPATH FROM NODE    125.00 TO NODE    128.00 =     406.00 FEET.

+--------------------------------------------------------------------------+
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|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    141.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =     24.50
  DOWNSTREAM ELEVATION(FEET) =     23.90
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.902
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    56.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.455
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.35
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.35

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    142.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   23.90  DOWNSTREAM ELEVATION(FEET) =   17.00
  STREET LENGTH(FEET) =   330.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  15.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.12
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.69
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.61
  STREET FLOW TRAVEL TIME(MIN.) =   2.17   Tc(MIN.) =    5.07
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.396
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.867
  SUBAREA AREA(ACRES) =    0.28      SUBAREA RUNOFF(CFS) =    1.54
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       1.89

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.43
  FLOW VELOCITY(FEET/SEC.) =  2.81   DEPTH*VELOCITY(FT*FT/SEC.) =   0.77
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    142.00 =     405.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    142.00 TO NODE    143.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    13.00  DOWNSTREAM(FEET) =     9.00
  FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.53
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.89
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    5.43
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    143.00 =     545.00 FEET.

+----------------------------------------------------------------------------+
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|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    150.00 TO NODE    151.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =     24.50
  DOWNSTREAM ELEVATION(FEET) =     23.90
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.902
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    56.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.455
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.35
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.35

****************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    152.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   23.90  DOWNSTREAM ELEVATION(FEET) =   17.00
  STREET LENGTH(FEET) =   330.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  15.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.11
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.69
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.51
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.60
  STREET FLOW TRAVEL TIME(MIN.) =   2.20   Tc(MIN.) =    5.10
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.375
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.884
  SUBAREA AREA(ACRES) =    0.27      SUBAREA RUNOFF(CFS) =    1.51
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       1.86

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.38
  FLOW VELOCITY(FEET/SEC.) =  2.81   DEPTH*VELOCITY(FT*FT/SEC.) =   0.77
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    152.00 =     405.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    153.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    13.00  DOWNSTREAM(FEET) =     9.75
  FLOW LENGTH(FEET) =   155.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.81
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.86
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =    5.54
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    153.00 =     560.00 FEET.
```

```
+----------------------------------------------------------------------------+
|                                                                            |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    145.00 TO NODE    146.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .6400
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   165.00
  UPSTREAM ELEVATION(FEET) =     17.00
  DOWNSTREAM ELEVATION(FEET) =     14.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.602
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    68.18
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.999
  SUBAREA RUNOFF(CFS) =      1.04
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      1.04

+----------------------------------------------------------------------------+
|                                                                            |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    155.00 TO NODE    156.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   165.00
  UPSTREAM ELEVATION(FEET) =     17.00
  DOWNSTREAM ELEVATION(FEET) =     14.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.749
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    68.18
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.455
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.78
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.78
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.2  TC(MIN.) =      4.75
  PEAK FLOW RATE(CFS)   =       0.78
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix B

Curb Inlet Sizing Calculations

INLET CALCULATIONS

CAMINO DEL MAR PROJECT

BRIDGE NO. 57C-0209

Inlets in SAG condition

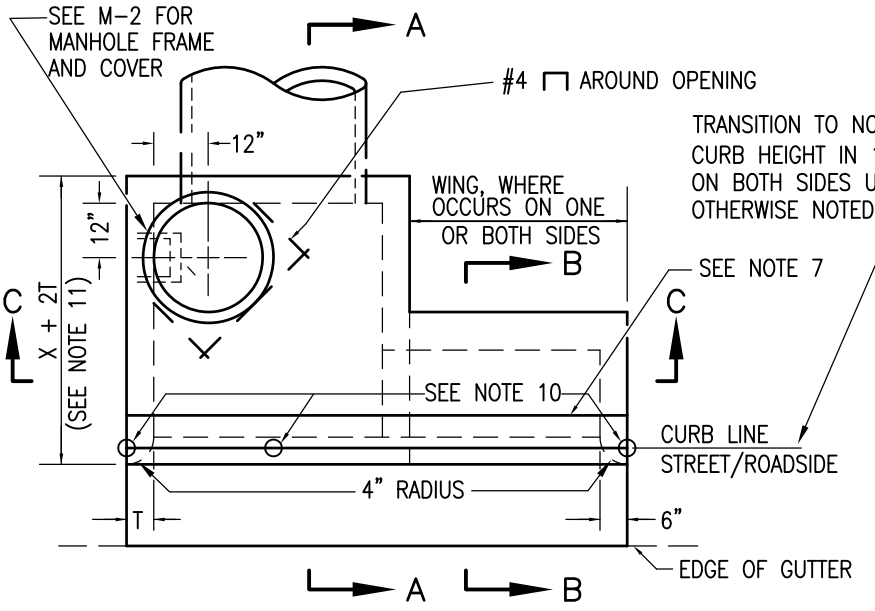
$Q = 0.67\ h\ L\ (2gd_o)^{1/2}$ (equation 2-9, San Diego Hydraulic Design Manual)

Node	Q (cfs)	h (ft)	g (ft^2/s)	d_o (ft)	Req. inlet opening (ft)	Length Used (ft)	Type
112	3.23	0.5	32.2	0.33	2.09	5	B, SDRSD D-02
122	2.86	0.5	32.2	0.33	1.85	5	B, SDRSD D-02

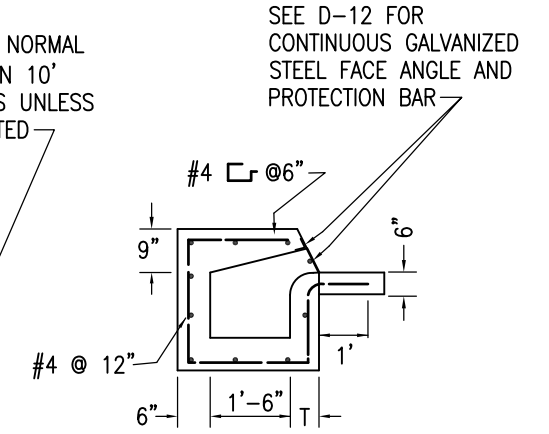
Inlets on Continuous slope

$Q/L_T = 0.7\ (a + y)^{3/2}$ (equation 2-2, San Diego Hydraulic Design Manual)

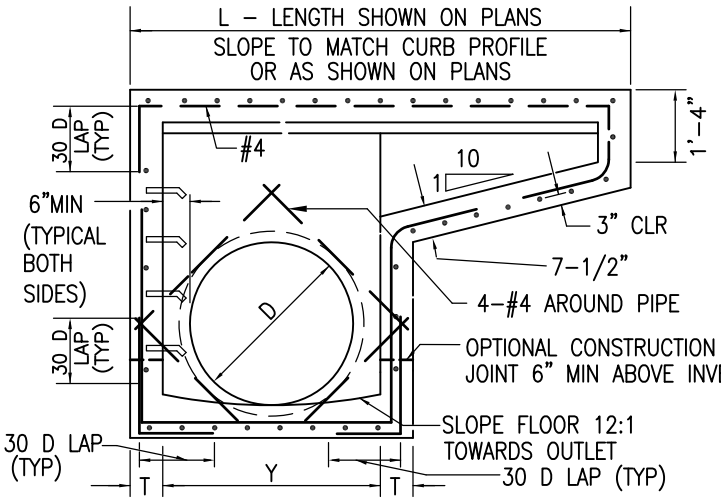
Node	Slope %	Q (cfs)	y (ft)	a (ft)	Req. inlet opening (ft)	Length Used (ft)	Type
142	2.00	1.89	0.21	0.33	6.80	8	B-1, SDRSD D-02
152	2.00	1.86	0.21	0.33	6.70	8	B-1, SDRSD D-02



PLAN

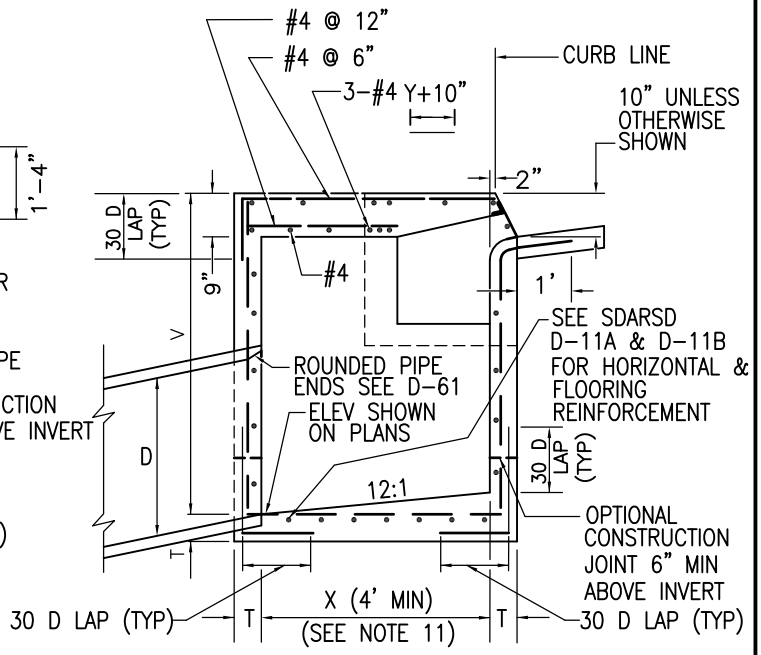


SECTION B-B



Y IS DETERMINED BY PIPE SIZE - 4' MIN, 8' MAX

SECTION C-C



SECTION A-A

NOTES

1. SEE D-11A, D-11B & D-12 FOR ADDITIONAL NOTES AND DETAILS.
2. TYPES ARE DESIGNATED ON PLANS AS FOLLOWS: B (NO WING), B-1 (ONE WING) or B-2 (TWO WINGS).
3. MAINTAIN 1-1/2" CLEAR SPACING BETWEEN REINFORCING AND CONCRETE SURFACE UNLESS OTHERWISE NOTED.
4. STEPS SHALL BE INSTALLED WHEN V EXCEEDS 4'. SEE D-11A FOR DETAILS.
5. CONCRETE GUTTER TO MATCH ADJACENT GUTTERS.
6. AN EXPANSION JOINT SHALL BE PLACED AT THE ENDS OF THE INLET WHERE THE CURB IS TO ADJOIN.
7. PROVIDE 1/4" TOOLED GROOVE IN TOP SLAB IN LINE WITH BACK OF ADJACENT CURB.
8. SURFACE OF TOP SLAB TO MATCH SIDEWALK FINISH AND SLOPE.
9. IF REQUIRED BY LOCAL AGENCY, EXTEND TOP SLAB STEEL REINFORCEMENT 12" INTO ADJACENT SIDEWALK.
10. ELEVATIONS SHALL BE SHOWN ON PLANS WHERE INDICATED BY "○" SYMBOL.
11. IF REQUIRED BY LOCAL AGENCY, ENLARGE CURB INLET TOP TO WIDTH OF ADJACENT SIDEWALK (X + 2T NOT TO EXCEED 5'-6") BY LENGTH OF INLET INCLUDING WING(S). REINFORCING STEEL SHALL BE EXTENDED ACROSS ENLARGED TOP TO CLEAR DISTANCES SHOWN.

LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11
Edited	T.R.	T. Regello	10/15
Edited	M.W.	M. Widelski	10/18

SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE B

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

10/25/2018

Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-02

Appendix C

Preliminary Rip Rap – Energy Dissipation Calculations

RIP RAP CALCULATIONS

CAMINO DEL MAR PROJECT

BRIDGE NO. 57C-0209

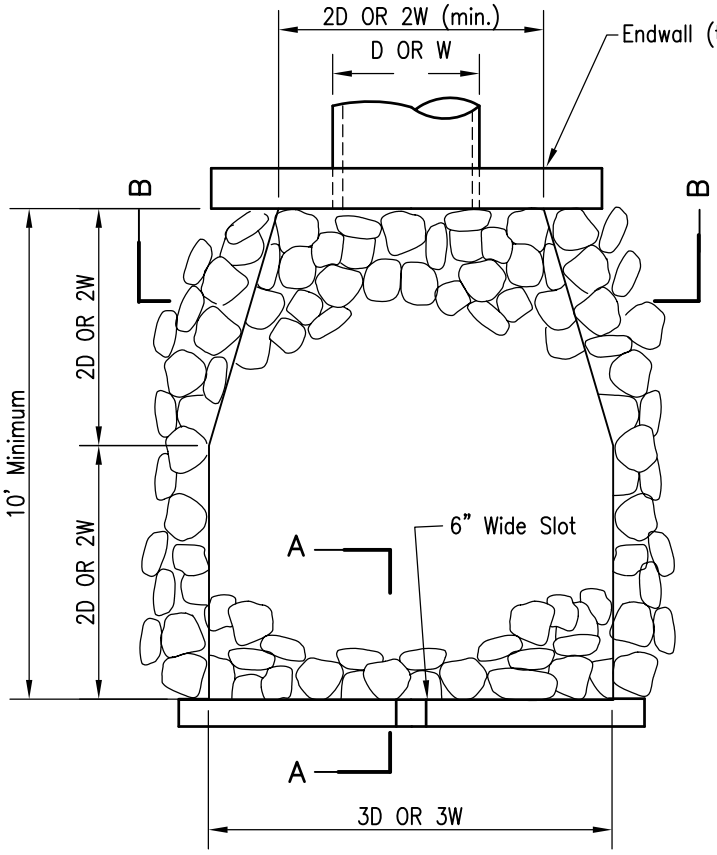
Rip Rap ID#	Location	Node #	Outlet Pipe Diameter (in)	Q (cfs)	Velocity (fps)	Width (ft)	Length (ft)	Rock Classification	Thickness (ft)
1	Northwest end of Bridge	117	18	4.46	17.11	4.5	10	2- Ton	5.4
2	275' northeast of north end of Bridge	124	18	2.86	14.8	4.5	10	1-Ton	4.4'
3	Northeast end of Bridge	128	18	1.33	9.62	4.5	10	1/4 Ton	2.7
4	Southeast end of Bridge	143	18	1.89	6.53	4.5	10	1/4 Ton	2.7
5	Southwest end of Bridge	153	18	1.86	5.81	4.5	10	1/4 Ton	2.7

Table 7–1 (below) per July 2005
San Diego County Drainage Design Manual

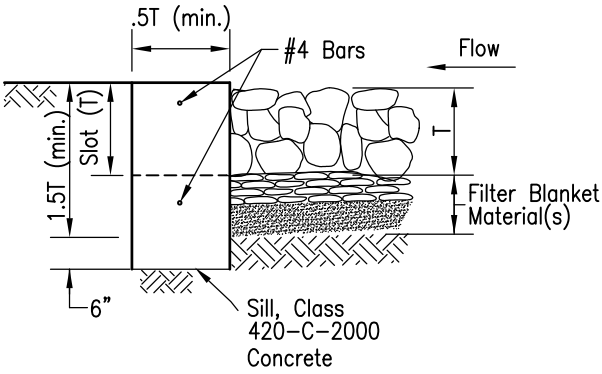
Design Velocity ft/sec*	Rock Class	Rip–Rap Thickness "T" (min)
6–10	No. 2 backing	1.1ft
10–12	1/4 ton	2.7ft
12–14	1/2 ton	3.5ft
14–16	1 ton	4.4ft
16–18	2 ton	5.4ft

*over 20 ft/sec requires special design

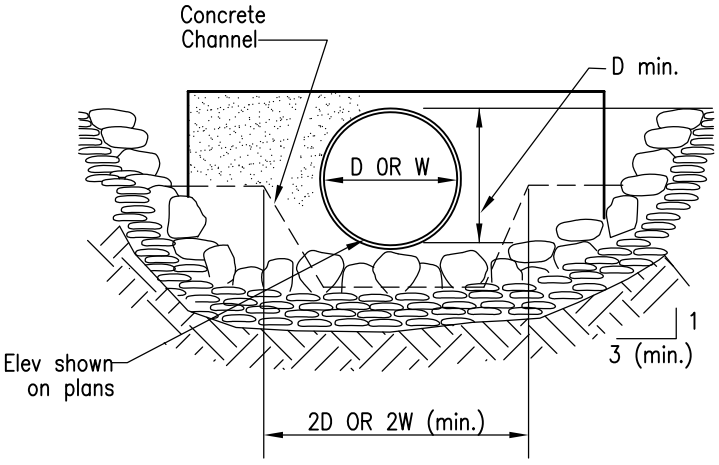
D = Pipe Diameter
W = Bottom Width of Channel



PLAN



SECTION A–A



SECTION B–B

NOTES

1. Plans shall specify:
   (A) Rock Class and rip–rap thickness (T). T shall be at least 1.5 times the nominal equivalent diameter of stone (d_{50}) of the specified rip–rap.
   (B) Filter blanket material, number of layers and thickness.
2. Rip rap shall be either quarry stone or broken concrete (if shown on the plans). Cobbles are not acceptable.
3. Rip rap shall be placed over filter blanket material, which may be either granular material or non–woven geotextile filter fabric; material at weight specified in plans or specifications.
4. See Table 200–1.7 in San Diego Regional Supplement to Greenbook for selection of filter blanket.
5. Rip rap energy dissipaters shall be designated as either Type 1 or Type 2. Type 1 shall be with concrete sill; Type 2 shall be without sill.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Add Rip Rap Table		S. Brady	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

RIP RAP
ENERGY DISSIPATER

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-40**

Appendix I

Noise Study Report

Camino Del Mar Bridge Replacement Project

Noise Study Report

Prepared For:

California Department of Transportation
District 11
4050 Taylor Street, San Diego, CA 92110
San Diego, CA 92110

Prepared By:

HELIX Environmental Planning, Inc.
7578 El Cajon Blvd., Suite 200
La Mesa, CA 91942

April 2022 | 01391.00002.002

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SUMMARY

HELIX Environmental Planning, Inc. (HELIX) conducted a noise analysis to determine if changes in the roadway elevation associated with the proposed Camino Del Mar Bridge Replacement Project would adversely affect adjacent noise sensitive land uses. The analysis focuses on estimating noise levels from Project implementation and determining if noise attenuation features (i.e., barriers) would be necessary to attenuate noise from traffic along the improved Camino del Mar bridge.

The areas most susceptible to changes in traffic noise levels consist of single-family and multi-family residential uses on both sides of Camino del Mar along the southern portion of the Project alignment. Noise levels are calculated to exceed applicable California Department of Transportation (Caltrans) and City of Del Mar standards. Noise abatement would therefore be required to bring noise levels into compliance.

Construction of the proposed Project could affect nearby residences. However, implementation of standard best management practices would minimize construction noise.

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List of Abbreviated Terms

ADT	Average daily trips
CAD	Computer-aided design
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
City	City of Del Mar
CNEL	Community Noise Equivalent Level
dB	decibels
dBA	A-weighted decibels
FHWA	Federal Highway Administration
Hz	Hertz
I-	Interstate
kHz	kilohertz
L_{DN}	Day-Night Level
L_{EQ}	Equivalent Sound Level
$L_{EQ}(h)$	Equivalent Sound Level over one hour
L_{MAX}	Maximum Sound Level
LOS	level of service
L_{XX}	Percentile-Exceeded Sound Level
mPa	micro-Pascals
NAC	noise abatement criteria
NADR	Noise Abatement Decision Report
NEPA	National Environmental Policy Act
NSR	Noise Study Report
Protocol	Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects
RCNM	Roadway Construction Noise Model
SPL	sound pressure level
STC	Sound Transmission Class

TeNS	Technical Noise Supplement (Caltrans)
TNM 2.5	FHWA Traffic Noise Model Version 2.5
TIA	Transportation Impact Analysis

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CHAPTER 1 INTRODUCTION

The proposed Camino Del Mar Bridge Replacement Project (Project) involves the replacement of the existing Camino del Mar Bridge No. 57C-0209 (bridge), which crosses the San Dieguito Lagoon (lagoon) in the City of Del Mar (Del Mar or City). The bridge was determined in 2010 to be eligible for rehabilitation funding under the Highway Bridge Program but was later determined to be structurally deficient upon preparation of a Final Rehabilitation Strategy Report in 2012. As a result, bridge replacement was recommended.

This Noise Study Report (NSR) assesses potential noise impacts which may result from construction and implementation of the proposed Project.

1.1 PURPOSE OF THE NOISE STUDY REPORT

The purpose of the NSR is to determine if changes in the roadway elevation associated with the proposed bridge replacement would adversely affect adjacent noise sensitive land uses. The analysis focuses on estimating changes in noise levels from Project implementation and determining if noise attenuation features (i.e., barriers) would be necessary to attenuate noise from traffic along the improved Camino del Mar bridge.

The California Department of Transportation (Caltrans) is the federal lead agency under the National Environmental Policy Act (NEPA) providing local assistance to the City. The Project is subject to environmental review pursuant to both NEPA and the California Environmental Quality Act (CEQA), with the City as lead agency under CEQA.

1.2 PROJECT PURPOSE AND NEED

Camino del Mar is a north-south roadway along the coast that spans the lagoon via the bridge, provides connections to coastal destinations in the area, and serves as a local bypass of Interstate (I-) 5 for motorists travelling along the coastline. The bridge was constructed in 1932, widened in 1953, and last updated in 2001 when a pedestrian overhang was replaced and safety rails were added.

As mentioned above, the bridge was previously determined to be structurally deficient, and a bridge replacement was therefore recommended. The proposed Project involves the replacement of the bridge to continue providing vehicle, pedestrian, and bicycle movement along Camino del Mar as it crosses the lagoon. The replacement bridge has been designed to accommodate a mid-range sea level rise scenario of 38 inches by the year 2100 during a 100-year flood event while maintaining safe roadway design and avoiding roadway conflicts with driveways and coastal access points.

CHAPTER 2 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The bridge is located approximately one mile west of I-5, within Del Mar in western San Diego County (see Figure 1, *Regional Location*). The Project site includes the existing bridge along Camino del Mar over the lagoon and areas immediately surrounding the bridge in the northwestern part of the City (see Figure 2, *Project Location*). Regional access to the Project is provided from I-5, which runs parallel to the

bridge about one mile to the east. The bridge serves as an important north-south connection for coastal residents and visitors in the vicinity and the greater San Diego region and is frequently used by motorists, bicyclists, hikers, and pedestrians. The bridge is situated between the State Fairgrounds and the Pacific Ocean near coastal destinations and provides access to local beaches, open space areas, hiking trails, the Del Mar Village (the City's central business district), and Torrey Pines State Beach (see Figure 3a, *General Project Setting,* and Figure 3b, *Focused Project Setting*). The Camino del Mar roadway becomes Highway 101 north of Via de la Valle within the City of Solana Beach, about one-quarter mile north of the bridge.

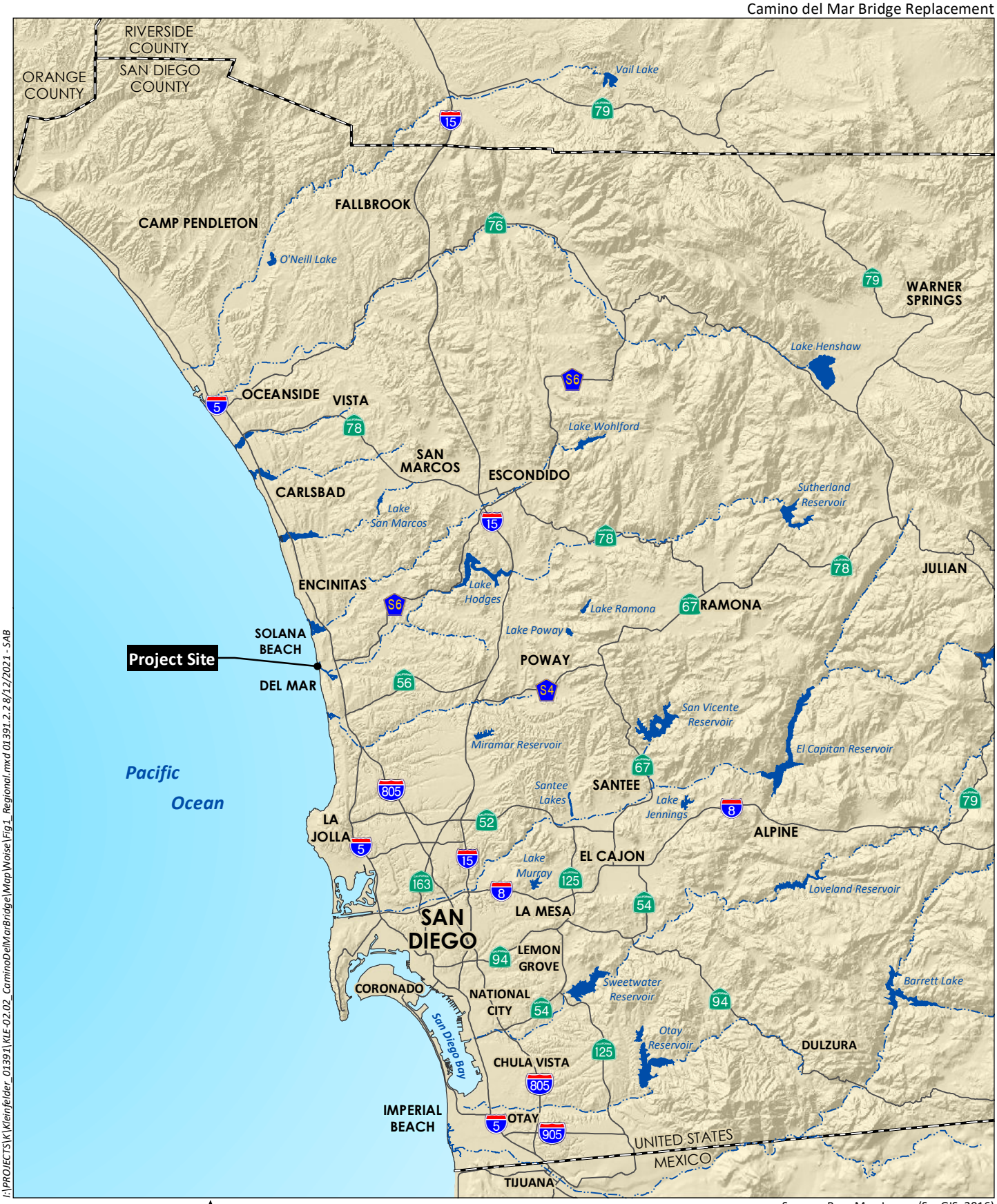
2.2 PROJECT DESCRIPTION

The proposed Project involves the replacement of the Camino del Mar bridge to continue providing vehicle, pedestrian, and bicycle movement along Camino del Mar as it crosses the lagoon. Coastal access to Del Mar Beach, including Dog Beach, would be maintained. The proposed bridge design consists of a five-span cast-in-place prestressed concrete box girder bridge with variable depth bridge with a length of 624 feet between abutments, a width of 68.5 feet, and an area of about 41,800 square feet (0.96 acre).

In comparison to the existing bridge, the replacement bridge would be located along the same horizontal alignment, would be slightly longer, wider, and higher, and would result in a reduction in the number of piers in the lagoon. The additional approximately 28 feet, 2 inches in bridge length and additional 7 feet, 8 inches in bridge height near the center of the bridge would accommodate a mid-range sea level rise scenario of 38 inches by the year 2100 during a 100-year flood event while maintaining safe roadway design and avoiding roadway conflicts with driveways and coastal access points. The additional bridge width of approximately 7 feet, 5 inches would accommodate two-way pedestrian and bicycle movement across the bridge. The roadway approach zones within Camino del Mar would also require modifications to accommodate the raised elevation of the bridge, including reconstructing the sidewalks to meet the proposed pedestrian sidewalks on both sides of the replacement bridge. There would be no change in vehicle capacity as the existing two-lane Camino del Mar roadway would continue to provide two vehicle traffic lanes.

The Project is estimated to be constructed over 27 months during 5 distinct construction stages: site preparation, demolition and replacement of east side, demolition and replacement of west side, bridge median improvements, and final improvements. With the exception of approximately 12 temporary short-term night closures (one to four nights per stage), the contractor would maintain continuous vehicular, pedestrian, and bicycle access along the Camino del Mar bridge throughout construction by shifting travel lanes from one side to another as the bridge is replaced. Bridge demolition and replacement would occur at one half of the bridge at a time, beginning with the east side (lagoon side) followed by the west side (ocean side). During the demolition and replacement of each side of the bridge, the opposite side would be used to re-route both lanes of traffic.

Due to limited on-site construction staging areas, the contractor is anticipated to need additional off-site staging areas for materials, equipment, and office. Several potential staging areas have been identified, including the Del Mar State Fairgrounds, located at 2260 Jimmy Durante Boulevard to the east of the Project site, and the City's Public Works Yard, located at 2240 Jimmy Durante Blvd to the southeast of the Project site. Ultimate staging areas would be selected by the construction contractor but are included within the area of impact evaluated herein for environmental clearance.



I:\PROJECTS\K\Kleinfelder_01391\KLE-02.02_CaminoDelMarBridge\Map\Noise\Fig1_Regional.mxd 01391.2.2 8/12/2021 - SAB

0 8 Miles

Source: Base Map Layers (SanGIS, 2016)

HELIX Environmental Planning

Regional Location

Figure 1



I:\PROJECTS\K\Kleinfelder_01391\KLE-02.02_CaminoDelMarBridge\Map\Noise\Fig2_Location.mxd 01391.2.2 8/12/2021 -RK

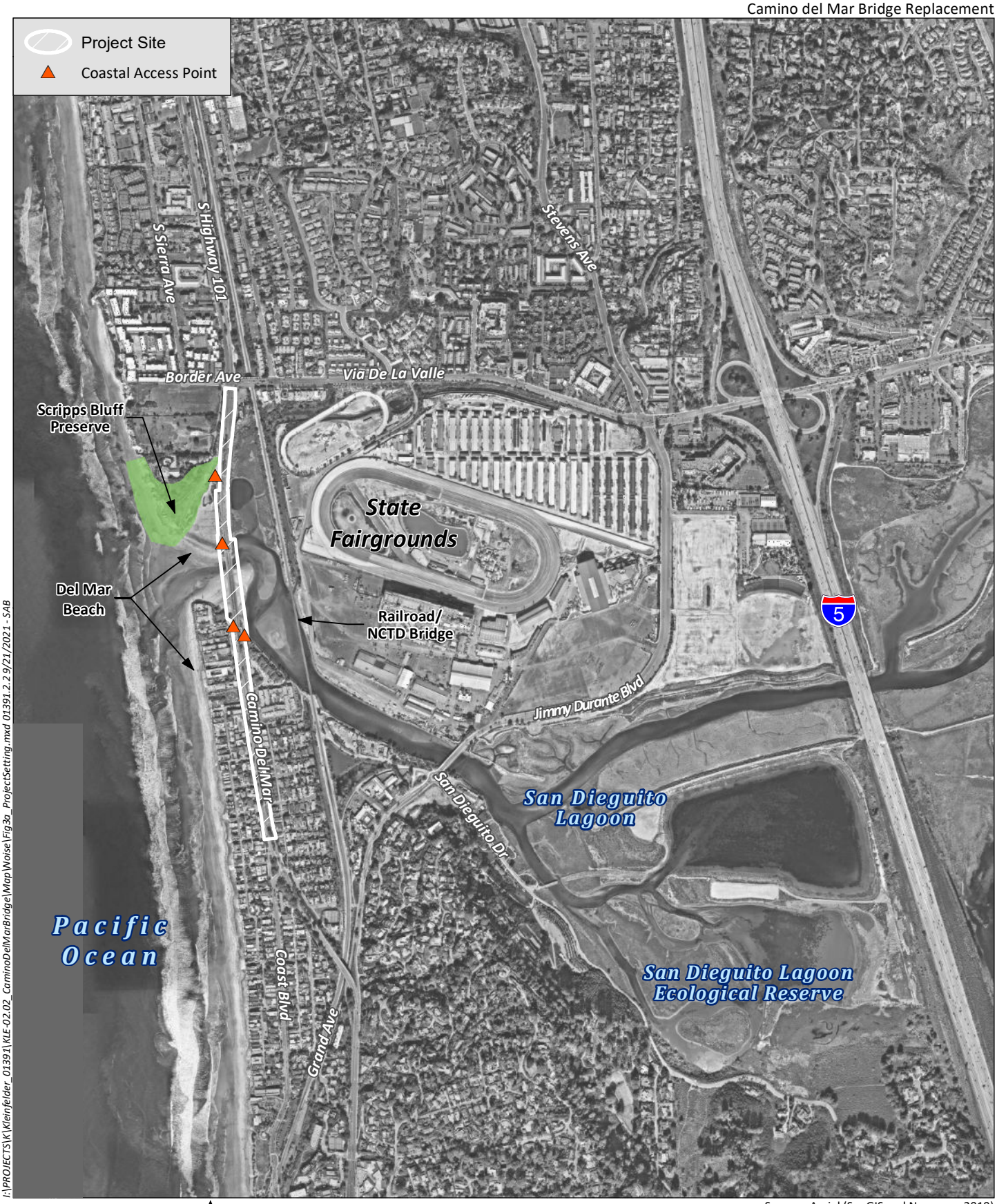
0 600 Feet

Source: Aerial (SanGIS and Nearmap, 2019)

HELIX Environmental Planning

Project Location

Figure 2



I:\PROJECTS\K\Kleinfelder_01391\KLE-02.02_CaminoDelMarBridge\Map\Noise\Fig3a_ProjectSetting.mxd 01391.2.2 9/21/2021 - SAB

0 1,200 Feet

Source: Aerial (SanGIS and Nearmap, 2019)

HELIX Environmental Planning

General Project Setting

Figure 3a



I:\PROJECTS\K\Kleinfelder_01391\KLE-02.02_CaminoDelMarBridge\Map\Noise\Fig3b_ProjectSetting.mxd 01391.2.2 9/21/2021 - SAB

0 600 Feet

Source: Aerial (SanGIS and Nearmap, 2019)

HELIX Environmental Planning

Focused Project Setting

Figure 3b

CHAPTER 3 FUNDAMENTALS OF TRAFFIC NOISE

The following is a brief discussion of fundamental traffic noise concepts. For a detailed discussion, please refer to Caltrans' Technical Noise Supplement (TeNS) (Caltrans 2013), a technical supplement to the Protocol that is available on Caltrans Web site (http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf).

3.1 SOUND, NOISE, AND ACOUSTICS

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receptor determine the sound level and characteristics of the noise perceived by the receptor. The field of acoustics deals primarily with the propagation and control of sound.

3.2 FREQUENCY

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

3.3 SOUND PRESSURE LEVELS AND DECIBELS

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this huge range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for young people is about 0 dB, which corresponds to 20 mPa.

3.4 A-WEIGHTED DECIBELS

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000 to 8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower

frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an "A-weighted" sound level (expressed in units of dBA) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with highway-traffic noise. Noise levels for traffic noise reports are typically reported in terms of A-weighted decibels or dBA. Table 3-1 describes typical A-weighted noise levels for various noise sources.

Table 3-1
TYPICAL A-WEIGHTED NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 miles per hour		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, at 100 feet	**— 70 —**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**— 60 —**	
		Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	**— 0 —**	Lowest threshold of human hearing

Source: Caltrans (2013)

3.5 HUMAN RESPONSE TO CHANGES IN NOISE LEVELS

As discussed above, doubling sound energy results in a 3-dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the midfrequency (1,000 Hz to 8,000 Hz) range. In typical noisy environments, changes in noise of

1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dB increase in sound, would generally be perceived as barely detectable.

3.6 NOISE DESCRIPTORS

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in traffic noise analysis.

- **Equivalent Sound Level (L_{EQ}):** L_{EQ} represents an average of the sound energy occurring over a specified period. In effect, L_{EQ} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level (L_{EQ}[h]) is the energy average of A-weighted sound levels occurring during a one-hour period and is the basis for noise abatement criteria (NAC) used by Caltrans and FHWA.

- **Percentile-Exceeded Sound Level (L_{XX}):** L_{XX} represents the sound level exceeded for a given percentage of a specified period (e.g., L_{10} is the sound level exceeded 10 percent of the time, and L_{90} is the sound level exceeded 90 percent of the time).

- **Maximum Sound Level (L_{MAX}):** L_{MAX} is the highest instantaneous sound level measured during a specified period.

- **Day-Night Level (L_{DN}):** L_{DN} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.

- **Community Noise Equivalent Level (CNEL):** Similar to L_{DN}, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m., and a 5-dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

3.7 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors.

3.7.1 Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 decibels for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be

treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 decibels for each doubling of distance from a line source.

3.7.2 Ground Absorption

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance.

3.7.3 Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

3.7.4 Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receptor specifically to reduce noise. A barrier that breaks the line of sight between a source and a receptor will typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction. Vegetation between the highway and receptor is rarely effective in reducing noise because it does not create a solid barrier.

CHAPTER 4 REGULATIONS AND POLICIES

4.1 CALIFORNIA DEPARTMENT OF TRANSPORTATION

4.1.1 Caltrans Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects

This Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects (Protocol) specifies the policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction of federal or federal-aid highway projects. Table 4-1

summarizes noise abatement criteria (NAC) used in the Protocol corresponding to various land use activity categories. Activity categories and related traffic noise impacts are determined based on the actual land use in a given area.

Table 4-1
ACTIVITY CATEGORIES AND NOISE ABATEMENT CRITERIA

Activity Category	NAC, Hourly A-Weighted Noise Level (dBA-L_{EQ}[h])[1]	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B[2]	67 Exterior	Residential.
C[2]	67 Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	N/A[3]	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	N/A	Undeveloped lands that are not permitted.

[1] The L_{EQ}(h) activity criteria values are for impact determination only and are not design standards for noise abatement measures. All values are A-weighted decibels (dBA).
[2] Includes undeveloped lands permitted for this activity category.
[3] No standard specified.

In identifying noise impacts, primary consideration is given to exterior areas of frequent human use. In situations where there are no exterior activities, or where the exterior activities are far from the roadway or physically shielded in a manner that prevents an impact on exterior activities, the interior criterion (Activity Category D) is used as the basis for determining a noise impact.

The Protocol defines a noise increase as substantial when the predicted noise levels with project implementation exceed existing noise levels by 12 dBA. The Protocol also states that a sound level is considered to approach a NAC level when the sound level is within 1 dB of the NAC identified in 23 Code of Federal Regulations (CFR) 772 (e.g., 66 dBA is considered to approach the NAC of 67 dBA, but 65 dBA is not).

The TeNS to the Protocol provides detailed technical guidance for the evaluation of highway traffic noise. This includes field measurement methods, noise modeling methods, and report preparation guidance.

4.2 CITY OF DEL MAR

4.2.1 City of Del Mar Community Plan Noise Element

The City's goals for transportation noise sources are published in the Community Plan (i.e., General Plan) Transportation Element, Noise Section (March 1976, incl. 1986 amendments). This section of the Community Plan identifies 65 CNEL as the maximum noise level compatible with residential land uses.

4.2.2 City of Del Mar Noise Ordinance

The City's Municipal Code regulates noise produced by construction activities. The City regulates noise produced on any property that may affect occupants of nearby properties. Section 9.20.050 of the City's Municipal Code identifies construction noise level limits and states that:

Any person who operates powered construction or landscape equipment and/or who erects, constructs, demolishes, excavates for, alters or repairs any building or structure within the City of Del Mar in such a manner as to cause noise to be received beyond the boundaries of the property on which the construction work is occurring shall comply with the following:

A. No construction work shall be performed on Sundays or City holidays.

B. No construction work shall be performed before 9:00 a.m. or after 7:00 p.m. on Saturday.

C. No construction work shall be performed before 7:00 a.m. or after 7:00 p.m. on Monday through Friday.

D. Construction activity shall not cause an hourly average sound level greater than 75 decibels on property zoned or used for residential purposes. Exception: A person may perform construction work on the person's own property, provided such construction activity is not carried on for profit or livelihood, between the hours of 10:00 a.m. and 5:00 p.m. on Sundays and City holidays.

CHAPTER 5 STUDY METHODS AND PROCEDURES

The noise analysis for the Project was conducted in a manner consistent with the Protocol (Caltrans 2020) and associated TeNS (Caltrans 2013). The purpose of the Protocol is to present Caltrans policies and procedures for applying the federal Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772) in California. The Protocol is supplemented by the TeNS, and contains Caltrans noise analysis procedures, practices, and other useful technical background information related to the analysis of highway noise impacts and abatement.

5.1 METHODS FOR IDENTIFYING LAND USES AND SELECTING NOISE MEASUREMENT AND MODELING RECEIVER LOCATIONS

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts from the proposed Project, and that involve frequent human use. As stated in the Protocol, noise abatement is only considered where frequent human use occurs and where a lowered noise level would be of benefit. Noise-sensitive land uses with frequent human use that would be affected by the Project consist of single-family and multi-family residential uses on both sides of Camino del Mar along the southern portion of the Project alignment. Three measurement locations, one on the west side of the roadway and two on the east side of the roadway, were chosen to determine noise levels representative of the general area of these residences (see Figure 4, *Noise Measurement Locations*). Two measurements (ST-1 and ST-2) were short-term measurements, and one measurement (LT-1) was a long-term measurement.

5.2 FIELD MEASUREMENT PROCEDURES

A field noise study was conducted in accordance with recommended procedures in TeNS. The following is a summary of the procedures used to collect short-term and long-term noise level data.

5.2.1 Short-term Measurements

Short-term monitoring was conducted at two locations (ST-1 and ST-2; see Figure 4 and Appendix A) on August 24, 2021, using a Larson Davis Model 831 Class 1 Sound Level Meter. The meter was calibrated prior to the measurements using a Larson Davis Model CAL250 calibrator. The measurements were taken over a 15-minute period at each location.

Field staff attended the meters during the short-term measurements to document conditions in the measurement location area. The recorded temperature during the measurements was 75 degrees Fahrenheit, wind speeds ranged between 0 and 1 mile per hour, and relatively humidity was 50 percent. Traffic along Camino del Mar was also classified and counted during the measurements. Vehicles were classified as automobiles, medium-duty trucks, or heavy-duty trucks. An automobile is defined as a vehicle with two axles and four tires that is designed primarily to carry passengers. Small vans and light trucks are included in this category. Medium-duty trucks include cargo vehicles with two axles and six tires. Heavy-duty trucks include vehicles with three or more axles. The posted speed along this portion of Camino del Mar is 30 mph.

5.2.2 Long-term Measurements

Long-term monitoring was conducted at one location (LT-1; see Figure 4) using a Larson Davis Spark 703 Noise Dosimeter. The purpose of this measurement was to identify variations in sound levels throughout the day. The long-term noise level data was collected over one 25-hour period beginning at 3:00 p.m. on August 24, 2021, and ending at 4:00 p.m. on August 25, 2021.

5.3 TRAFFIC NOISE LEVELS PREDICTION METHODS

Traffic noise levels were predicted using the Computer-Aided Noise Abatement (CadnaA) implementation of the FHWA Traffic Noise Model Version 2.5 (TNM 2.5). Key inputs to the traffic noise model were the locations of roadways, shielding features (e.g., topography and buildings), existing noise

barriers, ground type, and receivers. Three-dimensional representations of these inputs were developed using computer-aided design (CAD) drawings, aerial photographs, and topographic contours.

The loudest hour traffic noise typically occurs when traffic is free-flowing at full speed; this condition typically occurs at Level of Service (LOS) C. Under LOS C conditions, traffic is heavy, but remains free-flowing. The SANTEC/ITE *Guidelines for Traffic Impact Study in the San Diego Region* (2000) provides traffic levels based on roadway capacities at different LOS for collector roadways. The segment of Camino del Mar included in the Project is classified as a 2-lane collector with a traffic capacity at LOS C of 10,000 average daily trips (ADT) (STC Traffic, Inc. 2018). The LOS C ADT, existing ADT, and year 2040 ADT for this segment of Camino del Mar are presented in Table 5-1.

Table 5-1
EXISTING AND FUTURE ROADWAY VOLUMES (ADT)

Roadway Segment	Existing	2040	LOS C
Camino del Mar			
Via de la Valle to Coast Boulevard	12,540	13,800	10,000

Source: STC Traffic, Inc. 2018

For the noise analysis, it was assumed that the loudest hour traffic represents 10 percent of the LOS C daily traffic capacity, in accordance with Caltrans standards (Caltrans 2013). Traffic speed at LOS C is assumed to be 45 miles per hour, which is the design speed for the bridge portion of Camino del Mar.

The model-calculated one-hour L_{EQ} noise output, with the use of 8 to 10 percent of the average daily traffic occurring during a peak hour, is the equivalent of the CNEL (Caltrans 2013).

Vehicle classification percentages used for modeling were based on standard assumptions and observations at the Project site. It was assumed that 96 percent of traffic are automobiles (light duty vehicles), 3 percent are medium-duty trucks, and 1 percent are heavy-duty trucks.

CHAPTER 6 EXISTING NOISE ENVIRONMENT

6.1 EXISTING LAND USES

Noise-sensitive land uses that would have the potential to be affected by changed traffic noise levels from the proposed bridge elevation consist of single-family and multi-family residential uses on both sides of Camino del Mar along the southern portion of the proposed bridge alignment (see Figure 3b). Multi-family residential uses are located on the eastern side of the roadway; the closest residential structure is approximately 30 feet from the edge of the roadway. Two outdoor use areas associated with these multi-family residences, a patio and a pool area, are also located approximately 30 feet from the edge of the roadway. The multi-family residential building and outdoor use areas are at a slightly higher elevation than the roadway (approximately five feet). A vertical slat fence is located between the residential properties and the roadway; however, this type of fence does not provide noise attenuation.

Single-family residential uses are located on the western side of the roadway along the southern portion of the proposed bridge alignment. While the residential property boundaries are located approximately 50 feet from the edge of the roadway, most of the residences themselves are set back from the roadway at a distance of approximately 175 feet, with the exception of two residences slightly to the north that



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Source: Aerial (NearMap, 2019)

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Noise Measurement Locations

Figure 4

are located approximately 60 feet from the edge of the roadway. These residences on the western side of the roadway are generally at the same elevation as the roadway. A 6-foot-tall concrete wall is located between the residential properties and the roadway, which currently provides attenuation from traffic noise based on the existing roadway elevation.

Heading north along Camino del Mar, the residential properties end at the start of the existing bridge. Beach and lagoon are present on either side of the existing bridge, which has a midpoint height of approximately 17 feet. North of the existing bridge and along the northern portion of the proposed bridge alignment, beach area is located to the west at a slightly lower elevation than the roadway.

Specific topography for the roadways and the surrounding residential development was incorporated into the noise model.

6.2 NOISE MONITORING RESULTS

The existing noise environment in the Project area is characterized below based on short-term and long-term noise monitoring that was conducted.

6.2.1 Short-term Monitoring

Table 6-1 summarizes the results of the short-term noise monitoring conducted in the Project area.

Table 6-1
SUMMARY OF SHORT-TERM MEASUREMENTS

Measurement	Location[1]	Land Use	Time	dBA L_{EQ}	Autos	Medium Trucks	Heavy Trucks
ST-1	West side road	Residential	11:46 a.m. – 12:01 p.m.	63.2	205	3	0
ST-2	East side of road	Residential	12:08 p.m. – 12:23 p.m.	63.7	220	8	0

[1] Refer to Figure 4 for specific noise measurement locations.

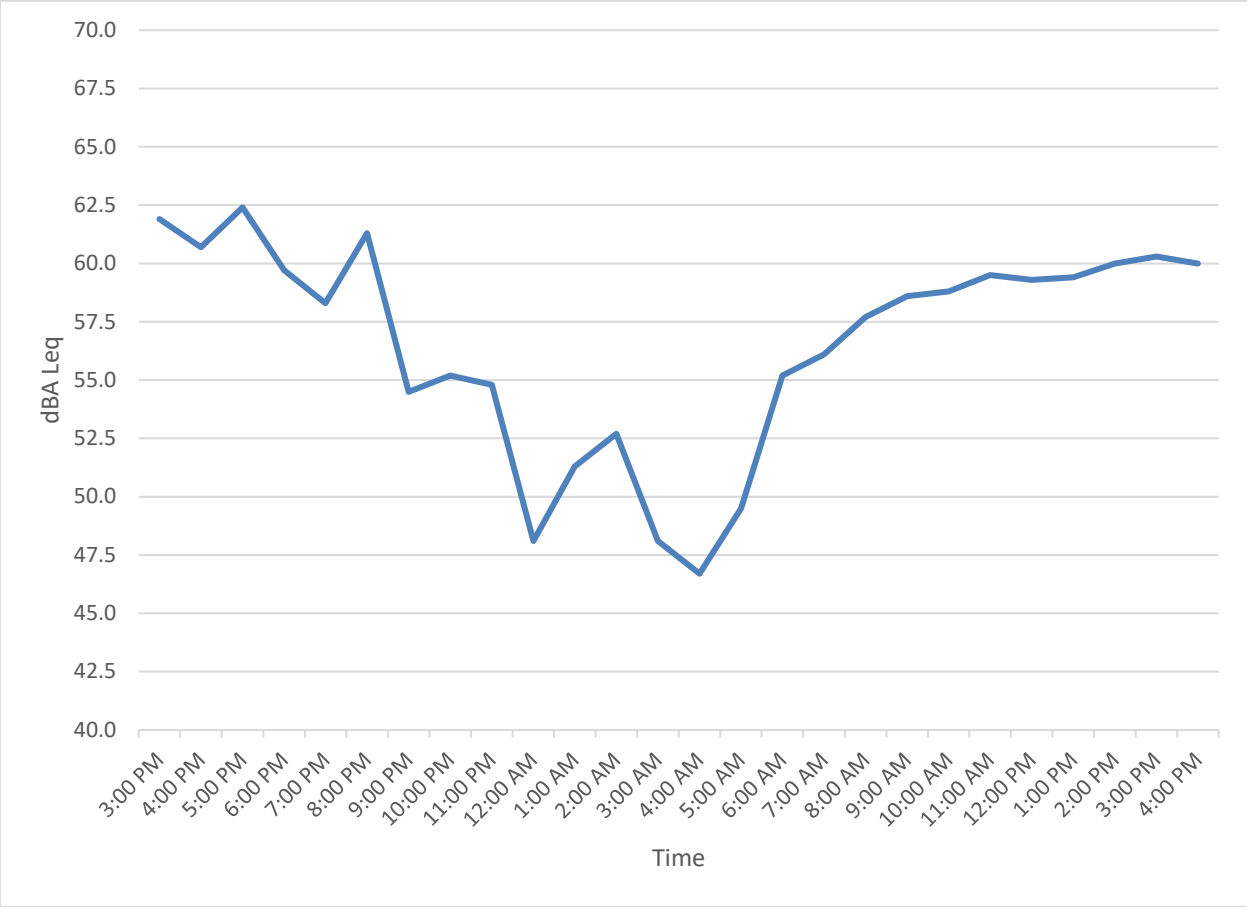
6.2.2 Long-term Monitoring

Table 6-2 and Figure 5, *Long-term Noise Monitoring Results,* provide the collected long-term measurement data from measurement LT-1. The average loudest-hour noise level measured was 62.4 dBA L_{EQ} (1-hour) at 5:00 p.m. on August 24, 2021.

Table 6-2 SUMMARY OF LONG-TERM MEASUREMENT		
Time	**dBA L_{EQ}**	**Difference from Loudest Hour (dB)**
3:00 p.m.	61.9	-0.5
4:00 p.m.	60.7	-1.7
5:00 p.m.	62.4	0.0
6:00 p.m.	59.7	-2.7
7:00 p.m.	58.3	-4.1
8:00 p.m.	61.3	-1.1
9:00 p.m.	54.5	-7.9
10:00 p.m.	55.2	-7.2
11:00 p.m.	54.8	-7.6
12:00 a.m.	48.1	-14.3
1:00 a.m.	51.3	-11.1
2:00 a.m.	52.7	-9.7
3:00 a.m.	48.1	-14.3
4:00 a.m.	46.7	-15.7
5:00 a.m.	49.5	-12.9
6:00 a.m.	55.2	-7.2
7:00 a.m.	56.1	-6.3
8:00 a.m.	57.7	-4.7
9:00 a.m.	58.6	-3.8
10:00 a.m.	58.8	-3.6
11:00 a.m.	59.5	-2.9
12:00 p.m.	59.3	-3.1
1:00 p.m.	59.4	-3.0
2:00 p.m.	60.0	-2.4
3:00 p.m.	60.3	-2.1
4:00 p.m.	60.0	-2.4

[1] Caltrans NAC for exterior noise levels in residential areas.

Figure 5. Long-term Noise Monitoring Results



6.2.3 Comparison of Measured Noise to TNM Model

TNM 2.5 was used to compare measured traffic noise levels to modeled noise levels at short-term field measurement locations. Table 6-3 compares the measured and modeled noise levels at the two short-term measurement locations (see Figure 5). The modeled noise levels are within 2 dB of the measured noise levels and are therefore considered to be in reasonable agreement with the measured noise levels. As such, no adjustments to the model were necessary.

Table 6-3
COMPARISON OF MEASURED AND MODELED NOISE LEVELS

Measurement	Measured Noise Level (dBA L_{EQ})	Modeled Noise Level (dBA L_{EQ})	Difference
ST-1	63.2	61.5	-1.7
ST-2	63.7	62.5	-1.2

CHAPTER 7 FUTURE NOISE ENVIRONMENT, IMPACTS, AND CONSIDERED ABATEMENT

7.1 PREDICTED NOISE ENVIRONMENT AND IMPACTS

This section discusses the predicted traffic noise levels for conditions with and without the Project under Caltrans and City criteria. As mentioned previously, the Project would not result in increased traffic levels. Rather, this analysis considers the traffic noise levels at nearby receptors from the raised elevation of the bridge. The proposed bridge would begin its ascent from the south in a location adjacent to the northernmost multi-family residential structure located on the eastern side of Camino del Mar and end in a location to the north that is adjacent to Del Mar Beach and the North Bluff/Scripps Bluff Preserve. Six receptors were evaluated, including four at single-family residential properties to the west of Camino del Mar (R-1 to R-4) and two at exterior use areas associated with multi-family residences to the east of Camino del Mar (R-5 and R-6). The receptor locations are shown on Figure 6, *Modeled Receptor Locations*. Noise levels are based on estimated traffic levels provided by the Transportation Impact Analysis Report (TIA; STC Traffic, Inc. 2018).

To assess Project impacts using Caltrans criteria, traffic noise levels with and without the Project were calculated using traffic volumes that would be expected under LOS C conditions (which are considered to be the highest volume of traffic that a roadway can support under free-flowing conditions). To assess Project impacts using City criteria, project-induced increases in noise levels over existing and future (year 2040) without Project conditions were calculated using traffic volumes provided in the Project TIA.

The noise is modeled as 10 percent of the traffic volume, which provides for both a conservative hourly average noise level (for use under the Caltrans criteria) and a direct equivalent to CNEL (for use under the City's criteria).

7.1.1 Caltrans

Estimated peak hour traffic noise levels under LOS C conditions without and with the Project are provided in Table 7-1 for comparison with Caltrans criteria. As shown in Table 7-1, at LOS C with the Project, the noise levels in adjacent residential areas would range from 58 to 66 dBA L_{EQ} and would approach the Caltrans NAC for residential areas of 67 dBA L_{EQ} at receivers R-5 and R-6. Noise abatement would be required for the Project to be in compliance with the NAC.

Table 7-1
LOS C PEAK HOUR NOISE LEVELS

Receiver Number	Without Project Noise Level (dBA L_{EQ})	With Project Noise Level (dBA L_{EQ})	Increase due to Project	Approach 67 dBA L_{EQ} NAC?[1]
R-1	60	61	1	No
R-2	61	61	0	No
R-3	64	64	0	No
R-4	58	58	0	No
R-5	66	66	0	Yes
R-6	66	66	0	Yes

[1] Caltrans NAC for exterior noise levels in residential areas.



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Source: Aerial (NearMap, 2019)

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Modeled Receptor Locations

Figure 6

7.1.2 City of Del Mar

Estimated traffic noise levels both without and with the Project using existing traffic volumes are provided in Table 7-2. As shown in Table 7-2, under existing traffic volumes with the Project, noise levels in adjacent residential areas would range from 59 to 67 CNEL and would exceed the City's exterior noise standard of 65 CNEL at receivers R-5 and R-6. Noise abatement would be required for the Project to be in compliance with the City's standards.

Table 7-2
EXISTING AND EXISTING PLUS PROJECT NOISE LEVELS

Receiver Number	Existing No Project (CNEL)	Existing Plus Project (CNEL)	Increase due to Project	Exceed 65 CNEL Limit?[1]
R-1	61	62	1	No
R-2	62	63	1	No
R-3	65	65	0	No
R-4	59	59	0	No
R-5	67	67	0	Yes
R-6	67	67	0	Yes

[1] City threshold for exterior noise levels in residential areas.

Estimated traffic noise levels both without and with the Project using future (year 2040) traffic volumes are provided in Table 7-3. As shown in Table 7-3, under future traffic volumes with the Project, noise levels in adjacent residential areas would range from 59 to 67 CNEL and would exceed the City's exterior noise standard of 65 CNEL at receivers R-5 and R-6. Noise abatement would be required for the Project to be in compliance with the City's standards.

Table 7-3
FUTURE AND FUTURE PLUS PROJECT NOISE LEVELS

Receiver Number	Future No Project (CNEL)	Future Plus Project (CNEL)	Increase due to Project	Exceed 65 CNEL Limit?[1]
R-1	61	62	1	No
R-2	63	63	0	No
R-3	66	65	-1	No
R-4	60	59	-1	No
R-5	67	67	0	Yes
R-6	67	67	0	Yes

[1] City threshold for exterior noise levels in residential areas.

7.2 PRELIMINARY NOISE ABATEMENT ANALYSIS

7.2.1 Caltrans

In accordance with 23 CFR 772, noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a reduced noise level. Potential noise abatement measures identified in the Protocol include the following:

- Avoiding the impact by using design alternatives, such as altering the horizontal and vertical alignment of the project;

- Constructing noise barriers;
- Acquiring property to serve as a buffer zone;
- Using traffic management measures to regulate types of vehicles and speeds; and
- Acoustically insulating public-use or nonprofit institutional structures.

All of these abatement options have been considered. Because the Project is primarily limited to raising the bridge height, abatement in the form of noise barriers is the only abatement that is considered feasible.

Noise barriers have been evaluated for feasibility based on achievable noise reduction. A reasonable cost allowance for each barrier determined to be acoustically feasible was calculated. Worksheets provided in Appendix A summarize the reasonable cost allowance calculations at the critical design receiver based on the allowance calculation procedure identified in the Protocol. Appendix B summarizes results at receiver locations for two noise barriers (Barriers NB-1 and NB-2) that have been evaluated in detail for this Project.

For a noise barrier to be considered reasonable from a cost perspective, the estimated cost of the noise barrier should be equal to or less than the total cost allowance calculated for the barrier. The cost calculations of the noise barrier should include all items appropriate and necessary for construction of the barrier, such as traffic control, drainage modification, and retaining walls. Construction cost estimates are not provided in this NSR but will be presented in the Noise Abatement Decision Report (NADR). The NADR is a design responsibility and is prepared to compile information from the NSR, other relevant environmental studies, and design considerations into a single, comprehensive document. The NADR is prepared by the project engineer after completion of the NSR. The NADR includes noise abatement construction cost estimates that have been prepared and signed by the project engineer based on site-specific conditions. Construction cost estimates are compared to reasonableness allowances in the NADR to identify which wall configurations are reasonable from a cost perspective.

The design of noise barriers presented in this report is preliminary and is not for final design of the Project. Preliminary information on the physical location, length, and height of noise barriers is provided in this report. If pertinent parameters change substantially during the final Project design, preliminary noise barrier designs may be modified or eliminated from the final Project. A final decision on the construction of the noise abatement will be made upon completion of the Project design.

The following is a discussion of noise abatement considered for the subject residence outdoor use areas, the only evaluation areas where traffic noise impacts are predicted. The traffic noise modeling results in Table 7-1 indicate that traffic noise levels at the outdoor use areas (receptors R-5 and R-6) are predicted to be 66 dBA L_{EQ}(h) under LOS C traffic conditions. Because the predicted noise level under LOS C approaches Caltrans' 67-dBA L_{EQ}(h) exterior NAC for residential uses, traffic noise impacts are predicted at these areas, and noise abatement must be considered.

7.2.1.1 Preliminary Analysis of Noise Control Barrer NB-1

Detailed modeling analysis was conducted for a barrier (NB-1) with a length of approximately 87 feet along the western and northern periphery of the affected outdoor use areas between the use areas and the roadway, which would provide attenuation for receptors R-5 and R-6. Barrier heights of five feet and

six feet were evaluated. A five-foot tall nose barrier is modeled to provide a 5-dB reduction; however, 23 CFR 722 requires that an acoustical design goal be applied to noise abatement. Caltrans' acoustical design goal is that a barrier must be predicted to provide at least 7 dB of noise reduction. Because the five-foot-tall barrier would not provide a 7-dB reduction, a six-foot-tall barrier was analyzed.

A reasonable allowance calculation sheet for this six-foot-tall barrier is provided in Appendix B. Table 7-4 summarizes the calculated noise reductions and reasonable allowances for the barrier.

Table 7-4
SUMMARY OF REASONABLENESS DETERMINATION DATA—BARRIER NB-1[a]

Barrier I.D.: NB-1	
Receiver: R-5/R-6	
LOS C Noise Level without Barrier: 66 dBA L_{EQ}(h)	
LOS C Noise Level Minus Existing Noise Level: 0 dBA L_{EQ}(h)	
Feature	**6-Foot Barrier**
Barrier Noise Reduction, dB	9
Number of Benefited Residence	1
New Highway or More than 50% of Residences Predate 1978[b]	No
Reasonable Allowance Per Benefited Residence	$113,000
Total Reasonable Allowance	$113,000

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

7.2.1.2 Preliminary Analysis of Noise Control Barrer NB-2

Detailed modeling analysis was conducted for a barrier (NB-2) with a length of approximately 59 feet along the western periphery of the affected outdoor use areas between the use areas and the roadway, which would provide attenuation for receptors R-5 and R-6. A barrier height of seven feet was evaluated.

A reasonable allowance calculation sheet for this seven-foot-tall barrier is provided in Appendix B. Table 7-5 summarizes the calculated noise reductions and reasonable allowances for the barrier.

Table 7-5
SUMMARY OF REASONABLENESS DETERMINATION DATA—BARRIER NB-2[a]

Barrier I.D.: NB-2	
Receiver: R-5/R-6	
LOS C Noise Level without Barrier: 66 dBA L_{EQ}(h)	
LOS C Noise Level Minus Existing Noise Level: 0 dBA L_{EQ}(h)	
Feature	**7-Foot Barrier**
Barrier Noise Reduction, dB	7
Number of Benefited Residence	1
New Highway or More than 50% of Residences Predate 1978[b]	No
Reasonable Allowance Per Benefited Residence	$111,000
Total Reasonable Allowance	$111,000

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

7.2.2 City of Del Mar

The traffic noise modeling results in Tables 7-2 and 7-3 indicate that traffic noise levels at receptors R5 and R6 are predicted to be 67 CNEL under both the existing and future traffic scenarios. Because the predicted noise levels exceed the City's 65-CNEL exterior standard for residential uses, traffic noise impacts are predicted at these areas, and noise abatement is considered. The six-foot-tall barrier (NB-1) described above in Section 7.2.1.1 would provide a noise reduction of 9 dB, resulting in a noise level of 58 CNEL, which would be below the City's 65-CNEL standard. The seven-foot-tall barrier (NB-2) described above in Section 7.2.1.2 would provide a noise reduction of 7 dB, resulting in a noise level of 60 dB, which would be below the City's 65-CNEL standard.

CHAPTER 8 CONSTRUCTION NOISE

Both Caltrans and the City have established standards for construction noise. Section 14-8.02 (Noise Control) of Caltrans standard specifications provides information that can be considered in determining whether construction would result in adverse noise impacts. The specification states:

- Do not exceed maximum noise levels (L_{MAX}) of 86 dBA at 50 feet from the construction site from 9:00 p.m. to 6:00 a.m.; and

- Equip an internal combustion engine with the manufacturer-recommended muffler. Do not operate an internal combustion engine on the job site without the appropriate muffler.

Additionally, the City has established standards for construction noise at residentially zoned properties. Construction noise would be considered adverse if it would exceed 75 dBA averaged over a one-hour period. No construction is allowed on Sundays or City holidays, before 9:00 a.m. or after 7:00 p.m. on Saturday, or before 7:00 a.m. or after 7:00 p.m. on Monday through Friday.

The Project is estimated to be constructed over 27 months with five distinct construction stages: site preparation, demolition and replacement of east side of the bridge, demolition and replacement of west side of the bridge, bridge median improvements, and final improvements. A variety of standard construction equipment would be used, including, but not limited to, backhoes/loaders, excavators, tractors, dozers, concrete breakers, concrete saws, pile installation equipment, and miscellaneous trucks. Hourly average noise levels from construction at the Project site were determined using the Roadway Construction Noise Model (RCNM) (FHWA 2008). Individually, these pieces of construction equipment generate noise levels ranging from approximately 77 to 100 dBA L_{MAX} and from approximately 73 to 94 dBA L_{EQ} at a distance of 50 feet. Noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance. It is likely that multiple pieces of equipment would be operating simultaneously near each other, thus having the potential to combine to generate hourly average noise levels exceeding the Caltrans construction noise standard of 86 dBA L_{MAX} at 50 feet during nighttime or early morning hours (before 6:00 a.m. or after 9:00 p.m.).

Noise levels would also potentially exceed the City construction noise standard of 75 dBA L_{EQ} (1-hour) at nearby residences. The nearest residences to the Project construction area are along Camino del Mar south of the existing bridge and are located within 50 feet of the construction work areas. The existing

concrete walls between Camino del Mar and the residences on the western side of the roadway would partially reduce construction noise levels experienced at these residences; however, because the equipment that would be used would generally be taller than the wall, noise levels would still likely exceed the 75 dBA L_{EQ} (1-hour) standard. Further, there is no noise wall to provide attenuation for the residences on the eastern side of the roadway. In order to reduce noise levels at the nearby residents, Project construction would be required to comply with the standard construction best management practices listed below.

1. The construction contractor shall be required to work in such a manner so as not to exceed a 1-hour average sound level of 75 dBA at any noise-sensitive land use (residential). Sound levels may be limited by sound control devices, limited the number of equipment operating at once, or installation of temporary noise barriers between the construction site and sensitive receptors.

2. Construction equipment shall be properly outfitted and maintained with manufacturer recommended noise-reduction devices to minimize construction-generated noise.

3. Stationary construction noise sources such as generators or pumps shall be located at least 100 feet from noise-sensitive land uses as feasible.

4. Laydown and construction vehicle staging areas shall be located as far from noise-sensitive land uses as feasible.

With implementation of the above measures, construction noise levels would be less than significant under standards established by both the City and Caltrans.

CHAPTER 9 REFERENCES

California Department of Transportation (Caltrans)

2020 Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects. Sacramento, CA. August.

2013 Technical Noise Supplement for the Traffic Noise Protocol. September.

Federal Highway Administration (FHWA)

2008 Roadway Construction Noise Model.

2004 FHWA Traffic Noise Model, Version 2.5. February. FHWA-PD-96-010. Washington D.C.

STC Traffic, Inc.

2018 Transportation Impact Analysis Report for the Camino Del Mar Bridge Project. July.

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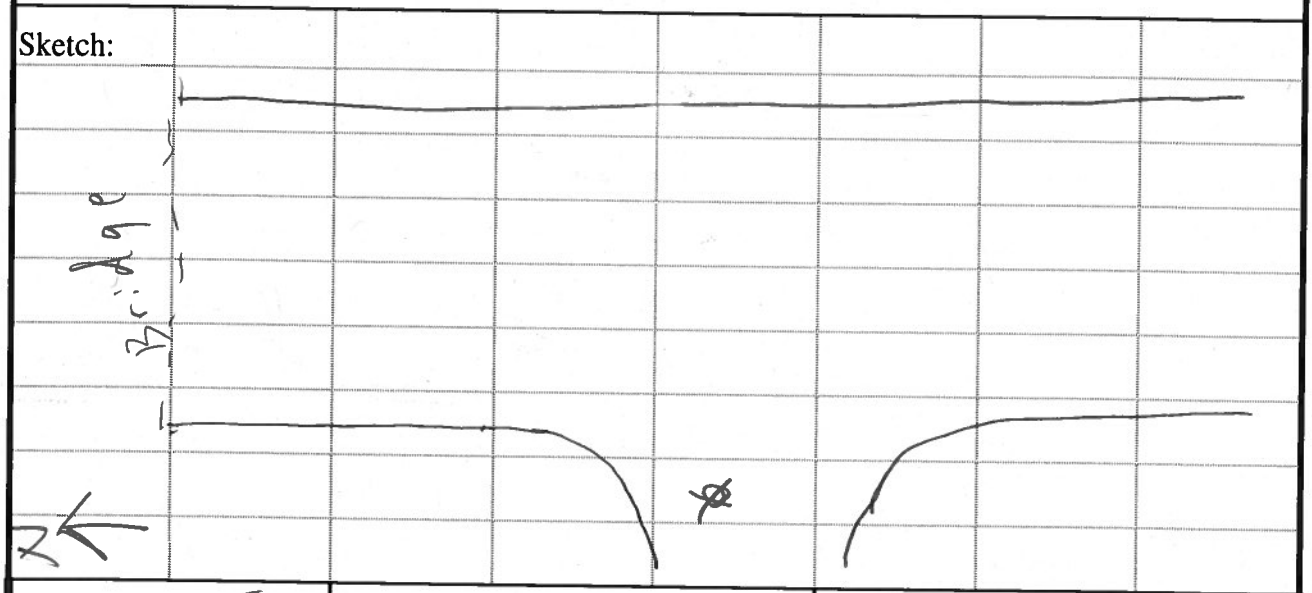
Appendix A
Short-term Noise Measurement Field Sheets

Site Survey

Project #	KLE 02.02			Project Name:	Camino Del Mar Ridge		
Date:	8/10/21	Site #:	1	Engineer:	Charles Terry ~~Brendan Sullivan~~		
Address:	Sandy Lane						
Meter:	LD 831	Serial #:	1741	Calibrator:	CA250	Serial #:	2330 ~~2621~~

Notes:

Sketch:



Temp:	75	Wind Spd:	0-1 mph	Humidity:	50 %
Start of Measurement:	11:46	End of Measurement:	12:01	63.2	dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
41 × 5 = 205	3	0
	111	

Noise Measurement for Information Only

No Through Roadways

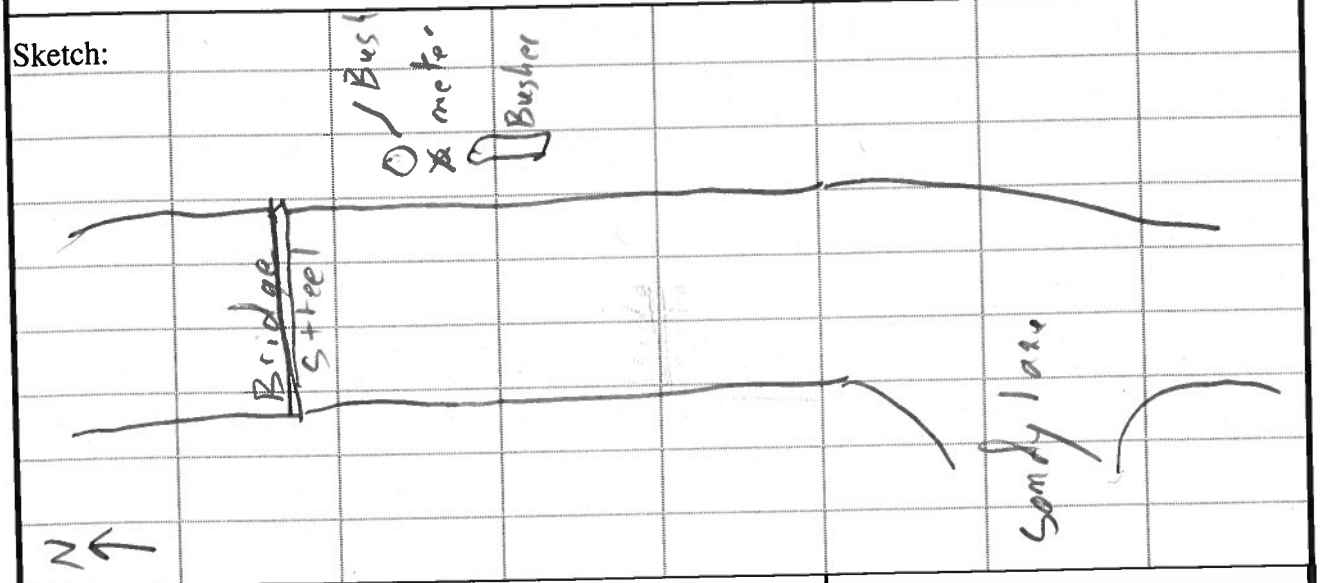
No Calibration Analysis Will Be Provided

Site Survey

Project #	KLF0202	Project Name:	Camino Del Mar Bridge Observation
Date:		Site #:	2
Engineer:	Brendan Sullivan		
Address:	East side of street 100' S of Bridge		
Meter:	LD 831	Serial #:	1741
Calibrator:	CA250	Serial #:	2621

Notes:

Sketch:



Temp:	75	Wind Spd:	01 mph	Humidity:	50 %
Start of Measurement:	12:08	End of Measurement:	12:23	63.7	dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
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Appendix B

Noise Barrier Reasonableness Analysis Worksheets

Worksheet A

Reasonable Allowance Calculation for Noise Abatement based on Critical Design Receiver

County: San Diego

Route: Camino Del Mar

Base Allowance				
Base Year	2019			$107,000
1) Absolute Noise Levels			Check One	
69 dBA or less:	Add:	$2,000	√	$2,000
70-74 dBA:	Add:	$4,000		$0
75-78 dBA:	Add:	$6,000		$0
More than 78 dBA:	Add:	$8,000		$0
2) Build vs. Existing Noise Levels			Check One	
Less than 3 dBA:	Add:	$0	√	$0
3-7 dBA:	Add:	$2,000		$0
8-11 dBA:	Add:	$4,000		$0
12 dBA or more:	Add:	$6,000		$0
3) Achievable Noise Reduction			Check One	
Less than 6 dBA:	Add:	$0		$0
6-8 dBA:	Add:	$2,000		$0
9-11 dBA:	Add:	$4,000	√	$4,000
12 dBA or more:	Add:	$6,000		$0
4) New Construction Or Pre 1978 residences? (Choose Yes or No)				
YES on either one:	Add:	$10,000		$0
NO on both:	Add:	$0	√	$0
Reasonable Allowance Per Residence				$113,000
Unmodified Barrier Allowance				$113,000
Adjusted reasonable allowance for Benefitted Residence				
Adjusted Unmodified Barrier Allowance				

Adjusted reasonable allowance for Residence and Barrier must be rounded up to the nearest $1,000

Barrier Name or ID	NB-1
Barrier Height (Feet)	6
Critical Design Receiver	R5/R6
Number of benefitted Residences (equivalent)	1
New Hwy Construction	No
Pre 1978 residences	No
Existing Noise Levels	66 dBA
Future Noise Levels	66 dBA
Changes in Noise Level	0 dBA increase
Noise Level with Abatement	57 dBA
Barrier Insertion Loss	9 dBA

Continue to Worksheet B

Worksheet B

Noise Barrier Reasonable Allowance Calculation

County: San Diego Route: Camino Del Mar

Construction Cost without abatement: TBD

From Worksheet A				Adjusted Barrier Allowance vs Construction Cost	Percentage of Total Barrier Allowance	Modified Barrier Allowance	Modified Allowance Benefitted Residence
Barrier ID	Adjusted Allowance for Critical Design Receiver	Number of Benefitted Residences	Adjusted Unmodified Barrier Allowance		(col 4: A/ΣA)	(A/ΣA x .5 x Const Cost)	(col 7/col 3)
NB-1	$113,000	1	$113,000	The total unmodified barrier allowance (column 4) is less than 50% of the construction cost without abatement, therefore no allowance modification is required.			
	Totals	1	$113,000				
1	2	1	4	5	6	7	8

Worksheet A

Reasonable Allowance Calculation for Noise Abatement based on Critical Design Receiver

County: San Diego

Route: Camino Del Mar

Base Allowance				
Base Year	2019			$107,000
1) Absolute Noise Levels			Check One	
69 dBA or less:	Add:	$2,000	√	$2,000
70-74 dBA:	Add:	$4,000		$0
75-78 dBA:	Add:	$6,000		$0
More than 78 dBA:	Add:	$8,000		$0
2) Build vs. Existing Noise Levels			Check One	
Less than 3 dBA:	Add:	$0	√	$0
3-7 dBA:	Add:	$2,000		$0
8-11 dBA:	Add:	$4,000		$0
12 dBA or more:	Add:	$6,000		$0
3) Achievable Noise Reduction			Check One	
Less than 6 dBA:	Add:	$0		$0
6-8 dBA:	Add:	$2,000	√	$2,000
9-11 dBA:	Add:	$4,000		$0
12 dBA or more:	Add:	$6,000		$0
4) New Construction Or Pre 1978 residences? (Choose Yes or No)				
YES on either one:	Add:	$10,000		$0
NO on both:	Add:	$0	√	$0
Reasonable Allowance Per Residence				$111,000
Unmodified Barrier Allowance				$111,000
Adjusted reasonable allowance for Benefitted Residence				
Adjusted Unmodified Barrier Allowance				

Barrier Name or ID	NB-2
Barrier Height (Feet)	7
Critical Design Receiver	R5/R6
Number of benefitted Residences (equivalent)	1
New Hwy Construction	No
Pre 1978 residences	No
Existing Noise Levels	66 dBA
Future Noise Levels	66 dBA
Changes in Noise Level	0 dBA increase
Noise Level with Abatement	59 dBA
Barrier Insertion Loss	7 dBA

Continue to Worksheet B

Adjusted reasonable allowance for Residence and Barrier must be rounded up to the nearest $1,000

Worksheet B

Noise Barrier Reasonable Allowance Calculation

County: San Diego Route: Camino Del Mar

Construction Cost without abatement: TBD

From Worksheet A				Adjusted Barrier Allowance vs Construction Cost	Percentage of Total Barrier Allowance	Modified Barrier Allowance	Modified Allowance Benefitted Residence
Barrier ID	Adjusted Allowance for Critical Design Receiver	Number of Benefitted Residences	Adjusted Unmodified Barrier Allowance		(col 4: A/ΣA)	(A/ΣA x .5 x Const Cost)	(col 7/col 3)
NB-2	$111,000	1	$111,000	The total unmodified barrier allowance (column 4) is less than 50% of the construction cost without abatement, therefore no allowance modification is required.			
	Totals	1	$111,000				
1	2	1	4	5	6	7	8

Appendix J

Transportation Impact Analysis Report

Camino Del Mar Bridge Project

Transportation Impact Analysis Report

Prepared for:
City of Del Mar

July 2018

Prepared By:
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1 INTRODUCTION

The Camino Del Mar Bridge project will replace the existing bridge located over the San Dieguito River within the City of Del Mar. STC Traffic Inc. conducted a transportation impact analysis for the existing and future year conditions, which is included in this transportation impact analysis report. Construction related impacts associated with the project were also evaluated.

1.1 Project Description

The Camino Del Mar bridge over the San Dieguito River is located within the City of Del Mar, west of Interstate 5, south of Via De La Valle and north of 29th Street. The new bridge structure is proposed to include one travel lane and one buffered bike lane in each direction. The new bridge is also proposed to include protected sidewalk on both sides of the bridge and a center median. This transportation impact analysis report evaluates the proposed lane configuration of the bridge for the future year 2040 traffic volume.

This transportation impact analysis report also evaluates the impacts during construction due to the potential diversion of traffic. Two construction scenarios are considered in this analysis; staged construction with reduced travel lanes and full closure. For the staged construction scenario, the bridge shall remain in service throughout the demolition and replacement period, with two-way traffic maintained at all times. As one side of the bridge is worked on, the traffic will be rerouted to the other side of the bridge with reduced width travel lanes and removal of the bike lanes. For the full closure construction scenario, traffic will be detoured to Via De La Valle, Jimmy Durante Boulevard, or Interstate 5. Impacts on all modes of travel: vehicle, bicycle and pedestrian were evaluated in this report. **Figure 1-1** illustrates the regional project location.

1.2 Proposed Bridge Configuration

The proposed bridge will widen the currently narrow travel lanes to 12 feet wide. Bike lanes with buffer will be striped in each direction. The new bridge will include a striped center median instead of a raised median as currently present. This will provide the flexibility to change the lane configuration in the future, if required. The proposed bridge will provide a wide sidewalk on the west side of the bridge. The new bridge will provide a 5 feet sidewalk on the east side of the bridge, which currently does not exist. After the construction of the bridge, the existing transit stops will remain unchanged.

1.3 Study Area

This transportation impact analysis report addresses potential operational impacts that could result from the project on the local circulation system. The study area contains intersections and roadway segments that could be impacted primarily due to the detoured traffic during construction. A total of six (6) study intersections and five (5) roadway segments were evaluated. **Figure 1-2** illustrates the project study area.

Intersections

1. Highway 101-Camino Del Mar / Via De La Valle
2. Camino Del Mar / Coast Boulevard
3. Camino Del Mar / L'Auberge Del Mar
4. Camino Del Mar / 15th Street
5. Jimmy Durante Boulevard / Via De La Valle
6. Jimmy Durante Boulevard / San Dieguito Drive

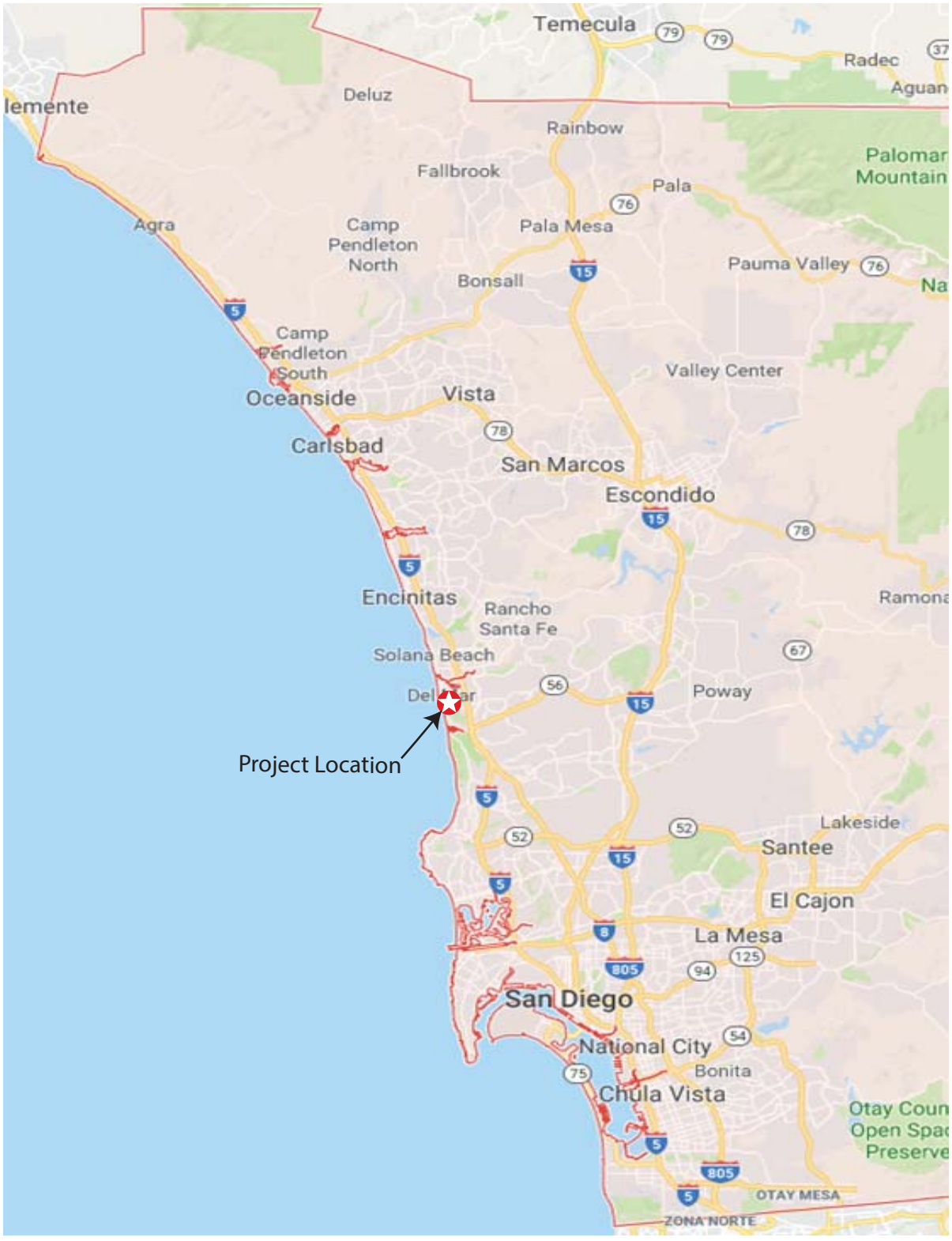
Roadway Segments

1. Camino Del Mar, from Via De La Valle to Coast Boulevard
2. Camino Del Mar, from Coast Boulevard to Jimmy Durante Boulevard
3. Jimmy Durante Boulevard, from Via De La Valle to South Fair Access
4. Jimmy Durante Boulevard, from South Fair Access to Camino Del Mar
5. Via De La Valle, from Highway 101 to Jimmy Durante Boulevard

1.4 Study Scenarios

The following study scenarios are evaluated in this transportation impact analysis report:

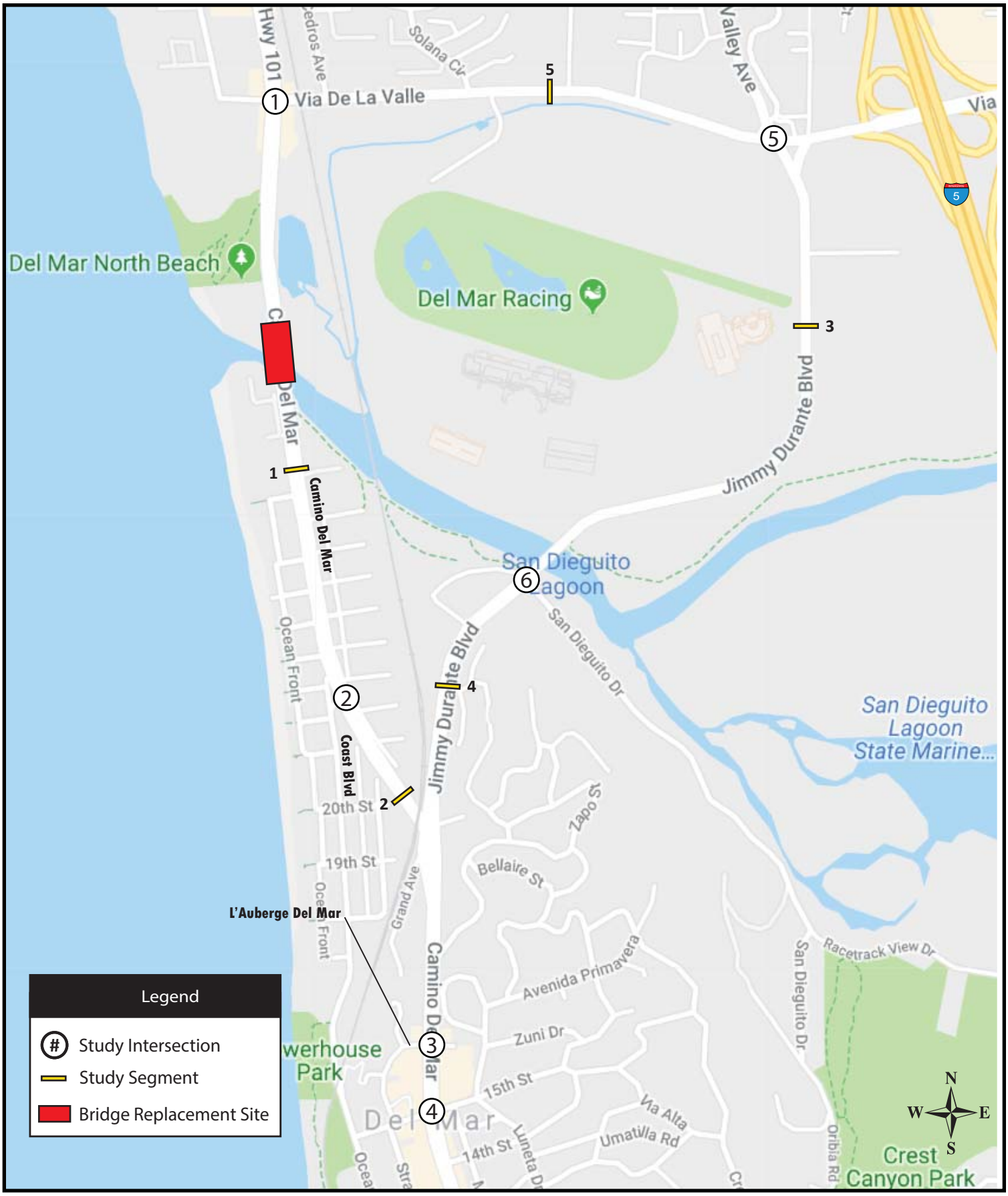
- **Existing Conditions:** This scenario reflects the conditions on the ground at the time the traffic volume data was obtained (April and May 2018).
- **Horizon Year 2040 Conditions:** This scenario reflects the Horizon Year 2040 roadway conditions with the bridge being fully built and operational.
- **Existing Plus Construction Conditions:** This scenario reflects the anticipated roadway conditions during the construction of the bridge due to detoured traffic.



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Figure 1-1
Regional Project Location

Camino Del Mar Bridge



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Figure 1-2
Project Study Area

2 METHODOLOGY

This transportation impact analysis report was prepared consistent with the SANTEC/ITE regionally accepted *Traffic Impact Study Guidelines* (2000), with methodology concurrence provided by the City of Del Mar. The following section summarizes the analysis methodology applied to intersections and roadway segments for the study scenarios evaluated.

2.1 Intersection Level of Service Analysis

In compliance with the SANTEC/ITE *Traffic Impact Study Guidelines*, intersections within the study area were evaluated using the *Highway Capacity Manual (HCM)* operation methodology for signalized and unsignalized intersections. The all-way-stop controlled intersection was evaluated using the HCM 2010 methodology. Due to limitations in the HCM 2010, the signalized intersections were evaluated using the 2000 HCM methodology. Operations of both signalized and unsignalized intersections were analyzed with Synchro 9 software, which uses the methodologies outlined in the 2000 and 2010 *Highway Capacity Manual (HCM)* to calculate delay and the associated levels of service. **Table 2-1**: provides the signalized and unsignalized intersection level of service descriptions and thresholds as described in the 2000 and 2010 HCM.

TABLE 2-1: SIGNALIZED AND UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Signalized Intersection Delay (sec)	Unsignalized Intersection Delay (sec)
A	Free flow	≤10	≤10
B	Stable Flow (slight Delay)	>10 and ≤20	>10 and ≤15
C	Stable Flow (acceptable Delay)	>20 and ≤35	>15 and ≤25
D	Approaching Unstable Flow (tolerable Delay)	>35 and ≤55	>25 and ≤35
E	Unstable Flow (intolerable Delay)	>55 and ≤80	>35 and ≤50
F	Forced Flow (jam condition)	>80	>50

Source: *2000 & 2010 Highway Capacity Manual.*

2.2 Roadway Segment Level of Service Analysis

The basis for analysis of roadway segment performance is provided by LOS standards and thresholds. The LOS analysis considerations include the functional classification of the roadway, maximum capacity, roadway geometrics, and Average Daily Traffic (ADT) volumes. The analysis results provide a quick overview of whether a segment is under, approaching, or over capacity.

A daily roadway segment analysis was conducted for all study area roadway segments using the volume-to-capacity (v/c) ratio methodology, in accordance with SANTEC/ITE *Traffic Impact Study Guidelines* (2000). **Table 2-2** presents the roadway segment capacity and LOS standards utilized by the City of Del Mar.

TABLE 2-2: ROADWAY SEGMENT CAPACITY & LOS CRITERIA

Roadway Classification	Lanes	LOS A	LOS B	LOS C	LOS D	LOS E
Collector	4	< 10,000	< 14,000	< 20,000	< 25,000	< 30,000
Collector	2	< 5,000	< 7,000	< 10,000	< 13,000	< 15,000

Source: *SANTEC/ITE Guidelines for Traffic Impact Study in the San Diego Region, 2000*

2.3 Thresholds of Significance

Table 2-3 summarizes the thresholds of significance for intersections and segments as defined in the SANTEC/ITE *Traffic Impact Study Guidelines* (2000) and accepted by City of Del Mar for use in this project.

TABLE 2-3: THRESHOLDS OF SIGNIFICANCE

Facility	Without Project LOS	With Project LOS	Threshold of Significance	Impact Type
Intersection	LOS D	LOS E/F	Change from Acceptable to Deficient	Existing: Direct Impact Future: Cumulative Impact
	LOS E/F	LOS E/F	> 2.0 seconds of delay	Existing: Direct Impact Future: Cumulative Impact
Roadway Segment	LOS D	LOS E/F	Change from Acceptable to Deficient	Existing: Direct Impact Future: Cumulative Impact
	LOS E/F	LOS E/F	> 0.02 change in V/C	Existing: Direct Impact Future: Cumulative Impact

Source: *SANTEC/ITE Guidelines for Traffic Impact Study in the San Diego Region, 2000*

3 EXISTING CONDITIONS

The following section summarizes the existing conditions of the transportation system within the study area as well as the operational assessment of existing intersections and roadway segments. Existing conditions intersection geometries are provided in **Figure 3-1**. Pedestrian, bicycle and transit facilities within the study area are illustrated in **Figure 3-2**.

3.1 Roadway Network

The following paragraphs describe the conditions of the existing roadway network.

Camino Del Mar between Via De La Valle and Jimmy Durante Boulevard is a 2-Lane Collector with a center raised median through the study area, that generally runs in the north-south direction. The street name changes to Highway 101 north of Via De La Valle. The posted speed limit is 40 mph. Dedicated left turn lanes are provided at major driveways and cross streets. On-street parking is provided for most of the roadway in the residential neighborhood and adjacent to the beach.

Camino Del Mar between Jimmy Durante Boulevard and 15th Street is a 4-Lane Collector with a center raised median. Parking is permitted intermittently along the east side of the street between L'Auberge Del Mar and 15th Street. The posted speed limit between L'Auberge Del Mar and 15th Street is 25 mph.

Jimmy Durante Boulevard generally runs in the north-south direction and is a 4-Lane Collector with a center two-way-left-turn-lane (TWLTL) between Via De La Valle and the south gate of the Del Mar Fairgrounds. The posted speed limit is 45 mph. The number of lanes south of the south gate reduces to 2 lanes and the roadway is undivided. The street between San Dieguito Drive and Camino Del Mar is a 2- Lane Collector with raised median. The posted speed limit is 40 mph.

Via De La Valle between Jimmy Durante Boulevard and Camino Del Mar-Highway 101 is a 2-Lane Collector and runs in the east-west direction. Parking is permitted on both sides of the street. The posted speed limit is 45 mph.

15th Street runs in the east-west direction and is a 2-Lane Collector with a center raised median east of Camino Del Mar. The street west of Camino Del Mar is undivided and parking is permitted on both sides of the street.

3.2 Pedestrian Facilities

Sidewalks are provided along both sides of Camino Del Mar between Via De La Valle and Coast Boulevard except on the east side of the Camino Del Mar bridge. Marked crosswalks are provided on both the north and south ends of the bridge for connectivity. There is no sidewalk on Camino Del Mar between Coast Boulevard and Jimmy Durante Boulevard. Sidewalk are provided on the east side of Camino Del Mar between Jimmy Durante Boulevard and L'Auberge Del Mar. Sidewalk are provided on both sides along Camino Del Mar between L'Auberge Del Mar and 15th Street.

Along Jimmy Durante Boulevard a sidewalk is provided on both sides of the street between Via De La Valle and the underpass. Between the underpass and the gate south of the main entrance to the fairgrounds, a sidewalk is provided on the west side of the street. Sidewalk are provided on both sides between the gate south of the main entrance and San Dieguito Drive. Sidewalk is provided only on the east side between San Dieguito Drive and Camino Del Mar.

Along Via De La Valle, sidewalk are provided on both sides between Highway 101 – Camino Del Mar and Jimmy Durante Boulevard.

3.3 Bicycle Facilities

Class II bicycle lanes are provided in both directions along Camino Del Mar, Jimmy Durante Boulevard, and Via De La Valle. Buffered bike lanes are provided along portions of Camino Del Mar.

3.4 Local & Regional Transit Service

North County Transit District (NCTD) operates the local transit service within the City of Del Mar. NCTD's Route 101 serves bus stops along Camino Del Mar and currently travels along the stretch of Camino Del Mar between Via De La Valle and Jimmy Durante Boulevard. It provides daily service from Oceanside to the University Towne Center area in the City of San Diego. Service is provided Monday through Friday and on weekends and holidays. According to the NTCD website, the average headway is approximately 30 minutes from 5:00AM to 7:00PM daily with longer headways between 7:00PM and 10:00PM. No service along Camino Del Mar is provided between 10:00PM and 5:00AM.

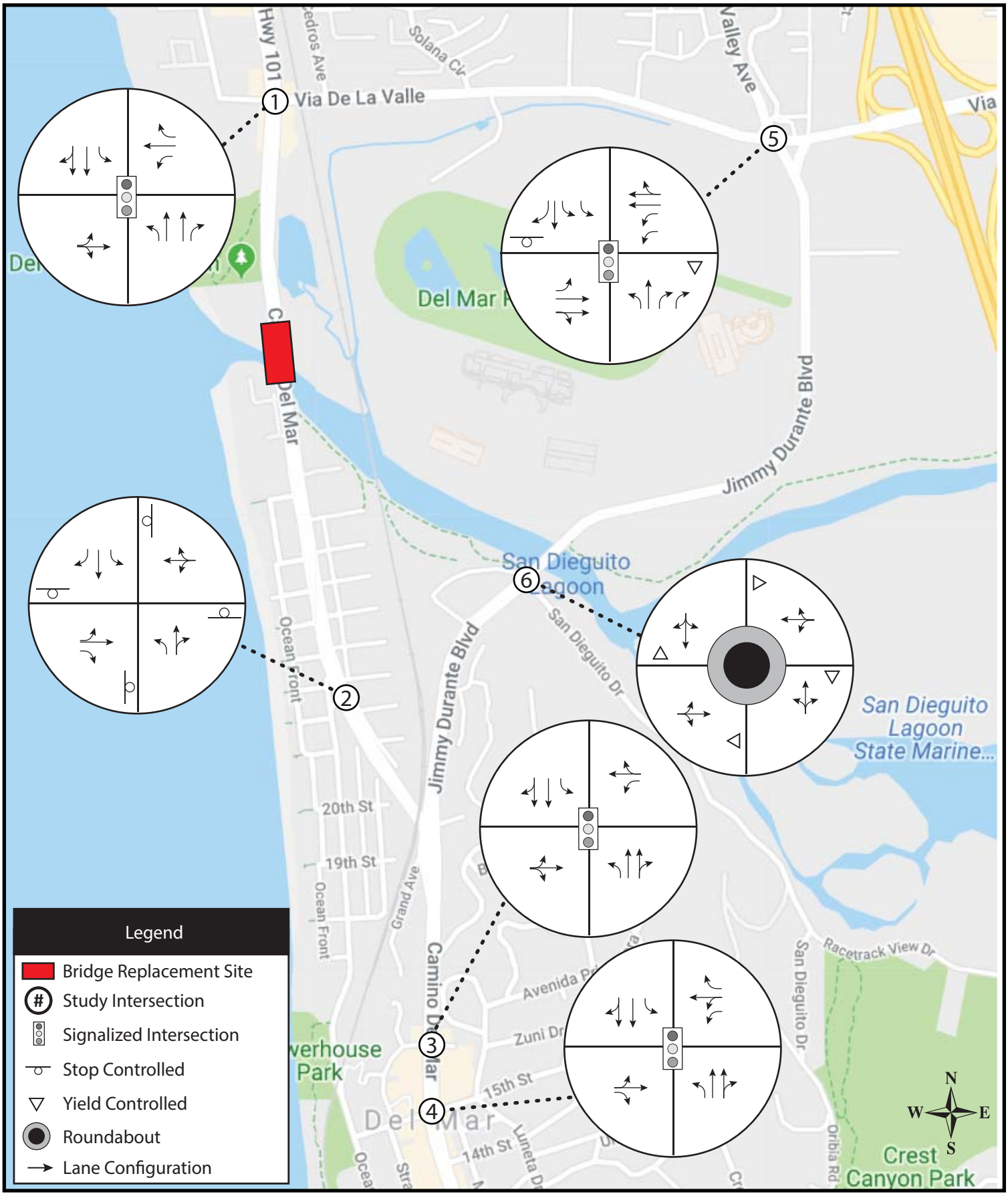
There are two (2) bus stops on Highway 101 with one on either side of the street, north of Villa De La Valle. Along Camino Del Mar, there are four (4) bus stops with two (2) on either of the street between Via Del La Valle and Coast Boulevard. There are two (2) bus stops with one on either side of the street between L'Auberge Del Mar and 15th Street.

There are no bus route serving Via De La Valle and Jimmy Durante Boulevard within the project area.

3.5 Existing Intersection and Roadway Volumes

Traffic volumes at the study area intersections were collected in April and May 2018 for the AM peak period (7:00 AM to 9:00 AM) and PM peak period (4:00 PM to 6:00 PM) during typical weekday conditions with schools in session. Daily volumes on the study area roadway segments were collected in April 2018 over a 24-hour period in both directions of travel. The AM/PM peak hour intersection volumes and daily roadway segment volumes are illustrated in **Figure 3-3.** Traffic count data are included in **Appendix A**.

Camino Del Mar Bridge



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Figure 3-1
Existing Intersection Geometrics

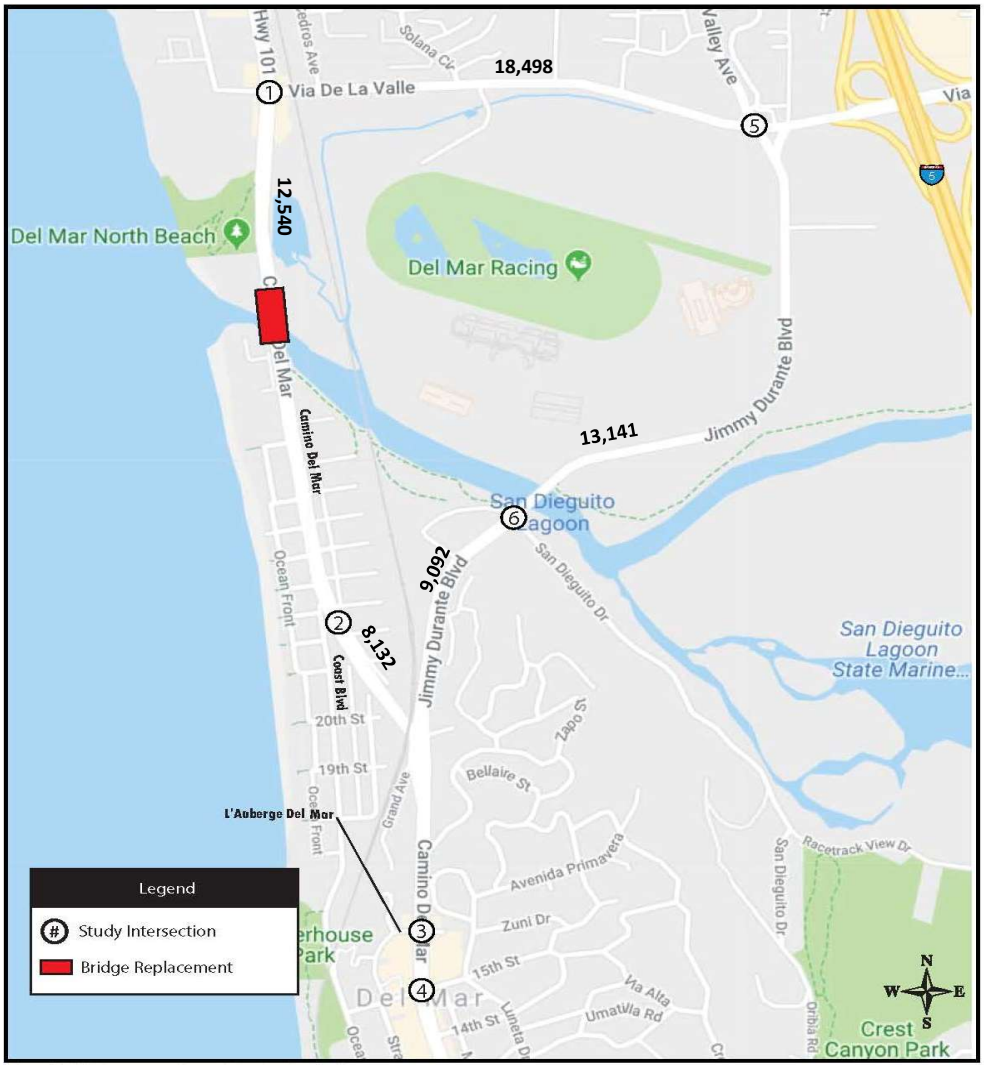
Camino Del Mar Bridge



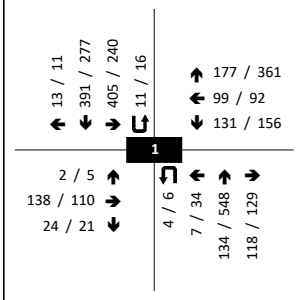
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Figure 3-2
Existing Pedestrian, Bicycle and Transit Facilities

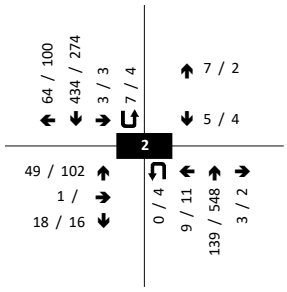
Camino Del Mar Bridge



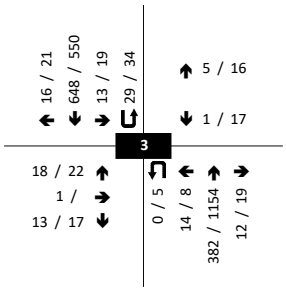
Highway 101 / Camino Del Mar @ Via De La Valle / Border Ave



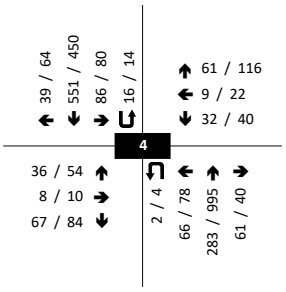
Camino Del Mar @ Court St / Coast Blvd



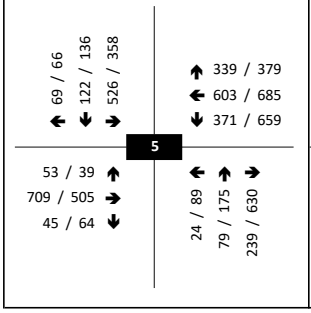
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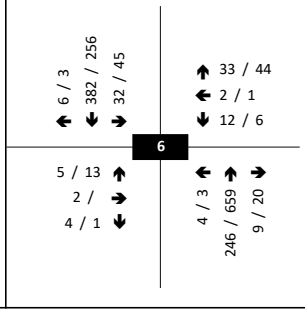
Camino Del Mar @ 15th St



Valley Ave / Jimmy Durante Blvd @ Via De La Valle



Jimmy Durante Blvd @ San Dieguito Dr



LEGEND

xx / yy = AM / PM Peak-Hour Turning Movement Volumes

X,XXX = ADT Volume

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Exhibit 3-3

Existing Traffic Volumes

3.6 Intersection Analysis

Levels of service (LOS) were determined at the study area intersections for the AM and PM peak hours. The AM intersection analysis evaluates the LOS during the hour with the highest vehicular traffic between 7:00 AM and 9:00 AM. The PM intersection analysis evaluates the LOS during the hour with the highest vehicular traffic between 4:00 PM and 6:00 PM.

Signal timing data parameters including cycle lengths, splits, clearance intervals, etc. used in this analysis were based on the current signal timing sheets provided by the City and calibrated into the Synchro model. **Table 3-1** presents the existing conditions peak hour intersection operational analysis.

As shown in Table 3-1, the study intersections currently operate at an acceptable level of service (LOS) D or better during both the AM and PM peak hours, except for the intersection of Camino Del Mar / Coast Boulevard, which operates at unacceptable LOS E during the PM peak hour. HCM analysis worksheets are provided in **Appendix B.**

TABLE 3-1: EXISTING INTERSECTION PEAK HOUR LOS SUMMARY

Intersection		Traffic Control	Peak Hour	Existing Conditions	
				Delay[a] (sec)	LOS
1	Hwy 101 & Camino Del Mar / Via De La Valle	Signal [b]	AM	20.5	C
			PM	22.6	C
2	Camino Del Mar / Coast Blvd	AWSC [c]	AM	13.7	B
			PM	35.8	**E**
3	Camino Del Mar & L'Auberge Del Mar / Plaza Parking	Signal [b]	AM	6.5	A
			PM	11.5	B
4	Camino Del Mar / 15th St	Signal [b]	AM	16.7	B
			PM	24.4	C
5	Jimmy Durante Blvd / Via De La Valle	Signal [b]	AM	38.4	D
			PM	46.4	D
6	Jimmy Durante Blvd / San Dieguito Dr	Roundabout [c]	AM	6.9	A
			PM	11.0	B

Notes:

Signal: Traffic signal, AWSC: all-way stop control

(a) Delays are reported as the average control Delay for the entire intersection at signalized intersections and average Delay for all-way stop controlled and roundabout intersections.

(b) Delay and LOS calculations are based on the methodology outlined in the 2000 Highway Capacity Manual (HCM).

(c) Delay and LOS calculations are based on the methodology outlined in the 2010 Highway Capacity Manual (HCM).

3.7 Roadway Segment Analysis

Table 3-2 summarizes the daily operations of the study area roadway segments under Existing Conditions. As shown in Table 3-2, all the study roadway segments currently operate at an acceptable LOS D or better except for Via De La Valle which operate at unacceptable LOS F.

TABLE 3-2: EXISTING ROADWAY SEGMENT LOS SUMMARY

Segment	Lanes / Functional Classification	Daily Capacity	Existing Conditions		
			ADT	V/C Ratio	LOS
Camino Del Mar					
Via De La Valle to Coast Blvd.	2-Lane Collector	15,000	12,540	0.836	D
Coast Blvd to Jimmy Durante Blvd.	2-Lane Collector	15,000	8,312	0.554	C
Jimmy Durante Boulevard					
Via De La Valle to South Fair Access	4-Lane Collector	30,000	13,141	0.438	B
South Fair Access to Camino Del Mar	2-Lane Collector	15,000	9,092	0.606	C
Via De La Valle					
Hwy 101-Camino Del Mar to Jimmy Durante Blvd.	2-Lane Collector	15,000	18,498	1.233	**F**

V/C = Volume to Capacity Ratio

4 HORIZON YEAR 2040 CONDITIONS ANALYSIS

The following section summarizes the operating conditions of the study area intersections and roadway segments for the Horizon Year 2040 conditions with the Camino Del Mar bridge improvements.

4.1 Roadway Network and Geometry

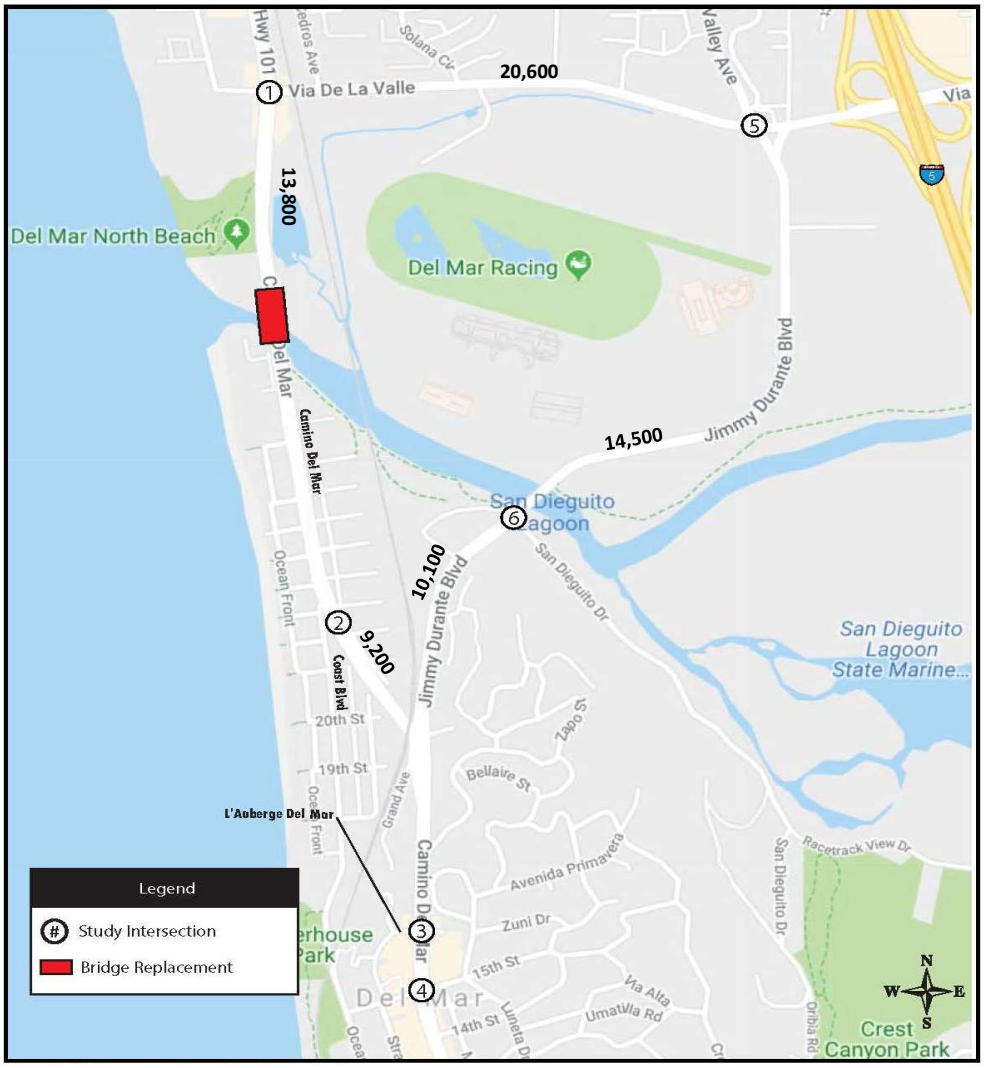
No changes to the roadway network was assumed for the Horizon Year 2040 conditions. No changes to the intersection and roadway segment geometries was assumed for the Horizon Year 2040 conditions. The proposed bridge project will retain the number of lanes currently provided on the existing Camino Del Mar bridge. The project will not increase vehicular capacity on the bridge.

4.2 Forecast Year 2040 Traffic Volumes

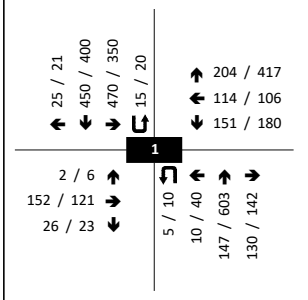
Horizon Year 2040 volumes were determined based on the SANDAG Series 12 regional traffic model. A more current version (Series 13) traffic model was available. The Series 13 model reported lower ADT volumes within the study area compared to the Series 12 model. To be conservative, the volumes reported in the Series 12 model were used. The model accounts for the future growth in the City of Del Mar as well as the surrounding communities. The Series 12 Year 2050 model assumes the existing two-lane capacity for the Camino Del Mar south of Via De La Valle.

The Year 2040 ADT volume was obtained by interpolating between the base Year 2008 model ADT and future Year 2050 model ADT. The Horizon Year 2040 ADT were then post-processed to develop the peak hour intersection volumes. The Horizon Year 2040 baseline peak hour intersection volumes were developed using the forecast growth between the existing and year 2040 volumes. The SANDAG Series 12 model and growth calculations are included in **Appendix C**. The Horizon Year 2040 conditions peak hour and roadway segment volumes are presented in **Figure 4-1.**

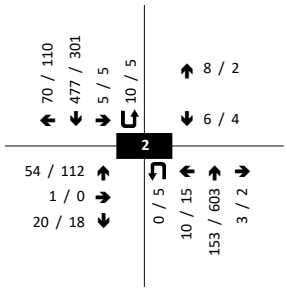
Camino Del Mar Bridge



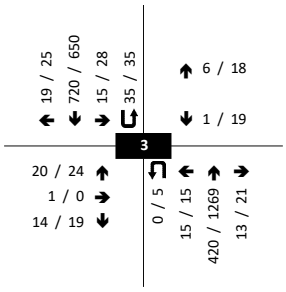
Highway 101 / Camino Del Mar @ Via De La Valle / Border Ave



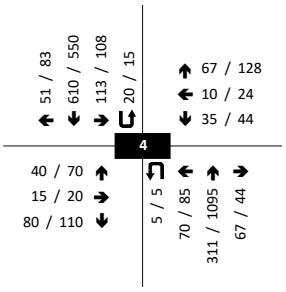
Camino Del Mar @ Court St / Coast Blvd



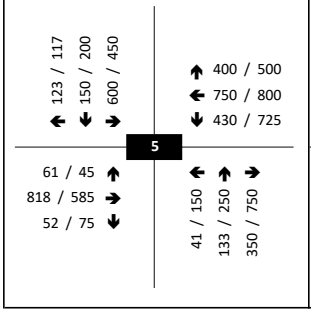
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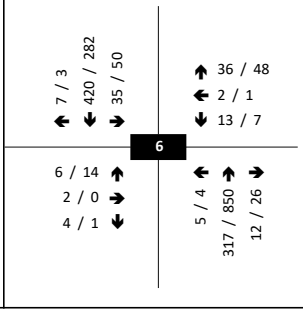
Camino Del Mar @ 15th St



Valley Ave / Jimmy Durante Blvd @ Via De La Valle



Jimmy Durante Blvd @ San Dieguito Dr



LEGEND

xx / yy = AM / PM Peak-Hour Turning Movement Volumes

X,XXX = ADT Volume

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Exhibit 4-1

Horizon Year 2040 Traffic Volumes

4.3 Intersection Analysis

Levels of service (LOS) were determined at the study area intersections for the AM and PM peak hours for the Horizon Year 2040 conditions and are presented in **Table 4-1.** Level of service analysis worksheets are provided in **Appendix D.**

TABLE 4-1: HORIZON YEAR 2040 CONDITIONS PEAK-HOUR INTERSECTION LOS SUMMARY

Intersection		Traffic Control	Peak Hour	Horizon Year 2040 Conditions	
				Delay[a] (sec)	LOS
1	Hwy 101 & Camino Del Mar / Via De La Valle	Signal [b]	AM	25.8	C
			PM	26.5	C
2	Camino Del Mar / Coast Blvd	AWSC [c]	AM	15.8	C
			PM	56.9	**F**
3	Camino Del Mar & L'Auberge Del Mar / Plaza Parking	Signal [b]	AM	6.6	A
			PM	16.0	B
4	Camino Del Mar / 15th St	Signal [b]	AM	17.9	B
			PM	27.2	C
5	Jimmy Durante Blvd / Via De La Valle	Signal [b]	AM	54.5	D
			PM	60.1	**E**
6	Jimmy Durante Blvd / San Dieguito Dr	Roundabout [c]	AM	7.6	A
			PM	20.2	C

Notes:

Signal: Traffic signal, AWSC: all-way stop control

(a) Delays are reported as the average control Delay for the entire intersection at signalized intersections and average Delay for all-way stop controlled and roundabout intersections.

(b) Delay and LOS calculations are based on the methodology outlined in the 2000 Highway Capacity Manual (HCM).

(c) Delay and LOS calculations are based on the methodology outlined in the 2010 Highway Capacity Manual (HCM).

As shown in the Table 4-1, all the study intersections operate at LOS D or better for both the AM and PM peak hour under the Horizon Year 2040 conditions, except for the following intersection:

2. Camino Del Mar / Coast Boulevard – LOS F (PM peak hour)
5. Jimmy Durante Blvd / San Dieguito Dr – LOS E (PM peak hour)

These intersections are forecast to operate at a deficient LOS by year 2040 without or with the proposed project. Construction of the bridge has no direct or cumulative impacts to these intersections.

4.4 Roadway Segment Analysis

Table 4-2 summarizes the daily operations of the study area roadway segments under Horizon Year 2040 Conditions.

TABLE 4-2: HORIZON YEAR 2040 CONDITIONS DAILY ROADWAY SEGMENT LOS SUMMARY

Segment	Lanes / Functional Classification	Daily Capacity	Year 2040 Conditions		
			ADT	V/C Ratio	LOS
Camino Del Mar					
Via De La Valle to Coast Blvd.	2-Lane Collector	15,000	13,800	0.920	**E**
Coast Blvd to Jimmy Durante Blvd.	2-Lane Collector	15,000	9,200	0.613	C
Jimmy Durante Boulevard					
Via De La Valle to South Fair Access	4-Lane Collector	30,000	14,500	0.483	C
South Fair Access to Camino Del Mar	2-Lane Collector	15,000	10,100	0.673	D
Via De La Valle					
Hwy 101-Camino Del Mar to Jimmy Durante Blvd.	2-Lane Collector	15,000	20,600	1.373	**F**

V/C = Volume to Capacity Ratio

As shown in Table 4-2, all the study roadway segments operate at acceptable LOS D or better except for the following segments:

- Camino Del Mar between Via De La Valle and Coast Blvd. – LOS E
- Via De La Valle between Hwy 101-Camino Del Mar and Jimmy Durante Blvd. – LOS F

It should be noted that these segments operate at deficient LOS without or with the proposed bridge project.

The maximum capacity to maintain LOS D or better operating conditions on the bridge is 13,000 vehicles per day. As shown in Table 4-2, the future forecast volumes along Camino Del Mar across the bridge exceed the available capacity by 800 vehicles per day. Providing four lanes across the bridge is constrained on the southbound approach as Camino Del Mar is two lanes with a raised median south of the bridge. However, northbound Camino Del Mar widens approaching Via De La Valle. The PM peak period conditions shows the northbound movement is the peak direction and is higher than the volume in the AM peak. Since the bridge is proposing a striped median, it may be feasible to restripe the bridge in the future to provide two northbound lanes and one southbound lane, resulting in a capacity of approximately 20,000 vehicles per day at LOS D. This restripe would mitigate forecast LOS E conditions on the bridge.

5 CONSTRUCTION CONDITIONS ANALYSIS

The Construction Conditions analysis summarizes the study area intersection and roadway segment operating conditions during the demolition and reconstruction of the Camino Del Mar bridge. Following are two construction scenarios that were evaluated in this transportation impact analysis report:

- **Staged Construction Scenario:** This bridge construction scenario would occur in three stages while maintaining one lane of traffic in each direction during construction. Stage 1 construction would close the existing west half of the bridge and reroute the traffic to the east half of the existing bridge. The existing median would be retained as a sidewalk for pedestrian use. Bicycle lanes would be removed and "Share the Road" signs would be installed. Stage 2 construction would close the east half of the existing bridge and reroute the traffic to the west half of the new bridge. The newly constructed west half of the bridge would consist of a pedestrian / bicyclist shared path. During Stage 2 construction, bicyclists would share the road with the vehicular traffic in both directions. Stage 3 construction would close the median of the new bridge and traffic will be maintained in both directions. This stage would maintain one vehicle and one buffered bike lane in each direction. Sidewalk would also be open on both sides of the bridge during Stage 3 construction. During all the three stages of construction, the bus route serving Camino Del Mar between Via De La Valle and Jimmy Durante Boulevard would not be affected. The staged construction scenario is anticipated to take approximately 24 months. **Figure 5-1** through **Figure 5-3** illustrates the conceptual traffic control plan for the three construction stages.

- **Full Bridge Closure (Long-Term Closure) Construction Scenario:** This bridge construction scenario would close the entire segment of the bridge to all modes of travel (vehicle, bus, bicyclists and pedestrians). Under this construction scenario all traffic would be detoured to Via De La Valle, Jimmy Durante Boulevard and Interstate 5. The full bridge closure construction scenario is anticipated to take approximately 12 months. During this construction scenario, the businesses and residences between the south end of the bridge and Jimmy Durante Boulevard would use Camino Del Mar and Jimmy Durante Boulevard to head north. During this construction scenario, beach and restaurant access between Via De La Valle and the bridge would be maintained from Camino Del Mar. A turn around would be provided north and south of the bridge construction site for vehicles to take a U-turn. **Figure 5-4** illustrates the conceptual detour map for the full bridge closure construction scenario.

5.1 Traffic Volumes

This section summarizes the assumptions to derive traffic volumes for each of the two bridge construction scenarios. Based on the existing volumes along Camino Del Mar and Jimmy Durante Boulevard, it was observed that the peak direction during the AM peak hour is in the southbound direction and in the northbound direction during the PM peak hour. Along Via De La Valle, the peak direction in the AM peak hour was observed to be in the eastbound direction and in the westbound direction during the PM peak hour.

- **Staged Construction Scenario:** For this construction scenario, traffic in both directions would be maintained during all the three stages of construction. To avoid delays due to construction, it is assumed that some traffic in the southbound direction during the AM peak hour (peak direction traffic) and both direction during the PM peak hour would divert to Interstate 5 and Jimmy Durante Boulevard. With stop-controlled intersections south of the bridge at 27th Street / Camino Del Mar and Coast Boulevard-Court Street / Camino Del mar, traffic traveling in the northbound direction will be metered causing less delay through the construction zone. With low northbound traffic volumes, the construction delay would likely be negligible, and diversion would result in an increased travel time. Hence diversion for northbound traffic was not considered during the AM peak hour for this construction

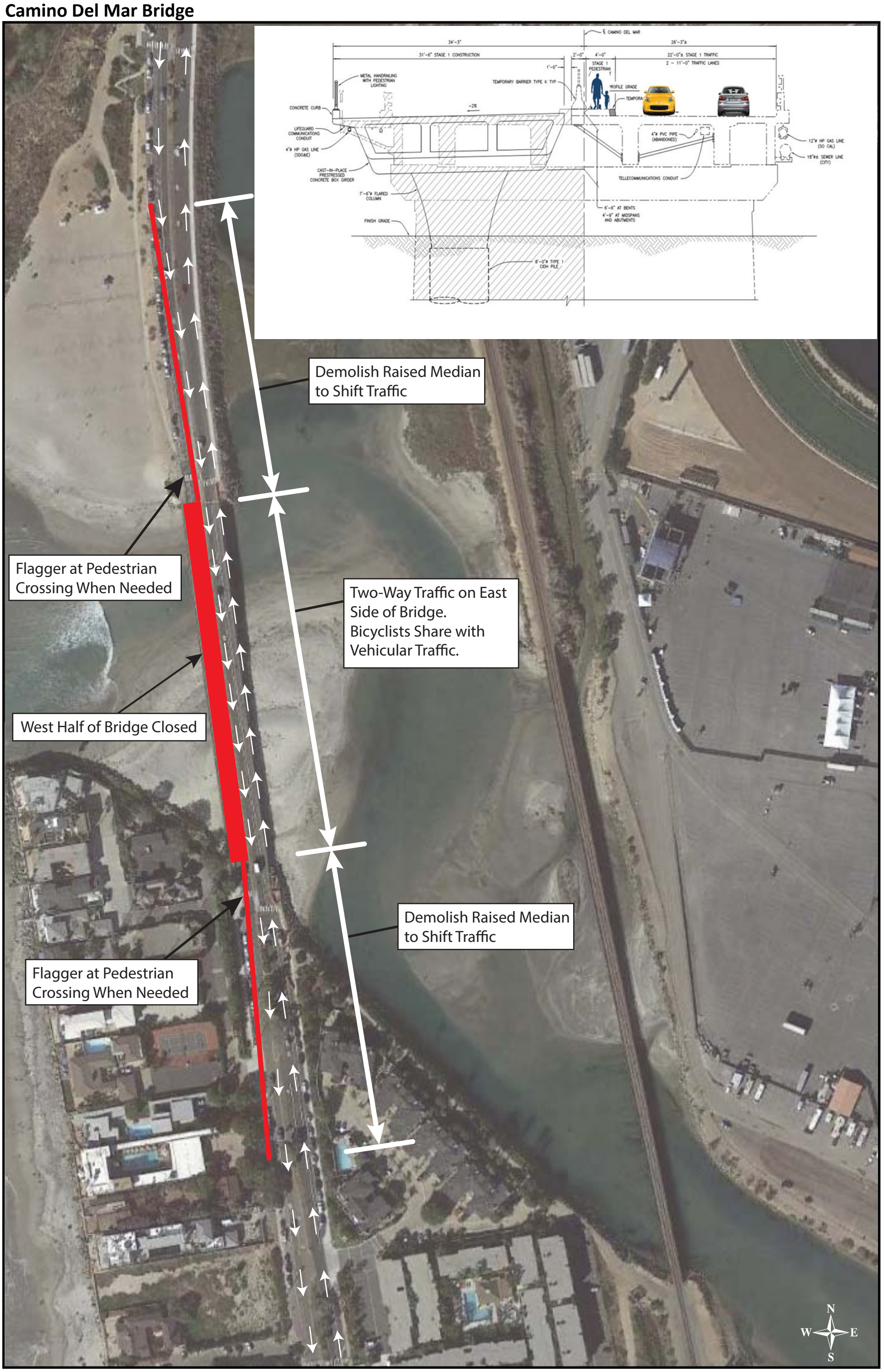
scenario. Based on the existing travel pattern along Camino Del Mar, a substantial amount of traffic is traveling along Highway 101 - Camino Del Mar between Lomas Santa Fe Drive and Del Mar Heights Road, as an alternate route to Interstate 5. To be conservative, for the analysis it was assumed that 20% of the southbound traffic during both AM and PM peak hour, and 30% of the northbound traffic during PM peak hour would be diverted to either Interstate 5 or Jimmy Durante Boulevard as a result of construction delay. **Figure 5-5** shows the diversion of traffic for the staged construction scenario. **Figure 5-6** shows the traffic volumes for the staged construction scenario.

- **Full Bridge Closure (Long-Term Closure) Construction Scenario:** For this construction scenario, as Camino Del Mar south of Via De La Valle would be fully closed, traffic will be detoured to Via De La Valle, Jimmy Durante Boulevard and Interstate 5. Since the intersection of Jimmy Durante Boulevard / Via De La Valle is currently operating at LOS D and Via De La Valle between Camino Del Mar and Jimmy Durante Boulevard is currently operating at LOS F, it is assumed that the majority of detoured traffic would be diverted onto Interstate 5 from interchanges outside of the study area. During the AM peak hour, it is assumed the 40% of traffic in both directions would be diverted onto Interstate 5. During the PM peak hour, it is assumed that 60% of the northbound traffic and 50% of the southbound traffic would be diverted onto Interstate 5. The remaining traffic, during both the peak hours, is assumed to divert either onto Via De La Valle and Jimmy Durante Boulevard or the Interstate 5 through Via De La Valle interchange. **Figure 5-7** shows the diversion of traffic for the full closure construction scenario. **Figure 5-8** shows the traffic volume at the study area during the full closure construction scenario.

5.2 Roadway Geometry

Apart from the bridge segment on Camino Del Mar, no changes to the intersection and roadway segment geometry were assumed for either of the construction scenarios.

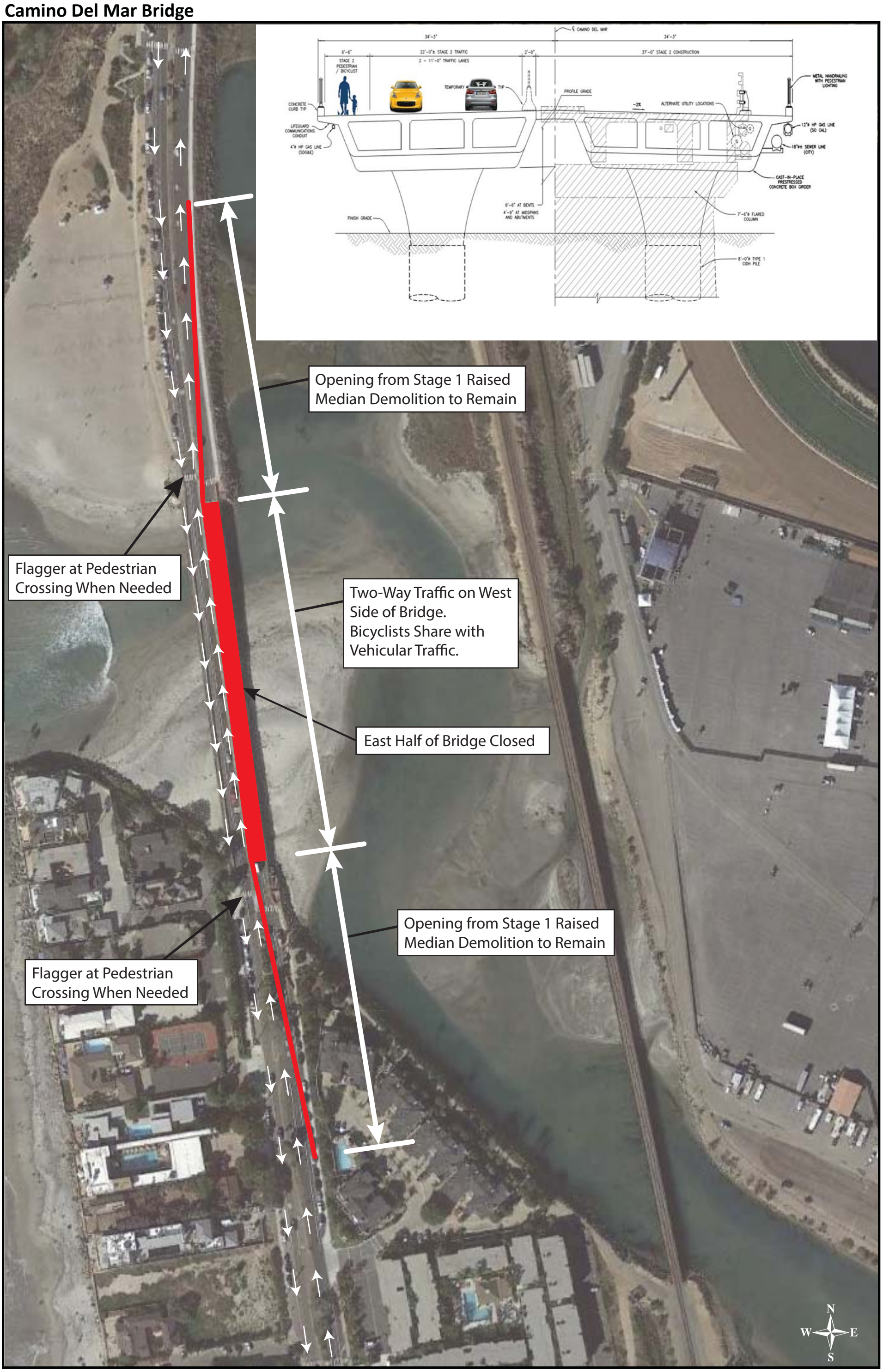
Camino Del Mar Bridge



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Figure 5-1
West Half Bridge Construction Stage Trafic Control Plan Concept

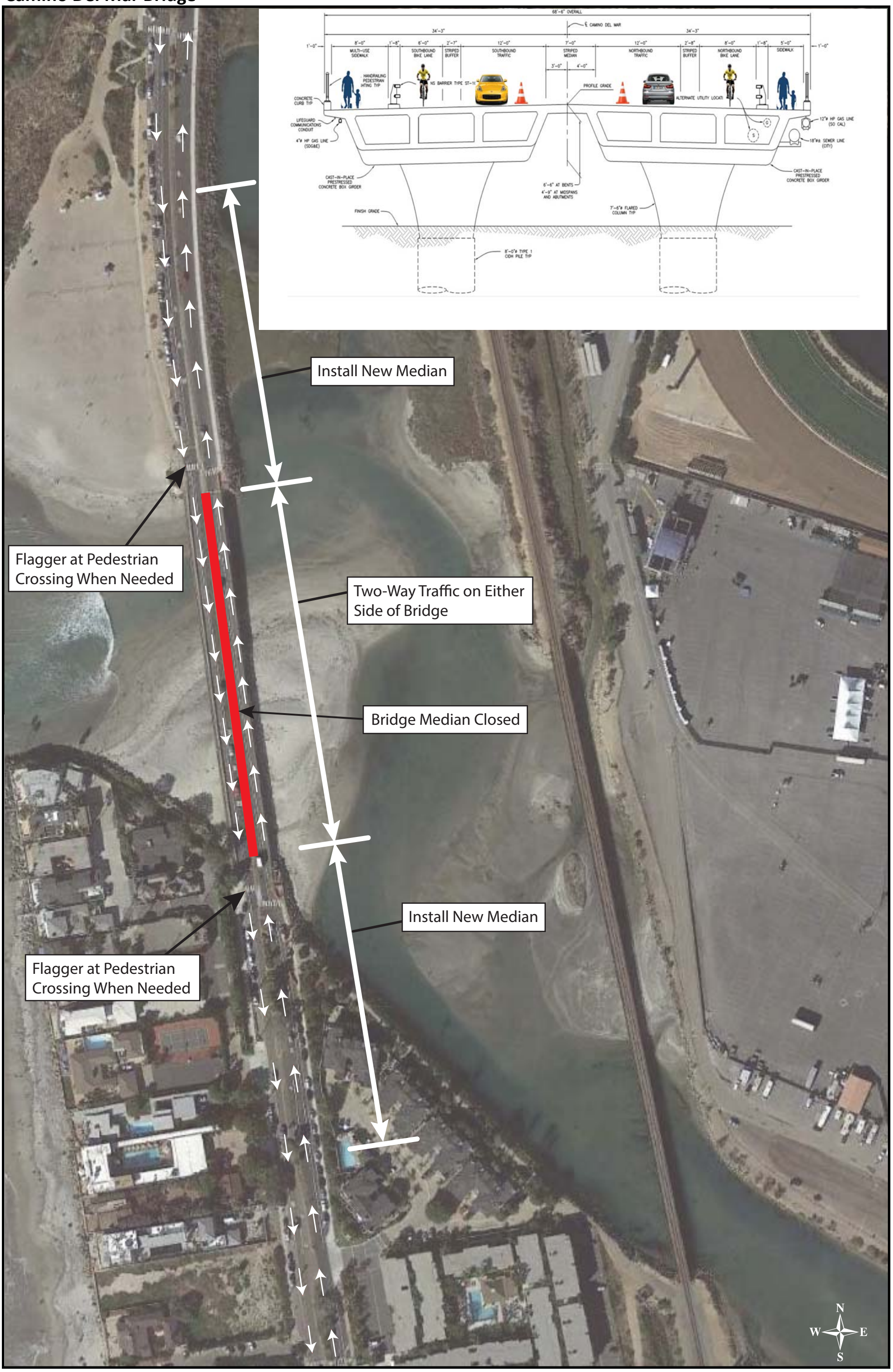
Camino Del Mar Bridge



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Figure 5-2
East Half Bridge Construction Stage Traffic Control Plan Concept

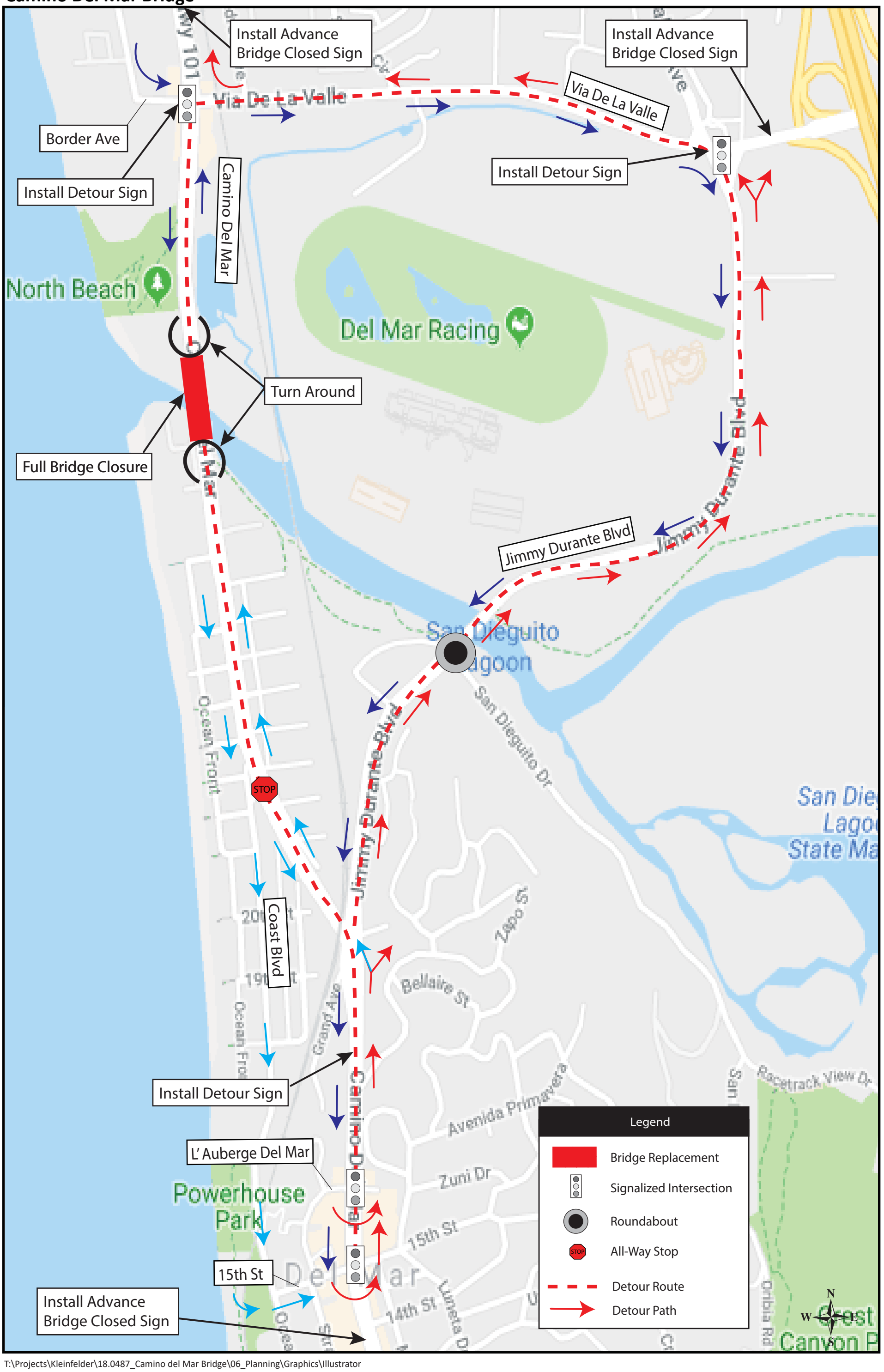
Camino Del Mar Bridge



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Figure 5-3
Bridge Median Construction Stage Traffic Control Plan Concept

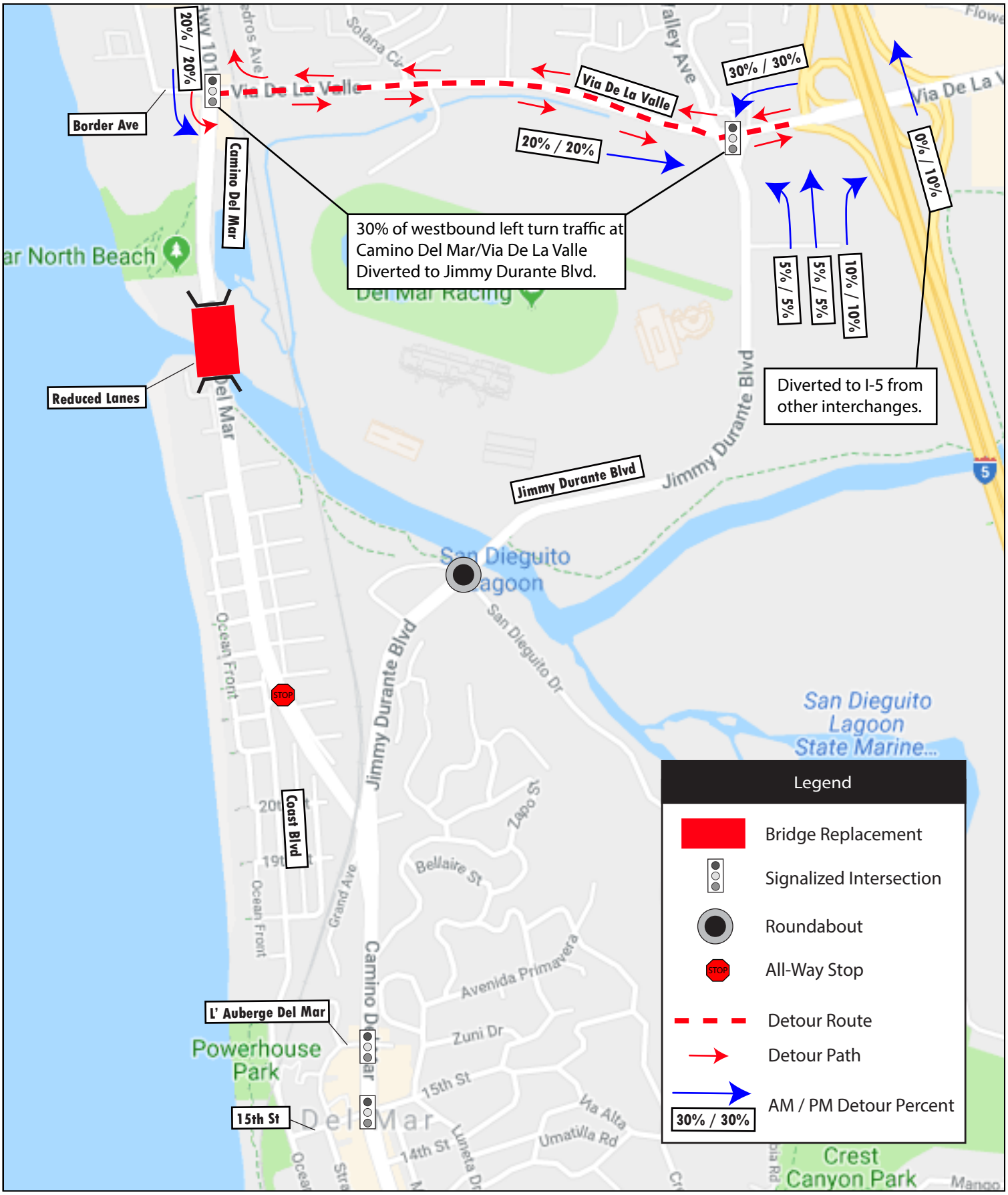
Camino Del Mar Bridge



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Figure 5-4
Full Bridge Closure Construction Scenario Detour Map Concept

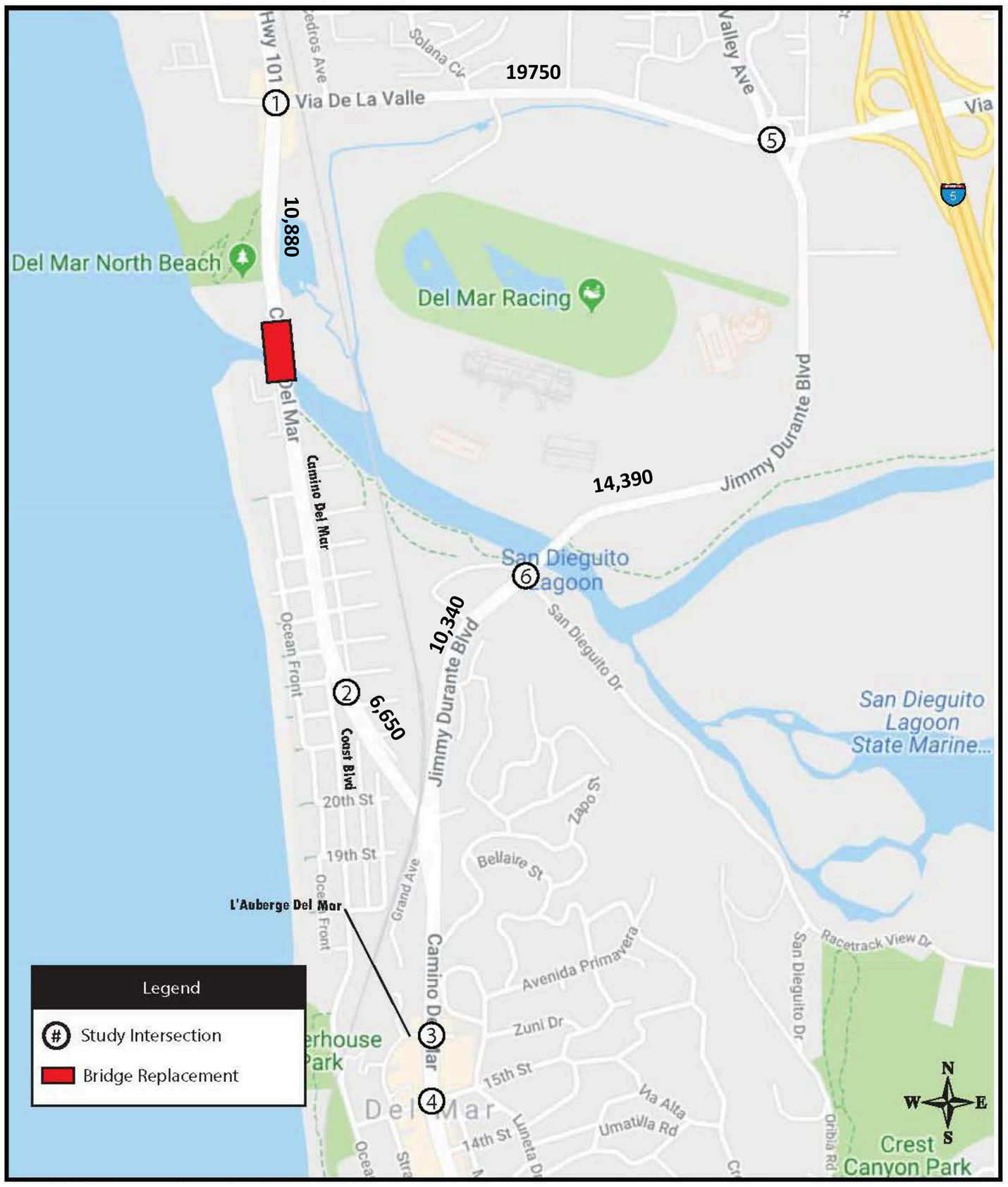
Camino Del Mar Bridge



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Figure 5-5
Potential Traffic DIversion for Staged Construction Scenario

Camino Del Mar Bridge



Highway 101 / Camino Del Mar @ Via De La Valle / Border Ave

13 / 11 ←	177 / 388 ↑	
313 / 222 ↓	99 / 92 ←	
483 / 295 →	66 / 78 ↓	
11 / 16 ↱		
2 / 5 ↑	4 / 6 ↰	7 / 34 ←
138 / 110 →		134 / 384 ↑
24 / 21 ↓		118 / 129 →

Camino Del Mar @ Court St / Coast Blvd

64 / 100 ←	7 / 2 ↑	
291 / 141 ↓	5 / 4 ←	
3 / 3 →		
7 / 4 ↱		
49 / 102 ↑	/ 4 ↰	9 / 11 ←
1 / 0 →		139 / 384 ↑
18 / 16 ↓		3 / 2 →

#REF!

16 / 21 ←	5 / 16 ↑	
570 / 495 ↓	1 / 17 ←	
13 / 19 →		
29 / 34 ↱		
18 / 22 ↑	/ 5 ↰	14 / 8 ←
1 / 0 →		382 / 1099 ↑
13 / 17 ↓		12 / 19 →

Camino Del Mar @ 15th St

39 / 64 ←	61 / 116 ↑	
473 / 395 ↓	9 / 22 ←	
86 / 80 →	32 / 40 ↓	
16 / 14 ↱		
36 / 54 ↑	/ 4 ↰	68 / 78 ←
8 / 10 →		283 / 940 ↑
67 / 84 ↓		61 / 40 →

Valley Ave / Jimmy Durante Blvd @ Via De La Valle

69 / 66 ←	339 / 379 ↑	
122 / 136 ↓	564 / 638 ←	
526 / 358 →	410 / 706 ↓	
53 / 39 ↑	24 / 116 ←	
787 / 560 →	79 / 202 ↑	
71 / 95 ↓	239 / 685 →	

Jimmy Durante Blvd @ San Dieguito Dr

6 / 3 ←	33 / 44 ↑	
447 / 334 ↓	2 / 1 ←	
32 / 45 →	12 / 6 ↓	
5 / 13 ↑	4 / 3 ←	
2 / 0 →	246 / 769 ↑	
4 / 1 ↓	9 / 20 →	

LEGEND

xx / yy = AM / PM Peak-Hour Turning Movement Volumes

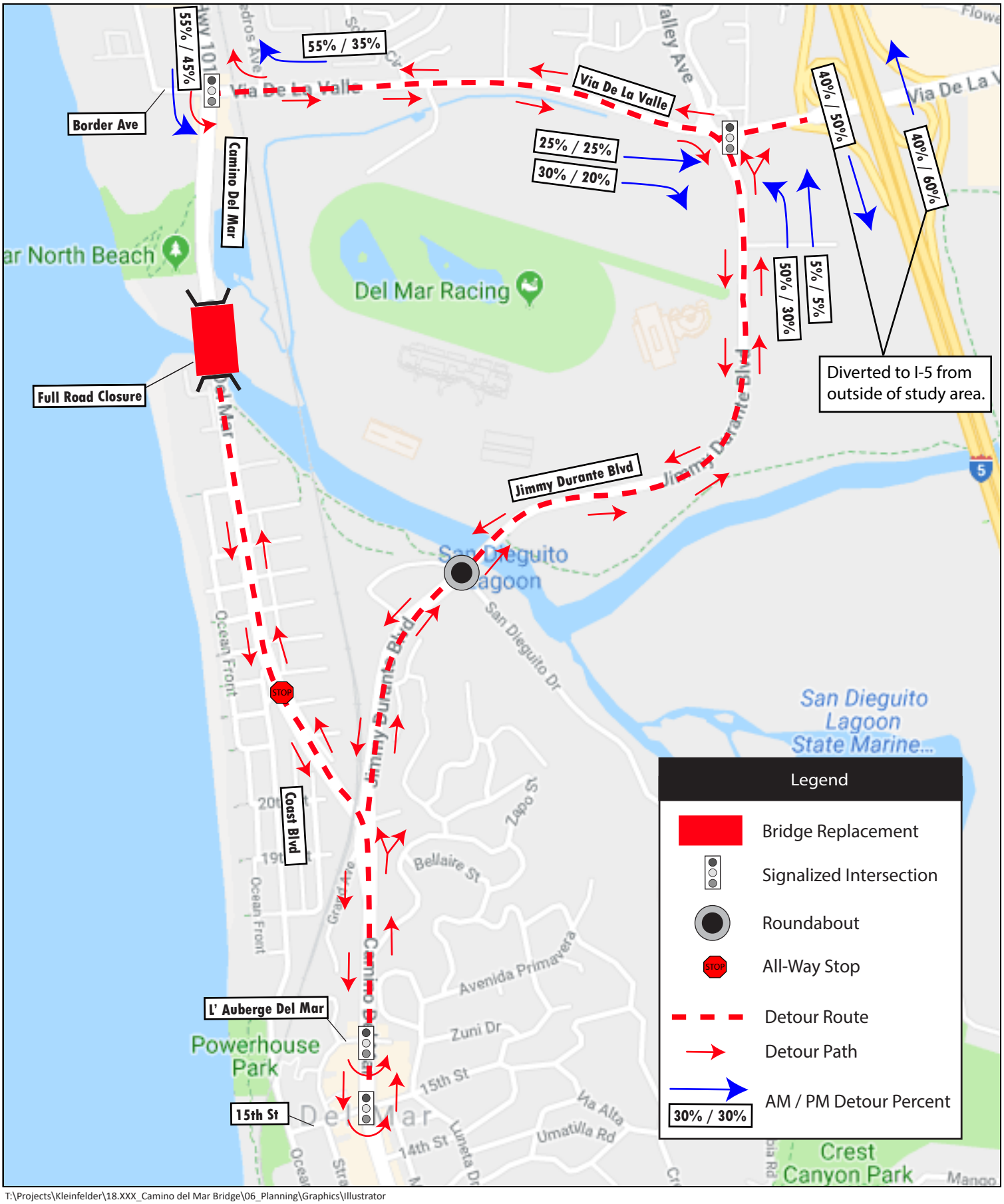
X,XXX = ADT Volume

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Figure 5-6

Staged Construction Scenario Traffic Volumes

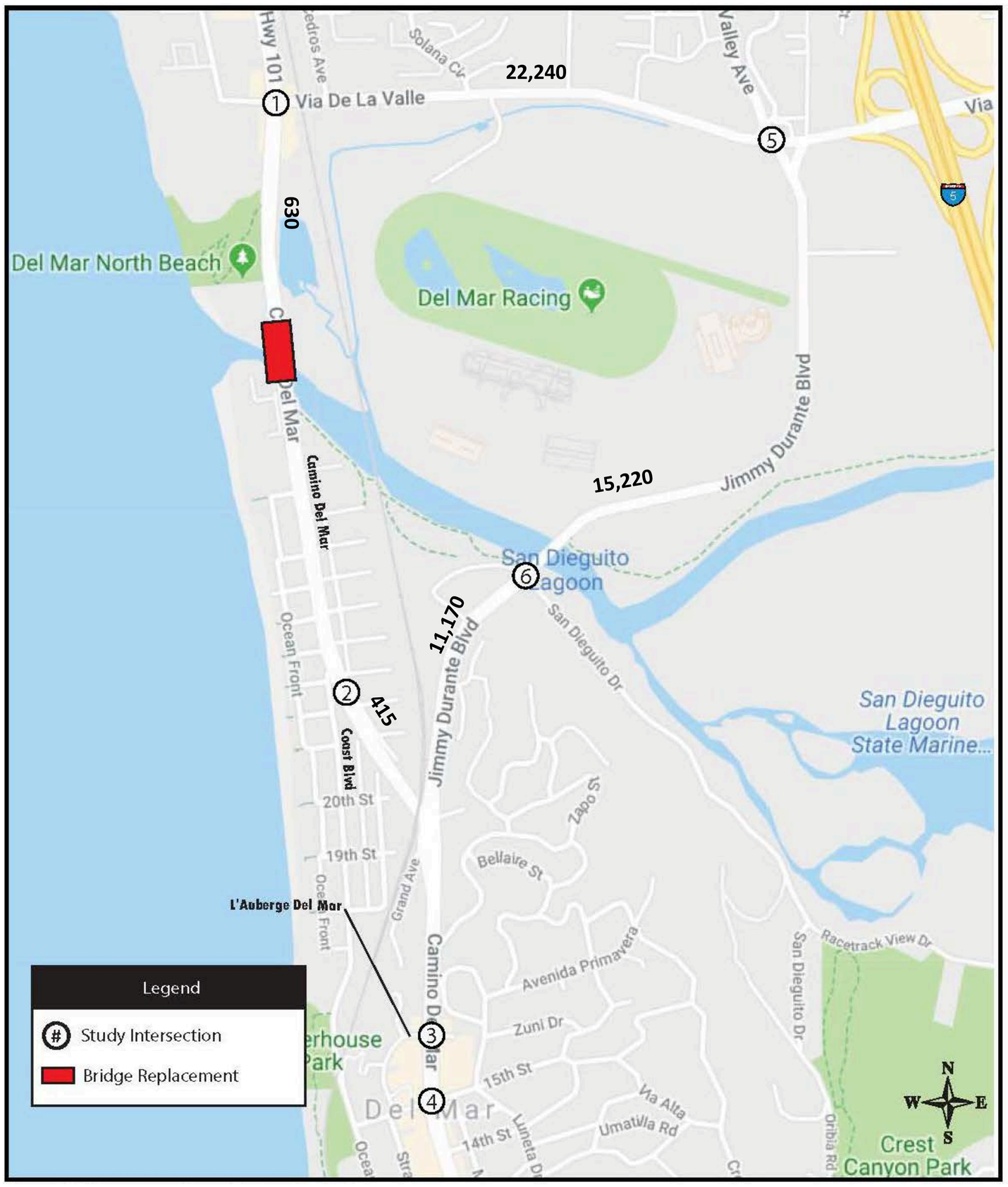
Camino Del Mar Bridge



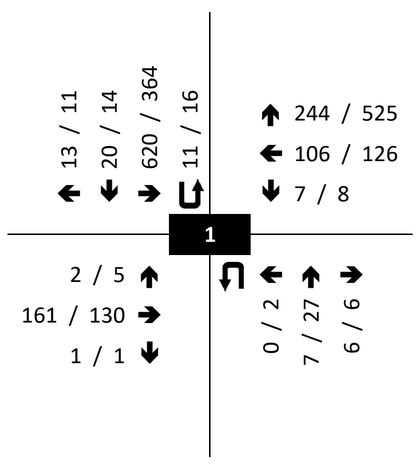
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Figure 5-7
Potential Traffic DIversion for Full Closure Construction Scenario

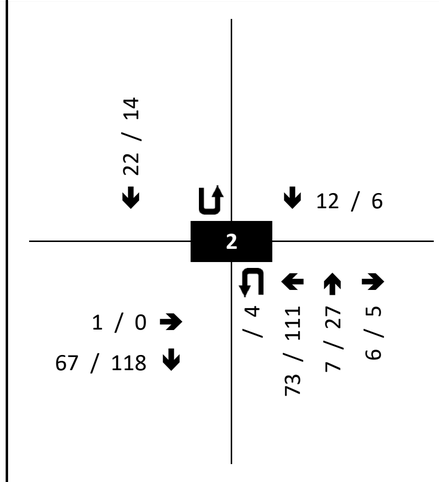
Camino Del Mar Bridge



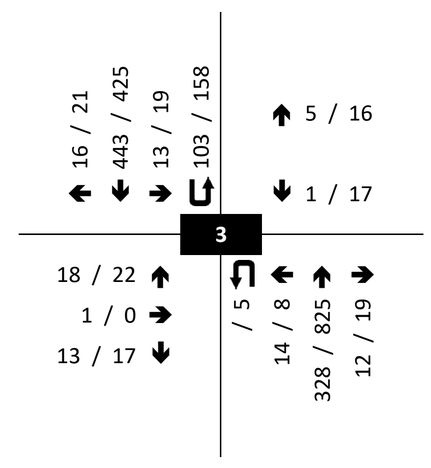
Highway 101 / Camino Del Mar @ Via De La Valle / Border Ave



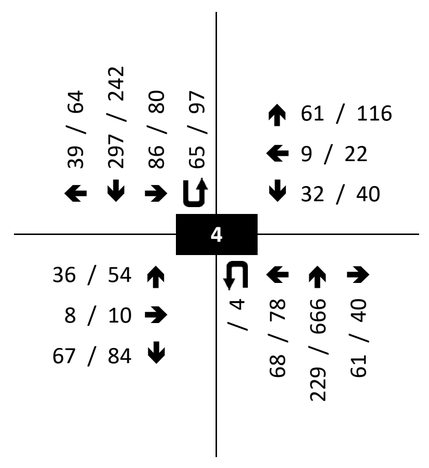
Camino Del Mar @ Court St / Coast Blvd



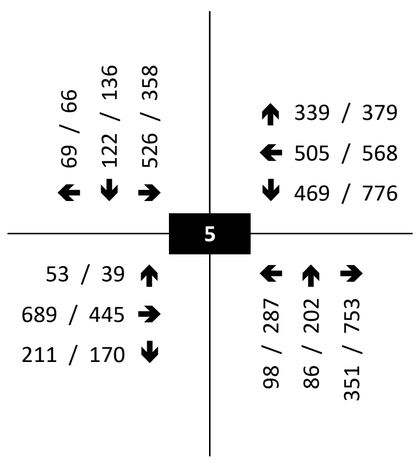
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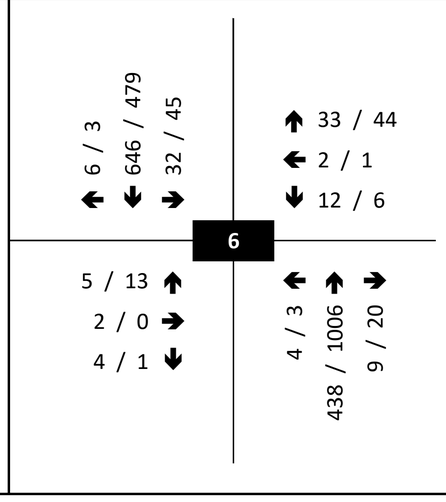
Camino Del Mar @ 15th St



Valley Ave / Jimmy Durante Blvd @ Via De La Valle



Jimmy Durante Blvd @ San Dieguito Dr



LEGEND

xx / yy = AM / PM Peak-Hour Turning Movement Volumes

X,XXX = ADT Volume

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Figure 5-8

Full Closure Construction Scenario Traffic Volumes

5.3 Intersection Analysis

Levels of service (LOS) were determined at the study area intersections for the AM and PM peak hours for the two construction conditions scenarios. **Table 5-1** presents the operational analysis for the staged construction (No Closure) scenario and **Table 5-2** presents the operational analysis for the full closure construction scenario. Level of service analysis worksheets for the Staged Construction (No Closure) Scenario are provided in **Appendix E.** Level of service analysis worksheets for the Full Closure Construction Scenario are provided in **Appendix F.**

TABLE 5-1: STAGED CONSTRUCTION (NO CLOSURE) SCENARIO PEAK HOUR LOS SUMMARY

Intersection		Traffic Control	Peak Hour	Existing Conditions		Staged Construction (No Closure) Scenario		Significant Impact?	
				Delay[a] (sec)	LOS	Delay[a] (sec)	LOS	Δ Delay (sec)	Impact?
1	Hwy 101 & Camino Del Mar / Via De La Valle	Signal [b]	AM	20.5	C	23.3	C	2.8	No
			PM	22.6	C	20.6	C	-2.0	No
2	Camino Del Mar / Coast Blvd	AWSC [c]	AM	13.7	B	10.3	B	-3.4	No
			PM	35.8	**E**	13.8	B	-22.0	No
3	Camino Del Mar & L'Auberge Del Mar / Plaza Parking	Signal [b]	AM	6.5	A	6.3	A	-0.2	No
			PM	11.5	B	11.2	B	-0.3	No
4	Camino Del Mar / 15th St	Signal [b]	AM	16.7	B	16.7	B	0.0	No
			PM	24.4	C	24.6	C	0.2	No
5	Jimmy Durante Blvd / Via De La Valle	Signal [b]	AM	38.4	D	40.7	D	2.3	No
			PM	46.4	D	49.0	D	2.6	No
6	Jimmy Durante Blvd / San Dieguito Dr	Roundabout [c]	AM	6.9	A	7.5	A	0.6	No
			PM	11.0	B	14.4	B	3.4	No

Notes:

Signal: Traffic signal, AWSC: all-way stop control

(a) Delays are reported as the average control Delay for the entire intersection at signalized intersections and average Delay for all-way stop controlled and roundabout intersections.

(b) Delay and LOS calculations are based on the methodology outlined in the 2000 Highway Capacity Manual (HCM).

(c) Delay and LOS calculations are based on the methodology outlined in the 2010 Highway Capacity Manual (HCM).

As shown in Table 5-1, all the study intersections continue to operate at LOS D or better for both the AM and PM peak hour for the staged construction (No Closure) scenario. The staged construction (No Closure) scenario would not cause any significant impact at the study intersections

TABLE 5-2: FULL CLOSURE CONSTRUCTION SCENARIO PEAK HOUR LOS SUMMARY

Intersection		Traffic Control	Peak Hour	Existing Conditions		Full Closure Construction Scenario		Significant Impact?	
				Delay[a] (sec)	LOS	Delay[a] (sec)	LOS	Δ Delay (sec)	Impact?
1	Hwy 101 & Camino Del Mar / Via De La Valle	Signal [b]	AM	20.5	C	18.3	B	-2.2	No
			PM	22.6	C	16.1	B	-6.5	No
2	Camino Del Mar / Coast Blvd	AWSC [c]	AM	13.7	B	8.0	A	-5.7	No
			PM	35.8	**E**	8.4	A	-27.4	No
3	Camino Del Mar & L'Auberge Del Mar / Plaza Parking	Signal [b]	AM	6.5	A	7.4	A	0.9	No
			PM	11.5	B	16.3	B	4.8	No
4	Camino Del Mar / 15th St	Signal [b]	AM	16.7	B	17.4	B	0.7	No
			PM	24.4	C	29.0	C	4.6	No
5	Jimmy Durante Blvd / Via De La Valle	Signal [b]	AM	38.4	D	44.5	D	6.1	No
			PM	46.4	D	54.8	D	8.4	No
6	Jimmy Durante Blvd / San Dieguito Dr	Roundabout [c]	AM	6.9	A	11.2	B	4.3	No
			PM	11.0	B	36.4	**E**	25.4	**Yes**

Notes:

Signal: Traffic signal, AWSC: all-way stop control

(a) Delays are reported as the average control Delay for the entire intersection at signalized intersections and average Delay for all-way stop controlled and roundabout intersections.

(b) Delay and LOS calculations are based on the methodology outlined in the 2000 Highway Capacity Manual (HCM).

(c) Delay and LOS calculations are based on the methodology outlined in the 2010 Highway Capacity Manual (HCM).

As shown in Table 5-2, all the study intersections continue to operate at LOS D or better for both the AM and PM peak hour for the full closure construction scenario, except for the intersection at Jimmy Durante Boulevard / San Dieguito Drive, which operate at an unacceptable LOS E during the PM peak hour. The full closure construction scenario causing a significant impact at the intersection of Jimmy Durante Boulevard / San Dieguito Drive.

5.4 Roadway Segment Analysis

Table 5-3 summarizes the daily operations of the study area roadway segments for the staged construction (No Closure) scenario and, **Table 5-4** summarizes the daily operations of the study area roadway segments for the full closure construction scenario.

TABLE 5-3: STAGED CONSTRUCTION (NO CLOSURE) SCENARIO DAILY ROADWAY SEGMENT LOS SUMMARY

Segment	Functional Classification/ Lanes	Daily Capacity	Existing Conditions			Staged Construction (No Closure) Scenario			Change in V/C	Significant
			ADT	V/C Ratio	LOS	ADT	V/C Ratio	LOS		
Camino Del Mar										
Via De La Valle to Coast Blvd.	2-Lane Collector	15,000	12,540	0.836	D	10,878	0.725	D	-0.111	No
Coast Blvd to Jimmy Durante Blvd.	2-Lane Collector	15,000	8,312	0.554	C	6,650	0.443	B	-0.111	No
Jimmy Durante Boulevard										
Via De La Valle to South Fair Access	4-Lane Collector	30,000	13,141	0.438	B	14,388	0.480	C	0.042	No
South Fair Access to Camino Del Mar	2-Lane Collector	15,000	9,092	0.606	C	10,339	0.689	D	0.083	No
Via De La Valle										
Hwy 101-Camino Del Mar to Jimmy Durante Blvd.	2-Lane Collector	15,000	18,498	1.233	**F**	19,745	1.316	**F**	0.083	**Yes**

V/C = Volume to Capacity Ratio

As shown in Table 5-3, all the study roadway segments continue to operate at acceptable LOS D or better for the staged construction (No Closure) scenario except for Via De La Valle, which continue to operate at an unacceptable LOS F. The staged construction (No Closure) scenario causes a significant impact at Via De La Valle roadway segment.

TABLE 5-4: FULL CLOSURE CONSTRUCTION SCENARIO DAILY ROADWAY SEGMENT LOS SUMMARY

Segment	Functional Classification/ Lanes	Daily Capacity	Existing Conditions			Full Closure Construction Scenario			Change in V/C	Significant
			ADT	V/C Ratio	LOS	ADT	V/C Ratio	LOS		
Camino Del Mar										
Via De La Valle to Coast Blvd.	2-Lane Collector	15,000	12,540	0.836	D	627	0.042	A	-0.794	No
Coast Blvd to Jimmy Durante Blvd.	2-Lane Collector	15,000	8,312	0.554	C	416	0.028	A	-0.526	No
Jimmy Durante Boulevard										
Via De La Valle to South Fair Access	4-Lane Collector	30,000	13,141	0.438	B	15,219	0.507	C	0.069	No
South Fair Access to Camino Del Mar	2-Lane Collector	15,000	9,092	0.606	C	11,170	0.745	D	0.139	No
Via De La Valle										
Hwy 101-Camino Del Mar to Jimmy Durante Blvd.	2-Lane Collector	15,000	18,498	1.233	**F**	22,238	1.483	**F**	0.249	**Yes**

V/C = Volume to Capacity Ratio

As shown in Table 5-4, all the study roadway segments continue to operate at acceptable LOS D or better for the full closure construction scenario except for Via De La Valle, which continue to operate at an unacceptable LOS F. The full closure construction scenario causes a significant impact at Via De La Valle roadway segment.

6 ACCIDENT DATA ASSESSMENT

An assessment of accident data was conducted for Camino Del Mar in the vicinity of the bridge site. Three years historical data was obtained from the Transportation Injury Mapping System (TIMS) data base maintained by University of California, Berkley, California. Figure 6-1 below, obtained from TIMS, shows the accident locations occurred between January 2015 and December 2017. As shown in the map below, there were no accidents that occurred in the vicinity of the bridge site.

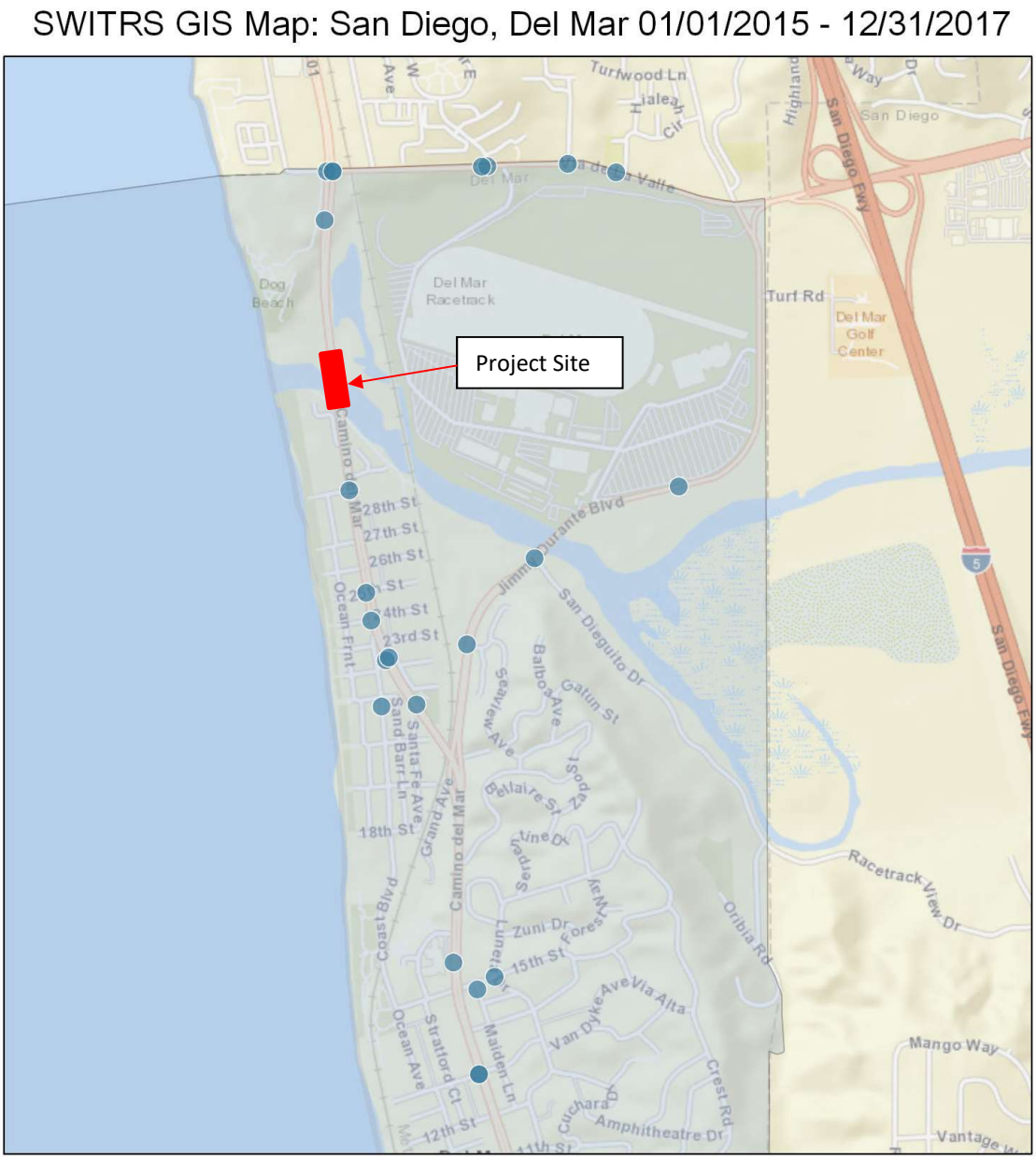


Figure 6-1 Accident Locations

7 SIGNIFICANT IMPACTS AND MITIGATION MEASURES

From the above analysis following summarizes the impacts due to respective construction scenarios:

Staged Construction (No Closure) Scenario

This construction scenario is forecast to result in a significant impact at the following study area roadway segment:

- Via De La Valle between Hwy 101-Camino Del Mar and Jimmy Durante Boulevard – LOS F

Full Closure Construction Scenario

This construction scenario is forecast to result in a significant impact at the following study area intersection and roadway segment:

6. Jimmy Durante Boulevard / San Dieguito Drive – LOS E (PM peak hour)

- Via De La Valle between Hwy 101-Camino Del Mar and Jimmy Durante Boulevard – LOS F

The impacts due to construction on the study intersection and roadway segment are a temporary condition. The significant impact at the intersection of Jimmy Durante Boulevard / San Dieguito Drive due to the construction occurs only during the PM peak hour. Since this intersection is a roundabout with one lane entry/exit approaches and is physically constrained, no feasible mitigation measures are recommended.

For the staged construction scenario, it can be assumed that traffic diversion would occur only during the peak hour when traffic and delay are high along Camino Del Mar and the time to pass through the construction zone exceeds the time and delay that may occur if an alternate route was chosen. It is assumed that no traffic will be diverted during the off peak, when the traffic and delay are low, and the construction will have limited impacts on travel time. Via De La Valle currently operate at unacceptable LOS, and the change in v/c due to traffic diversion is minor. Although the segment analysis shows a significant impact on Via De La Valle, the worst-case condition generally occurs during the peak hour of the day as against occurring throughout the day. Via De La Valle is currently designed to accommodate bike lanes and parking on either side of the roadway and, a center two-way-left-turn-lane. Any changes to mitigate the impacts would change the characteristics of the current roadway conditions. For this reason, no mitigation is recommended.

8 PEDESTRIAN, BICYCLE AND TRANSIT IMPACTS

This section summarizes the impacts of the two construction scenarios on pedestrian, bicycle and transit facilities.

Staged Construction (No Closure) Scenario

During first two stages of this construction scenario, the segment of Camino Del Mar under construction, will have travel lanes with reduced lane widths and no bike lanes. Bicyclists will share the road with the vehicular traffic. Sidewalks will be provided on one side of the roadway for the first two construction stages. Stage three of this construction scenario will consist of buffered bike lanes and sidewalk on both sides of the roadway segment. Stop signs will be proposed to be installed at pedestrian crossings, on either side of the bridge construction, to facilitate safe pedestrian crossing. The bus route currently traveling along Camino Del Mar can continue to travel along this roadway segment during all stages of this construction scenario.

Full Closure Construction Scenario

This construction scenario will fully close the Camino Del Mar bridge throughout the construction period, and all modes of traffic will be detoured to Via De La Valle and Jimmy Durante Boulevard. Access to the beach, west of Camino Del Mar and south of Via De La Valle will be open for public during construction. The bus stops along Camino Del Mar between south of the bridge and Jimmy Durante Boulevard will not be served during this construction scenario. Bus riders currently commuting from these bus stops will have to access the bus stops at Camino Del Mar / 15th Street intersection, which is 0.9 mile from the 29th Street bus stop and 0.67 mile from the 24th Street bus stops.

9 FINDINGS AND CONCLUSIONS

The Camino Del Mar bridge over the San Dieguito River is located within the City of Del Mar, west of Interstate 5, south of Via De La Valle. The bridge is proposed to be replaced to include one travel lane and one buffered bike lane in either direction. The new bridge is also proposed to include a protected sidewalk on each side of the bridge and a center striped median. This transportation impact analysis evaluated the existing conditions and the Horizon Year 2040 traffic conditions with the new bridge.

Sidewalks are provided on either both sides or just one side of the street along Camino Del Mar and Jimmy Durante Boulevard. Along Via De La Valle, sidewalk are provided on both sides between Highway 101 – Camino Del Mar and Jimmy Durante Boulevard. Class II bicycle lanes are provided in both directions along Camino Del Mar, Jimmy Durante Boulevard and Via De La Valle. Buffered bike lanes are provided at some locations along Camino Del Mar.

The results of the existing conditions analysis showed that all the study intersections and roadway segments operate at acceptable LOS D or better except for the following:

2. Camino Del Mar / Coast Boulevard – LOS E (PM peak hour)

- Via De La Valla between Hwy 101-Camino Del Mar and Jimmy Durante Blvd. – LOS F

The results of the Horizon Year 2040 analysis showed that all the study intersections and roadway segments operate at acceptable LOS D or better except for the following:

3. Camino Del Mar / Coast Boulevard – LOS F (PM peak hour)
6. Jimmy Durante Blvd / San Dieguito Dr – LOS E (PM peak hour)

- Camino Del Mar between Via De La Valle and Coast Blvd. – LOS E
- Via De La Valle between Hwy 101-Camino Del Mar and Jimmy Durante Blvd. – LOS F

Although these segments and intersections operate at deficient LOS with the new bridge, the project does not result in a significant impact as these locations would operate at a deficient LOS without or with the proposed project. Along Camino Del Mar, it may be feasible to restripe the bridge in the future to provide two northbound lanes and one southbound lane, resulting in a capacity of approximately 20,000 vehicles per day at LOS D. This restripe would mitigate forecast LOS E conditions on the bridge.

This study also evaluated the traffic conditions of the study area during the construction. Two construction scenarios were considered in this transportation analysis: staged construction with reduced travel lanes and full closure. For the staged construction scenario, the bridge will remain accessible throughout the demolition and replacement period, with two-way traffic maintained at all times. For the full closure construction scenario, traffic will be detoured to Via De La Valle, Jimmy Durante Boulevard and Interstate 5.

The results of the staged construction (No Closure) scenario analysis showed that all the study intersections and roadway segments operate at acceptable LOS D or better except for the following roadway segment:

- Via De La Valle between Hwy 101-Camino Del Mar and Jimmy Durante Blvd. – LOS F

The results of the full closure construction scenario analysis showed that all the study intersections and roadway segments operate at acceptable LOS D or better except for the following:

6. Jimmy Durante Boulevard / San Dieguito Drive – LOS E (PM peak hour)

- Via De La Valle between Hwy 101-Camino Del Mar and Jimmy Durante Blvd. – LOS F

Although the two construction scenarios result in significant impacts due to traffic diversion, the impacts are temporary and generally occur during the peak hours. Since the intersection of Jimmy Durante Boulevard / San Dieguito Drive is a roundabout and is physically constrained, no feasible mitigation measure can be implemented. The segment of Via De La Valle between Hwy 101-Camino Del Mar and Jimmy Durante Boulevard currently operate at unacceptable LOS, and the change in v/c due to traffic diversion is minor. To retain the characteristics of the current roadway conditions, no mitigation measures are recommended. To minimize impacts to these locations, traffic control signage in advance of the study area should be installed to deter drivers from entering the study area or surrounding community.

Based on the accident data assessment, no accidents occurred in the vicinity of the bridge site between January 2015 and December 2017. With the proposed geometry design of the bridge providing improvements, it can be concluded that there would not be any critical issues in the geometry.

Appendix A

Existing Traffic Volumes

Prepared by National Data & Surveying Services

CLASSIFICATION

Camino Del Mar Bet. Via De La Valle & Coast Blvd

Day: Wednesday
Date: 4/25/2018

City: Del Mar
Project #: CA18_4144_001

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	16	0	0	0	0	0	0	0	0	0	0	0	16
01:00	0	13	0	0	0	0	0	0	0	0	0	0	0	13
02:00	0	16	0	0	0	0	0	0	0	0	0	0	0	16
03:00	0	5	0	0	0	0	0	1	0	0	0	0	0	6
04:00	0	19	3	0	0	0	0	0	0	0	0	0	0	22
05:00	1	53	3	0	4	0	0	0	0	0	0	0	0	61
06:00	0	275	33	2	7	1	0	0	0	0	0	0	0	318
07:00	3	597	68	3	10	2	0	0	4	0	0	0	0	687
08:00	2	724	58	2	16	4	0	0	2	0	0	0	0	808
09:00	1	628	64	2	13	3	0	2	2	0	0	0	0	715
10:00	0	663	46	3	10	5	1	0	2	0	0	0	0	730
11:00	10	770	49	3	11	1	0	2	3	0	0	0	0	849
12:00 PM	5	879	61	2	13	2	0	0	0	0	0	0	0	962
13:00	4	892	40	2	11	2	0	0	3	0	0	0	0	954
14:00	8	836	45	2	3	1	0	0	0	0	0	0	0	895
15:00	7	1039	43	3	7	1	1	1	0	0	0	0	0	1102
16:00	3	1099	45	2	10	0	0	0	0	0	0	0	0	1159
17:00	4	1058	39	2	7	0	2	0	0	0	0	0	0	1112
18:00	4	769	33	3	3	0	0	1	0	0	0	0	0	813
19:00	3	565	20	2	2	0	0	0	0	0	0	0	0	592
20:00	0	306	12	2	2	0	0	0	0	0	0	0	0	322
21:00	1	201	5	1	1	0	0	0	0	0	0	0	0	209
22:00	0	115	0	0	0	0	0	0	0	0	0	0	0	115
23:00	0	63	1	0	0	0	0	0	0	0	0	0	0	64
Totals	56	11601	668	36	130	22	4	7	16					12540
% of Totals	0%	93%	5%	0%	1%	0%	0%	0%	0%					100%

AM Volumes	17	3779	324	15	71	16	1	5	13	0	0	0	0	4241
% AM	0%	30%	3%	0%	1%	0%	0%	0%	0%					34%
AM Peak Hour	11:00	11:00	07:00	07:00	08:00	10:00	10:00	09:00	07:00					11:00
Volume	10	770	68	3	16	5	1	2	4					849
PM Volumes	39	7822	344	21	59	6	3	2	3	0	0	0	0	8299
% PM	0%	62%	3%	0%	0%	0%	0%	0%	0%					66%
PM Peak Hour	14:00	16:00	12:00	15:00	12:00	12:00	17:00	15:00	13:00					16:00
Volume	8	1099	61	3	13	2	2	1	3					1159

Directional Peak Periods All Classes	AM 7-9 Volume		%	NOON 12-2 Volume		%	PM 4-6 Volume		%	Off Peak Volumes Volume		%
	1495	⟷	12%	1916	⟷	15%	2271	⟷	18%	6858	⟷	55%

Classification Definitions

1 Motorcycles	**4** Buses	**7** > =4-Axle Single Units	**10** >=6-Axle Single Trailers	**13** >=7-Axle Multi-Trailers
2 Passenger Cars	**5** 2-Axle, 6-Tire Single Units	**8** <=4-Axle Single Trailers	**11** <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	**6** 3-Axle Single Units	**9** 5-Axle Single Trailers	**12** 6-Axle Multi-Trailers	

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Camino Del Mar Bet. Via De La Valle & Coast Blvd

Day: Wednesday
Date: 4/25/2018

City: Del Mar
Project #: CA18_4144_001

DAILY TOTALS	NB	SB	EB	WB	Total
	6,328	6,212	0	0	12,540

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	2		1		0	0	3		12:00	122		133		0	0	255	
00:15	2		3		0	0	5		12:15	114		102		0	0	216	
00:30	4		0		0	0	4		12:30	110		130		0	0	240	
00:45	1	9	3	7	0	0	4	16	12:45	127	473	124	489	0	0	251	962
01:00	1		1		0	0	2		13:00	124		121		0	0	245	
01:15	0		1		0	0	1		13:15	107		101		0	0	208	
01:30	2		3		0	0	5		13:30	130		128		0	0	258	
01:45	4	7	1	6	0	0	5	13	13:45	128	489	115	465	0	0	243	954
02:00	7		3		0	0	10		14:00	107		101		0	0	208	
02:15	1		1		0	0	2		14:15	122		114		0	0	236	
02:30	2		2		0	0	4		14:30	119		77		0	0	196	
02:45	0	10	0	6	0	0		16	14:45	140	488	115	407	0	0	255	895
03:00	1		1		0	0	2		15:00	169		114		0	0	283	
03:15	1		1		0	0	2		15:15	142		106		0	0	248	
03:30	0		0		0	0			15:30	170		113		0	0	283	
03:45	1	3	1	3	0	0	2	6	15:45	173	654	115	448	0	0	288	1102
04:00	2		1		0	0	3		16:00	179		117		0	0	296	
04:15	3		0		0	0	3		16:15	188		114		0	0	302	
04:30	3		6		0	0	9		16:30	178		100		0	0	278	
04:45	5	13	2	9	0	0	7	22	16:45	172	717	111	442	0	0	283	1159
05:00	5		1		0	0	6		17:00	167		103		0	0	270	
05:15	3		8		0	0	11		17:15	167		117		0	0	284	
05:30	5		7		0	0	12		17:30	192		131		0	0	323	
05:45	16	29	16	32	0	0	32	61	17:45	136	662	99	450	0	0	235	1112
06:00	12		34		0	0	46		18:00	138		107		0	0	245	
06:15	15		45		0	0	60		18:15	115		89		0	0	204	
06:30	28		54		0	0	82		18:30	114		100		0	0	214	
06:45	36	91	94	227	0	0	130	318	18:45	78	445	72	368	0	0	150	813
07:00	45		121		0	0	166		19:00	94		77		0	0	171	
07:15	44		108		0	0	152		19:15	84		76		0	0	160	
07:30	51		119		0	0	170		19:30	73		75		0	0	148	
07:45	52	192	147	495	0	0	199	687	19:45	56	307	57	285	0	0	113	592
08:00	73		118		0	0	191		20:00	56		47		0	0	103	
08:15	66		141		0	0	207		20:15	40		43		0	0	83	
08:30	79		151		0	0	230		20:30	32		46		0	0	78	
08:45	69	287	111	521	0	0	180	808	20:45	28	156	30	166	0	0	58	322
09:00	74		116		0	0	190		21:00	30		34		0	0	64	
09:15	85		98		0	0	183		21:15	28		35		0	0	63	
09:30	60		86		0	0	146		21:30	15		29		0	0	44	
09:45	93	312	103	403	0	0	196	715	21:45	17	90	21	119	0	0	38	209
10:00	83		86		0	0	169		22:00	16		16		0	0	32	
10:15	82		83		0	0	165		22:15	22		9		0	0	31	
10:30	83		109		0	0	192		22:30	26		8		0	0	34	
10:45	108	356	96	374	0	0	204	730	22:45	10	74	8	41	0	0	18	115
11:00	108		101		0	0	209		23:00	9		11		0	0	20	
11:15	118		102		0	0	220		23:15	14		7		0	0	21	
11:30	94		96		0	0	190		23:30	9		4		0	0	13	
11:45	108	428	122	421	0	0	230	849	23:45	4	36	6	28	0	0	10	64
TOTALS		1737		2504				4241	TOTALS		4591		3708				8299
SPLIT %		41.0%		59.0%				33.8%	SPLIT %		55.3%		44.7%				66.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	6,328	6,212	0	0	12,540

AM Peak Hour	11:45		07:45					11:45	PM Peak Hour	15:45		12:00					15:30
AM Pk Volume	454		557					941	PM Pk Volume	718		489					1169
Pk Hr Factor	0.930		0.922					0.923	Pk Hr Factor	0.955		0.919					0.968
7 - 9 Volume	479		1016		0		0	1495	4 - 6 Volume	1379		892		0		0	2271
7 - 9 Peak Hour	08:00		07:45					07:45	4 - 6 Peak Hour	16:00		16:45					16:45
7 - 9 Pk Volume	287		557		0		0	827	4 - 6 Pk Volume	717		462		0		0	1160
Pk Hr Factor	0.908		0.922		0.000		0.000	0.899	Pk Hr Factor	0.953		0.882		0.000		0.000	0.898

Prepared by National Data & Surveying Services

CLASSIFICATION

Camino Del Mar Bet. Coast Blvd & Jimmy Durante Blvd

Day: Wednesday
Date: 4/25/2018

City: Del Mar
Project #: CA18_4144_002

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	19	0	0	0	0	0	0	0	0	0	0	0	19
01:00	0	12	0	0	0	0	0	0	0	0	0	0	0	12
02:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
03:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
04:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
05:00	0	41	3	1	0	0	0	1	0	0	0	0	0	46
06:00	0	170	8	2	2	0	0	1	0	0	0	0	0	183
07:00	2	486	19	2	5	0	0	0	0	0	0	0	0	514
08:00	0	540	15	2	6	0	0	0	0	0	0	0	0	563
09:00	0	420	31	2	3	0	0	3	0	0	0	0	0	459
10:00	1	439	23	2	9	1	0	1	1	0	0	0	0	477
11:00	8	537	22	2	8	0	0	2	1	0	0	0	0	580
12:00 PM	1	581	23	2	7	0	0	0	0	0	0	0	0	614
13:00	0	527	32	2	6	1	0	0	0	0	0	0	0	568
14:00	1	504	22	2	7	0	0	0	0	0	0	0	0	536
15:00	4	678	32	2	7	1	0	0	0	0	0	0	0	724
16:00	1	803	38	3	10	0	0	0	0	0	0	0	0	855
17:00	3	756	18	2	4	0	0	0	0	0	0	0	0	783
18:00	1	491	17	2	4	0	0	0	0	0	0	0	0	515
19:00	2	375	4	1	4	0	0	0	0	0	0	0	0	386
20:00	0	206	4	1	1	0	0	1	0	0	0	0	0	213
21:00	0	131	0	1	1	0	0	0	0	0	0	0	0	133
22:00	0	62	1	0	0	0	0	0	0	0	0	0	0	63
23:00	0	37	0	0	0	0	0	0	0	0	0	0	0	37
Totals	24	7844	315	31	84	3		9	2					8312
% of Totals	0%	94%	4%	0%	1%	0%		0%	0%					100%

AM Volumes	11	2693	124	13	33	1	0	8	2	0	0	0	0	2885
% AM	0%	32%	1%	0%	0%	0%		0%	0%					35%
AM Peak Hour	11:00	08:00	09:00	06:00	10:00	10:00		09:00	10:00					11:00
Volume	8	540	31	2	9	1		3	1					580
PM Volumes	13	5151	191	18	51	2	0	1	0	0	0	0	0	5427
% PM	0%	62%	2%	0%	1%	0%		0%						65%
PM Peak Hour	15:00	16:00	16:00	16:00	16:00	13:00		20:00						16:00
Volume	4	803	38	3	10	1		1						855

Directional Peak Periods All Classes	AM 7-9 Volume	AM 7-9 %	NOON 12-2 Volume	NOON 12-2 %	PM 4-6 Volume	PM 4-6 %	Off Peak Volumes Volume	Off Peak Volumes %
	1077	13%	1182	14%	1638	20%	4415	53%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Camino Del Mar Bet. Coast Blvd & Jimmy Durante Blvd

Day: Wednesday
Date: 4/25/2018

City: Del Mar
Project #: CA18_4144_002

DAILY TOTALS	NB	SB	EB	WB	Total
	4,105	4,207	0	0	8,312

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		6		0	0	6		12:00	75		75		0	0	150	
00:15	2		4		0	0	6		12:15	75		74		0	0	149	
00:30	3		1		0	0	4		12:30	73		77		0	0	150	
00:45	2	7	1	12	0	0	3	19	12:45	88	311	77	303	0	0	165	614
01:00	1		3		0	0	4		13:00	59		82		0	0	141	
01:15	0		2		0	0	2		13:15	72		63		0	0	135	
01:30	2		1		0	0	3		13:30	79		65		0	0	144	
01:45	1	4	2	8	0	0	3	12	13:45	70	280	78	288	0	0	148	568
02:00	2		1		0	0	3		14:00	50		62		0	0	112	
02:15	0		1		0	0	1		14:15	73		77		0	0	150	
02:30	1		0		0	0	1		14:30	69		53		0	0	122	
02:45	1	4	0	2	0	0	1	6	14:45	86	278	66	258	0	0	152	536
03:00	3		1		0	0	4		15:00	100		66		0	0	166	
03:15	1		1		0	0	2		15:15	101		67		0	0	168	
03:30	0		1		0	0	1		15:30	115		77		0	0	192	
03:45	0	4	0	3	0	0		7	15:45	132	448	66	276	0	0	198	724
04:00	3		2		0	0	5		16:00	146		70		0	0	216	
04:15	2		1		0	0	3		16:15	139		83		0	0	222	
04:30	2		5		0	0	7		16:30	133		62		0	0	195	
04:45	2	9	2	10	0	0	4	19	16:45	141	559	81	296	0	0	222	855
05:00	1		3		0	0	4		17:00	108		57		0	0	165	
05:15	4		5		0	0	9		17:15	137		74		0	0	211	
05:30	3		7		0	0	10		17:30	125		86		0	0	211	
05:45	10	18	13	28	0	0	23	46	17:45	114	484	82	299	0	0	196	783
06:00	8		21		0	0	29		18:00	81		61		0	0	142	
06:15	12		22		0	0	34		18:15	78		54		0	0	132	
06:30	18		43		0	0	61		18:30	76		54		0	0	130	
06:45	15	53	44	130	0	0	59	183	18:45	61	296	50	219	0	0	111	515
07:00	28		89		0	0	117		19:00	59		64		0	0	123	
07:15	18		87		0	0	105		19:15	54		47		0	0	101	
07:30	25		102		0	0	127		19:30	36		60		0	0	96	
07:45	38	109	127	405	0	0	165	514	19:45	27	176	39	210	0	0	66	386
08:00	36		91		0	0	127		20:00	33		36		0	0	69	
08:15	39		115		0	0	154		20:15	26		29		0	0	55	
08:30	38		116		0	0	154		20:30	24		31		0	0	55	
08:45	39	152	89	411	0	0	128	563	20:45	17	100	17	113	0	0	34	213
09:00	50		70		0	0	120		21:00	21		25		0	0	46	
09:15	47		77		0	0	124		21:15	13		22		0	0	35	
09:30	48		56		0	0	104		21:30	7		22		0	0	29	
09:45	45	190	66	269	0	0	111	459	21:45	10	51	13	82	0	0	23	133
10:00	52		56		0	0	108		22:00	12		14		0	0	26	
10:15	50		60		0	0	110		22:15	11		10		0	0	21	
10:30	58		72		0	0	130		22:30	4		5		0	0	9	
10:45	64	224	65	253	0	0	129	477	22:45	6	33	1	30	0	0	7	63
11:00	70		69		0	0	139		23:00	6		8		0	0	14	
11:15	76		77		0	0	153		23:15	6		3		0	0	9	
11:30	74		63		0	0	137		23:30	3		3		0	0	6	
11:45	77	297	74	283	0	0	151	580	23:45	3	18	5	19	0	0	8	37
TOTALS		1071		1814				**2885**	**TOTALS**		3034		2393				**5427**
SPLIT %		37.1%		62.9%				**34.7%**	**SPLIT %**		55.9%		44.1%				**65.3%**

DAILY TOTALS	NB	SB	EB	WB	Total
	4,105	4,207	0	0	8,312

AM Peak Hour	11:15		07:45					**07:45**	**PM Peak Hour**	16:00		12:15					**16:00**
AM Pk Volume	302		449					**600**	**PM Pk Volume**	559		310					**855**
Pk Hr Factor	0.981		0.884					**0.909**	**Pk Hr Factor**	0.957		0.945					**0.963**
7 - 9 Volume	261		816		0		0	**1077**	**4 - 6 Volume**	1043		595		0		0	**1638**
7 - 9 Peak Hour	08:00		07:45					**07:45**	**4 - 6 Peak Hour**	16:00		17:00					**16:00**
7 - 9 Pk Volume	152		449		0		0	**600**	**4 - 6 Pk Volume**	559		299		0		0	**855**
Pk Hr Factor	0.974		0.884		0.000		0.000	**0.909**	**Pk Hr Factor**	0.957		0.869		0.000		0.000	**0.963**

Prepared by National Data & Surveying Services

CLASSIFICATION

Jimmy Durante Blvd Bet. Via De La Valle & S Fair Access

Day: Wednesday
Date: 4/25/2018

City: Del Mar
Project #: CA18_4144_003

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	25	1	0	0	0	0	0	0	0	0	0	0	26
01:00	0	11	0	0	0	1	0	0	0	0	0	0	0	12
02:00	0	11	2	0	0	0	0	0	0	0	0	0	0	13
03:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
04:00	0	20	2	0	0	0	0	1	0	0	0	0	0	23
05:00	0	65	1	0	0	0	0	0	0	0	0	0	0	66
06:00	1	255	12	0	3	2	0	1	2	0	0	0	0	276
07:00	0	474	24	0	7	3	0	4	0	0	0	0	0	512
08:00	0	692	35	0	14	2	0	0	1	0	0	0	0	744
09:00	0	650	45	0	17	2	0	1	0	0	0	0	0	715
10:00	0	602	29	1	13	1	0	1	2	0	0	0	0	649
11:00	0	705	41	0	24	1	0	1	0	0	0	0	0	772
12:00 PM	1	813	49	0	15	2	0	1	2	0	0	0	0	883
13:00	2	766	41	0	17	0	0	0	0	0	0	0	0	826
14:00	0	759	40	0	7	0	0	0	0	0	0	0	0	806
15:00	0	865	55	0	10	0	0	0	0	0	0	0	0	930
16:00	1	1011	58	0	10	0	0	0	0	0	0	0	0	1080
17:00	1	1127	29	0	8	0	0	0	0	0	0	0	0	1165
18:00	4	1167	32	0	8	0	0	0	0	0	0	0	0	1211
19:00	1	1107	33	0	6	0	0	1	0	0	0	0	0	1148
20:00	1	850	25	1	2	0	0	0	0	0	0	0	0	879
21:00	0	240	7	0	0	0	0	0	0	0	0	0	0	247
22:00	0	102	2	0	0	0	0	0	0	0	0	0	0	104
23:00	0	43	0	0	2	0	0	0	0	0	0	0	0	45
Totals	12	12369	563	2	163	14		11	7					13141
% of Totals	0%	94%	4%	0%	1%	0%		0%	0%					100%

AM Volumes	1	3519	192	1	78	12	0	9	5	0	0	0	0	3817
% AM	0%	27%	1%	0%	1%	0%		0%	0%					29%
AM Peak Hour	06:00	11:00	09:00	10:00	11:00	07:00		07:00	06:00					11:00
Volume	1	705	45	1	24	3		4	2					772
PM Volumes	11	8850	371	1	85	2	0	2	2	0	0	0	0	9324
% PM	0%	67%	3%	0%	1%	0%		0%	0%					71%
PM Peak Hour	18:00	18:00	16:00	20:00	13:00	12:00		12:00	12:00					18:00
Volume	4	1167	58	1	17	2		1	2					1211

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	1256		10%	1709		13%	2245		17%	7931		60%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Jimmy Durante Blvd Bet. Via De La Valle & S Fair Access

Day: Wednesday
Date: 4/25/2018

City: Del Mar
Project #: CA18_4144_003

DAILY TOTALS	NB	SB	EB	WB	Total
	7,589	5,552	0	0	13,141

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	7		2		0	0	9		12:00	106		108		0	0	214	
00:15	3		1		0	0	4		12:15	109		109		0	0	218	
00:30	3		4		0	0	7		12:30	117		106		0	0	223	
00:45	4	17	2	9	0	0	6	26	12:45	126	458	102	425	0	0	228	883
01:00	2		0		0	0	2		13:00	123		96		0	0	219	
01:15	4		0		0	0	4		13:15	114		94		0	0	208	
01:30	0		3		0	0	3		13:30	138		74		0	0	212	
01:45	3	9	0	3	0	0	3	12	13:45	118	493	69	333	0	0	187	826
02:00	3		2		0	0	5		14:00	114		80		0	0	194	
02:15	1		0		0	0	1		14:15	114		65		0	0	179	
02:30	4		0		0	0	4		14:30	138		72		0	0	210	
02:45	2	10	1	3	0	0	3	13	14:45	140	506	83	300	0	0	223	806
03:00	0		1		0	0	1		15:00	155		92		0	0	247	
03:15	2		1		0	0	3		15:15	155		73		0	0	228	
03:30	1		3		0	0	4		15:30	147		57		0	0	204	
03:45	0	3	1	6	0	0	1	9	15:45	169	626	82	304	0	0	251	930
04:00	2		1		0	0	3		16:00	170		87		0	0	257	
04:15	1		4		0	0	5		16:15	184		102		0	0	286	
04:30	2		3		0	0	5		16:30	185		90		0	0	275	
04:45	4	9	6	14	0	0	10	23	16:45	181	720	81	360	0	0	262	1080
05:00	6		9		0	0	15		17:00	184		95		0	0	279	
05:15	2		4		0	0	6		17:15	190		108		0	0	298	
05:30	4		15		0	0	19		17:30	136		134		0	0	270	
05:45	6	18	20	48	0	0	26	66	17:45	143	653	175	512	0	0	318	1165
06:00	10		36		0	0	46		18:00	126		216		0	0	342	
06:15	28		26		0	0	54		18:15	114		175		0	0	289	
06:30	12		53		0	0	65		18:30	124		169		0	0	293	
06:45	28	78	83	198	0	0	111	276	18:45	166	530	121	681	0	0	287	1211
07:00	42		61		0	0	103		19:00	179		94		0	0	273	
07:15	35		69		0	0	104		19:15	214		72		0	0	286	
07:30	59		59		0	0	118		19:30	237		57		0	0	294	
07:45	72	208	115	304	0	0	187	512	19:45	236	866	59	282	0	0	295	1148
08:00	86		112		0	0	198		20:00	174		35		0	0	209	
08:15	67		109		0	0	176		20:15	168		39		0	0	207	
08:30	51		118		0	0	169		20:30	309		25		0	0	334	
08:45	92	296	109	448	0	0	201	744	20:45	107	758	22	121	0	0	129	879
09:00	71		83		0	0	154		21:00	62		25		0	0	87	
09:15	94		99		0	0	193		21:15	43		17		0	0	60	
09:30	78		102		0	0	180		21:30	39		19		0	0	58	
09:45	75	318	113	397	0	0	188	715	21:45	29	173	13	74	0	0	42	247
10:00	78		75		0	0	153		22:00	22		14		0	0	36	
10:15	71		81		0	0	152		22:15	19		10		0	0	29	
10:30	95		71		0	0	166		22:30	14		7		0	0	21	
10:45	91	335	87	314	0	0	178	649	22:45	13	68	5	36	0	0	18	104
11:00	97		68		0	0	165		23:00	2		2		0	0	4	
11:15	89		92		0	0	181		23:15	12		4		0	0	16	
11:30	105		91		0	0	196		23:30	6		8		0	0	14	
11:45	118	409	112	363	0	0	230	772	23:45	8	28	3	17	0	0	11	45
TOTALS		1710		2107				3817	TOTALS		5879		3445				9324
SPLIT %		44.8%		55.2%				29.0%	SPLIT %		63.1%		36.9%				71.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	7,589	5,552	0	0	13,141

AM Peak Hour	11:45	07:45			11:45	PM Peak Hour	19:45	17:45			17:45
AM Pk Volume	450	454			885	PM Pk Volume	887	735			1242
Pk Hr Factor	0.953	0.962			0.962	Pk Hr Factor	0.718	0.851			0.908
7 - 9 Volume	504	752	0	0	1256	4 - 6 Volume	1373	872	0	0	2245
7 - 9 Peak Hour	08:00	07:45			08:00	4 - 6 Peak Hour	16:30	17:00			17:00
7 - 9 Pk Volume	296	454	0	0	744	4 - 6 Pk Volume	740	512	0	0	1165
Pk Hr Factor	0.804	0.962	0.000	0.000	0.925	Pk Hr Factor	0.974	0.731	0.000	0.000	0.916

Prepared by National Data & Surveying Services

CLASSIFICATION

Jimmy Durante Blvd Bet. S Fair Access & Camino Del Mar

Day: Wednesday
Date: 4/25/2018

City: Del Mar
Project #: CA18_4144_004

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	17	0	0	2	0	0	0	0	0	0	0	0	19
01:00	0	9	0	0	0	1	0	0	0	0	0	0	0	10
02:00	0	11	0	0	0	0	0	0	0	0	0	0	0	11
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	15	4	0	0	0	0	1	0	0	0	0	0	20
05:00	0	42	0	0	0	0	0	0	0	0	0	0	0	42
06:00	1	139	16	0	5	0	0	1	2	0	0	0	0	164
07:00	0	349	35	0	4	4	0	0	0	0	0	0	0	392
08:00	0	526	42	0	10	2	0	0	1	0	0	0	0	581
09:00	1	474	48	0	20	3	0	0	0	0	0	0	0	546
10:00	2	463	32	0	9	1	0	2	4	0	0	0	0	513
11:00	0	524	36	0	15	0	0	1	0	0	0	0	0	576
12:00 PM	3	580	43	0	11	2	0	0	1	0	0	0	0	640
13:00	5	602	37	0	13	0	0	0	0	0	0	0	0	657
14:00	0	573	35	0	0	0	0	0	0	0	0	0	0	608
15:00	2	764	37	0	12	0	0	0	0	0	0	0	0	815
16:00	6	825	42	0	5	1	0	0	0	0	0	0	0	879
17:00	3	867	27	0	4	0	0	0	0	0	0	0	0	901
18:00	1	616	12	0	2	0	0	1	0	0	0	0	0	632
19:00	3	432	9	0	1	0	0	0	0	0	0	0	0	445
20:00	0	293	11	0	1	0	0	0	0	0	0	0	0	305
21:00	0	190	2	0	1	0	0	0	0	0	0	0	0	193
22:00	0	92	2	0	1	0	0	1	0	0	0	0	0	96
23:00	0	42	0	0	0	0	0	0	0	0	0	0	0	42
Totals	27	8450	470		116	14		7	8					9092
% of Totals	0%	93%	5%		1%	0%		0%	0%					100%

AM Volumes	4	2574	213	0	65	11	0	5	7	0	0	0	0	2879
% AM	0%	28%	2%		1%	0%		0%	0%					32%
AM Peak Hour	10:00	08:00	09:00		09:00	07:00		10:00	10:00					08:00
Volume	2	526	48		20	4		2	4					581
PM Volumes	23	5876	257	0	51	3	0	2	1	0	0	0	0	6213
% PM	0%	65%	3%		1%	0%		0%	0%					68%
PM Peak Hour	16:00	17:00	12:00		13:00	12:00		18:00	12:00					17:00
Volume	6	867	43		13	2		1	1					901

Directional Peak Periods All Classes	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	973		11%	1297		14%	1780		20%	5042		55%

Classification Definitions

1 Motorcycles	**4** Buses	**7** > =4-Axle Single Units	**10** >=6-Axle Single Trailers	**13** >=7-Axle Multi-Trailers
2 Passenger Cars	**5** 2-Axle, 6-Tire Single Units	**8** <=4-Axle Single Trailers	**11** <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	**6** 3-Axle Single Units	**9** 5-Axle Single Trailers	**12** 6-Axle Multi-Trailers	

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Jimmy Durante Blvd Bet. S Fair Access & Camino Del Mar

Day: Wednesday
Date: 4/25/2018

City: Del Mar
Project #: CA18_4144_004

DAILY TOTALS	NB	SB	EB	WB	Total
	5,214	3,878	0	0	9,092

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	4		1		0	0	5		12:00	73		70		0	0	143	
00:15	1		1		0	0	2		12:15	93		76		0	0	169	
00:30	6		3		0	0	9		12:30	80		91		0	0	171	
00:45	2	13	1	6	0	0	3	19	12:45	91	337	66	303	0	0	157	640
01:00	2		1		0	0	3		13:00	95		85		0	0	180	
01:15	2		0		0	0	2		13:15	90		68		0	0	158	
01:30	0		2		0	0	2		13:30	101		62		0	0	163	
01:45	2	6	1	4	0	0	3	10	13:45	99	385	57	272	0	0	156	657
02:00	2		1		0	0	3		14:00	84		55		0	0	139	
02:15	3		0		0	0	3		14:15	96		49		0	0	145	
02:30	2		0		0	0	2		14:30	86		65		0	0	151	
02:45	2	9	1	2	0	0	3	11	14:45	102	368	71	240	0	0	173	608
03:00	0		0		0	0			15:00	123		82		0	0	205	
03:15	0		0		0	0			15:15	134		63		0	0	197	
03:30	1		2		0	0	3		15:30	134		52		0	0	186	
03:45	0	1	2	4	0	0	2	5	15:45	150	541	77	274	0	0	227	815
04:00	1		1		0	0	2		16:00	139		71		0	0	210	
04:15	1		2		0	0	3		16:15	164		71		0	0	235	
04:30	2		3		0	0	5		16:30	151		64		0	0	215	
04:45	6	10	4	10	0	0	10	20	16:45	166	620	53	259	0	0	219	879
05:00	3		4		0	0	7		17:00	164		85		0	0	249	
05:15	2		3		0	0	5		17:15	181		66		0	0	247	
05:30	4		8		0	0	12		17:30	137		65		0	0	202	
05:45	7	16	11	26	0	0	18	42	17:45	147	629	56	272	0	0	203	901
06:00	9		18		0	0	27		18:00	129		59		0	0	188	
06:15	12		12		0	0	24		18:15	100		53		0	0	153	
06:30	12		25		0	0	37		18:30	92		59		0	0	151	
06:45	24	57	52	107	0	0	76	164	18:45	72	393	68	239	0	0	140	632
07:00	26		43		0	0	69		19:00	55		53		0	0	108	
07:15	35		57		0	0	92		19:15	59		54		0	0	113	
07:30	48		47		0	0	95		19:30	63		50		0	0	113	
07:45	67	176	69	216	0	0	136	392	19:45	54	231	57	214	0	0	111	445
08:00	73		81		0	0	154		20:00	41		40		0	0	81	
08:15	55		79		0	0	134		20:15	36		35		0	0	71	
08:30	43		90		0	0	133		20:30	43		54		0	0	97	
08:45	77	248	83	333	0	0	160	581	20:45	33	153	23	152	0	0	56	305
09:00	67		58		0	0	125		21:00	36		27		0	0	63	
09:15	67		67		0	0	134		21:15	28		12		0	0	40	
09:30	60		79		0	0	139		21:30	30		22		0	0	52	
09:45	60	254	88	292	0	0	148	546	21:45	22	116	16	77	0	0	38	193
10:00	65		60		0	0	125		22:00	24		14		0	0	38	
10:15	67		57		0	0	124		22:15	15		9		0	0	24	
10:30	59		62		0	0	121		22:30	14		5		0	0	19	
10:45	73	264	70	249	0	0	143	513	22:45	10	63	5	33	0	0	15	96
11:00	62		55		0	0	117		23:00	5		1		0	0	6	
11:15	82		82		0	0	164		23:15	9		5		0	0	14	
11:30	76		65		0	0	141		23:30	7		7		0	0	14	
11:45	78	298	76	278	0	0	154	576	23:45	5	26	3	16	0	0	8	42
TOTALS		1352		1527				2879	TOTALS		3862		2351				6213
SPLIT %		47.0%		53.0%				31.7%	SPLIT %		62.2%		37.8%				68.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	5,214	3,878	0	0	9,092

AM Peak Hour	11:45	08:00					11:45		PM Peak Hour	16:30	12:15					16:30		
AM Pk Volume	324	333					637		PM Pk Volume	662	318					930		
Pk Hr Factor	0.871	0.925					0.931		Pk Hr Factor	0.914	0.874					0.934		
7 - 9 Volume	424	549	0	0			973		4 - 6 Volume	1249	531	0	0			1780		
7 - 9 Peak Hour	08:00	08:00					08:00		4 - 6 Peak Hour	16:30	16:15					16:30		
7 - 9 Pk Volume	248	333	0	0			581		4 - 6 Pk Volume	662	273	0	0			930		
Pk Hr Factor	0.805	0.925	0.000	0.000			0.908		Pk Hr Factor	0.914	0.803	0.000	0.000			0.934		

Prepared by National Data & Surveying Services

CLASSIFICATION

Via De La Valle Bet. Highway 101 & Jimmy Durante Blvd

Day: Wednesday
Date: 4/25/2018

City: Del Mar
Project #: CA18_4144_005

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	53	1	0	0	0	0	0	0	0	0	0	0	54
01:00	0	30	2	0	0	0	0	0	0	0	0	0	0	32
02:00	0	19	0	0	1	0	0	0	0	0	0	0	0	20
03:00	0	21	1	0	0	0	0	0	0	0	0	0	0	22
04:00	0	56	0	0	1	0	0	0	0	0	0	0	0	57
05:00	1	188	6	0	3	0	0	1	1	0	0	0	0	200
06:00	0	511	29	0	4	1	0	0	4	0	0	0	0	549
07:00	1	1113	51	0	12	4	0	3	4	0	0	0	0	1188
08:00	4	1242	63	0	24	6	0	4	5	1	0	0	0	1349
09:00	2	1101	63	0	28	8	0	0	5	0	0	0	0	1207
10:00	0	1019	56	1	16	4	0	0	3	0	0	0	0	1099
11:00	4	1168	68	0	20	4	0	1	3	0	0	0	0	1268
12:00 PM	2	1195	59	0	14	5	0	2	2	0	0	0	0	1279
13:00	2	1281	80	0	16	4	0	0	5	0	0	0	0	1388
14:00	3	1189	72	0	13	2	0	0	0	0	0	0	0	1279
15:00	6	1261	65	0	12	1	0	1	0	0	0	0	0	1346
16:00	4	1202	67	0	12	0	0	0	0	0	0	0	0	1285
17:00	4	1299	50	0	11	0	0	0	0	0	0	0	0	1364
18:00	2	1128	53	0	7	2	1	1	0	1	0	0	0	1195
19:00	2	798	29	0	3	0	0	0	0	0	0	0	0	832
20:00	0	631	25	0	3	0	0	0	0	0	0	0	0	659
21:00	1	410	14	0	1	0	0	0	0	0	0	0	0	426
22:00	0	214	12	0	0	0	0	0	0	0	0	0	0	226
23:00	0	165	8	0	1	0	0	0	0	0	0	0	0	174
Totals	38	17294	874	1	202	41	1	13	32	2				18498
% of Totals	0%	93%	5%	0%	1%	0%	0%	0%	0%	0%				100%

AM Volumes	12	6521	340	1	109	27	0	9	25	1	0	0	0	7045
% AM	0%	35%	2%	0%	1%	0%		0%	0%	0%				38%
AM Peak Hour	08:00	08:00	11:00	10:00	09:00	09:00		08:00	08:00	08:00				08:00
Volume	4	1242	68	1	28	8		4	5	1				1349
PM Volumes	26	10773	534	0	93	14	1	4	7	1	0	0	0	11453
% PM	0%	58%	3%		1%	0%	0%	0%	0%	0%				62%
PM Peak Hour	15:00	17:00	13:00		13:00	12:00	18:00	12:00	13:00	18:00				13:00
Volume	6	1299	80		16	5	1	2	5	1				1388

Directional Peak Periods All Classes	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	2537	14%	2667	14%	2649	14%	10645	58%

Classification Definitions

1 Motorcycles	**4** Buses	**7** > =4-Axle Single Units	**10** >=6-Axle Single Trailers	**13** >=7-Axle Multi-Trailers
2 Passenger Cars	**5** 2-Axle, 6-Tire Single Units	**8** <=4-Axle Single Trailers	**11** <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	**6** 3-Axle Single Units	**9** 5-Axle Single Trailers	**12** 6-Axle Multi-Trailers	

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Via De La Valle Bet. Highway 101 & Jimmy Durante Blvd

Day: Wednesday
Date: 4/25/2018

City: Del Mar
Project #: CA18_4144_005

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	9,094	9,404	18,498

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	8		6		14		12:00	0	0	164		179		343	
00:15	0	0	13		5		18		12:15	0	0	147		160		307	
00:30	0	0	4		7		11		12:30	0	0	146		161		307	
00:45	0	0	6	31	5	23	11	54	12:45	0	0	150	607	172	672	322	1279
01:00	0	0	5		8		13		13:00	0	0	162		164		326	
01:15	0	0	4		2		6		13:15	0	0	158		188		346	
01:30	0	0	4		6		10		13:30	0	0	183		169		352	
01:45	0	0	1	14	2	18	3	32	13:45	0	0	187	690	177	698	364	1388
02:00	0	0	6		2		8		14:00	0	0	177		163		340	
02:15	0	0	2		0		2		14:15	0	0	162		142		304	
02:30	0	0	3		3		6		14:30	0	0	172		125		297	
02:45	0	0	1	12	3	8	4	20	14:45	0	0	154	665	184	614	338	1279
03:00	0	0	2		2		4		15:00	0	0	182		165		347	
03:15	0	0	2		0		2		15:15	0	0	169		173		342	
03:30	0	0	4		4		8		15:30	0	0	171		171		342	
03:45	0	0	2	10	6	12	8	22	15:45	0	0	107	629	208	717	315	1346
04:00	0	0	3		6		9		16:00	0	0	171		193		364	
04:15	0	0	4		1		5		16:15	0	0	147		196		343	
04:30	0	0	10		10		20		16:30	0	0	122		172		294	
04:45	0	0	10	27	13	30	23	57	16:45	0	0	137	577	147	708	284	1285
05:00	0	0	10		25		35		17:00	0	0	132		187		319	
05:15	0	0	10		22		32		17:15	0	0	147		203		350	
05:30	0	0	19		35		54		17:30	0	0	166		186		352	
05:45	0	0	28	67	51	133	79	200	17:45	0	0	145	590	198	774	343	1364
06:00	0	0	35		44		79		18:00	0	0	166		157		323	
06:15	0	0	44		63		107		18:15	0	0	155		144		299	
06:30	0	0	66		90		156		18:30	0	0	155		158		313	
06:45	0	0	92	237	115	312	207	549	18:45	0	0	125	601	135	594	260	1195
07:00	0	0	128		110		238		19:00	0	0	118		136		254	
07:15	0	0	143		120		263		19:15	0	0	109		103		212	
07:30	0	0	190		139		329		19:30	0	0	109		83		192	
07:45	0	0	168	629	190	559	358	1188	19:45	0	0	97	433	77	399	174	832
08:00	0	0	199		144		343		20:00	0	0	106		74		180	
08:15	0	0	191		156		347		20:15	0	0	83		75		158	
08:30	0	0	198		147		345		20:30	0	0	97		74		171	
08:45	0	0	157	745	157	604	314	1349	20:45	0	0	81	367	69	292	150	659
09:00	0	0	139		172		311		21:00	0	0	64		50		114	
09:15	0	0	169		167		336		21:15	0	0	67		54		121	
09:30	0	0	124		160		284		21:30	0	0	44		56		100	
09:45	0	0	130	562	146	645	276	1207	21:45	0	0	39	214	52	212	91	426
10:00	0	0	138		140		278		22:00	0	0	38		27		65	
10:15	0	0	144		132		276		22:15	0	0	41		19		60	
10:30	0	0	111		145		256		22:30	0	0	41		24		65	
10:45	0	0	133	526	156	573	289	1099	22:45	0	0	21	141	15	85	36	226
11:00	0	0	140		155		295		23:00	0	0	23		18		41	
11:15	0	0	163		158		321		23:15	0	0	25		12		37	
11:30	0	0	137		171		308		23:30	0	0	33		9		42	
11:45	0	0	156	596	188	672	344	1268	23:45	0	0	43	124	11	50	54	174
TOTALS				3456		3589		7045	TOTALS				5638		5815		11453
SPLIT %				49.1%		50.9%		38.1%	SPLIT %				49.2%		50.8%		61.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	9,094	9,404	18,498

AM Peak Hour			07:45		11:30		07:45		PM Peak Hour			13:30		17:00		13:15	
AM Pk Volume			756		698		1393		PM Pk Volume			709		774		1402	
Pk Hr Factor			0.950		0.928		0.973		Pk Hr Factor			0.948		0.953		0.963	
7 - 9 Volume	0	0	1374		1163		2537		4 - 6 Volume	0	0	1167		1482		2649	
7 - 9 Peak Hour			07:45		07:45		07:45		4 - 6 Peak Hour			17:00		17:00		17:00	
7 - 9 Pk Volume	0	0	756		637		1393		4 - 6 Pk Volume	0	0	590		774		1364	
Pk Hr Factor	0.000	0.000	0.950		0.838		0.973		Pk Hr Factor	0.000	0.000	0.889		0.953		0.969	

National Data & Surveying Services

Intersection Turning Movement Count

Location: Hwy 101-Camino Del Mar & Via De La Valle
City: Del Mar
Control: Signalized

Project ID: 18-04143-001
Date: 4/25/2018

Total

NS/EW Streets:	Hwy 101-Camino Del Mar				Hwy 101-Camino Del Mar				Via De La Valle				Via De La Valle				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	1	0	1	2	0	0	0	1	0	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	2	29	15	0	55	88	2	1	1	22	4	0	29	9	24	0	281
7:15 AM	1	21	25	0	75	75	3	0	1	27	5	0	25	24	26	0	308
7:30 AM	1	28	25	1	97	94	4	1	0	35	6	0	20	14	36	0	362
7:45 AM	1	23	18	0	108	111	2	2	1	24	8	0	32	28	55	0	413
8:00 AM	2	32	38	2	97	75	0	2	1	35	5	0	27	28	25	0	369
8:15 AM	3	36	23	1	102	103	5	3	0	37	6	0	35	26	44	0	424
8:30 AM	1	43	39	1	98	102	6	4	0	42	5	0	37	17	53	0	448
8:45 AM	6	38	27	1	91	81	3	0	0	25	4	0	29	38	43	0	386
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	17	250	210	6	723	729	25	13	4	247	43	0	234	184	306	0	2991
APPROACH %'s :	3.52%	51.76%	43.48%	1.24%	48.52%	48.93%	1.68%	0.87%	1.36%	84.01%	14.63%	0.00%	32.32%	25.41%	42.27%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	7	134	118	4	405	391	13	11	2	138	24	0	131	99	177	0	1654
PEAK HR FACTOR :	0.583	0.779	0.756	0.500	0.938	0.881	0.542	0.688	0.500	0.821	0.750	0.000	0.885	0.884	0.805	0.000	0.923
	0.783				0.919				0.872				0.885				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	1	0	1	2	0	0	0	1	0	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	8	133	26	2	79	70	6	4	1	29	5	0	45	20	100	0	528
4:15 PM	6	153	41	1	46	73	0	2	1	20	5	0	38	33	90	0	509
4:30 PM	11	130	29	0	57	58	3	5	2	29	3	0	45	25	87	0	484
4:45 PM	9	132	33	3	58	76	2	5	1	32	8	0	28	14	84	0	485
5:00 PM	5	137	35	1	41	68	4	6	3	21	7	0	31	32	89	0	480
5:15 PM	5	113	38	3	61	62	6	1	4	26	3	0	55	26	104	0	507
5:30 PM	12	131	47	0	77	78	7	1	0	26	4	0	42	25	83	0	533
5:45 PM	12	101	39	1	63	70	4	7	1	23	5	0	39	30	86	0	481
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	68	1030	288	11	482	555	32	31	13	206	40	0	323	205	723	0	4007
APPROACH %'s :	4.87%	73.73%	20.62%	0.79%	43.82%	50.45%	2.91%	2.82%	5.02%	79.54%	15.44%	0.00%	25.82%	16.39%	57.79%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	34	548	129	6	240	277	11	16	5	110	21	0	156	92	361	0	2006
PEAK HR FACTOR :	0.773	0.895	0.787	0.500	0.759	0.911	0.458	0.800	0.625	0.859	0.656	0.000	0.867	0.697	0.903	0.000	0.950
	0.892				0.855				0.829				0.923				

Prepared by National Data & Surveying Services

Hwy 101-Camino Del Mar & Via De La Valle

Peak Hour Turning Movement Count

ID: 18-04143-001
City: Del Mar

Day: Wednesday
Date: 04/25/2018

PEAK HOURS

AM	07:45 AM - 08:45 AM
NOON	NONE
PM	04:00 PM - 05:00 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Hwy 101-Camino Del Mar — SOUTHBOUND

AM	13	391	405	11	324	AM
NOON	0	0	0	0	0	NOON
PM	11	277	240	16	930	PM

Via De La Valle — EASTBOUND

AM	NOON	PM	
119	0	137	
0	0	0	0
2	0	5	0
138	0	110	1
24	0	21	0

CONTROL

Signalized

TEV	1654	0	2006
	AM	NOON	PM
PHF	0.92		0.95

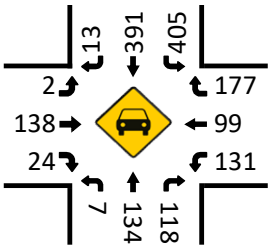
WESTBOUND — Via De La Valle

PM	NOON	AM	
361	0	177	1
92	0	99	1
156	0	131	1
0	0	0	0
479	0	661	

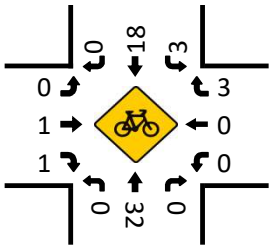
Hwy 101-Camino Del Mar — NORTHBOUND

PM	460	6	34	548	129	PM
NOON	0	0	0	0	0	NOON
AM	550	4	7	134	118	AM

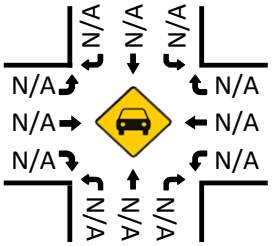
Total Vehicles (AM)



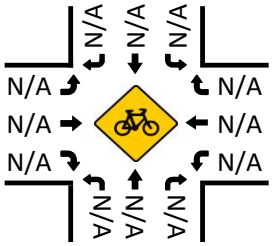
Bikes (AM)



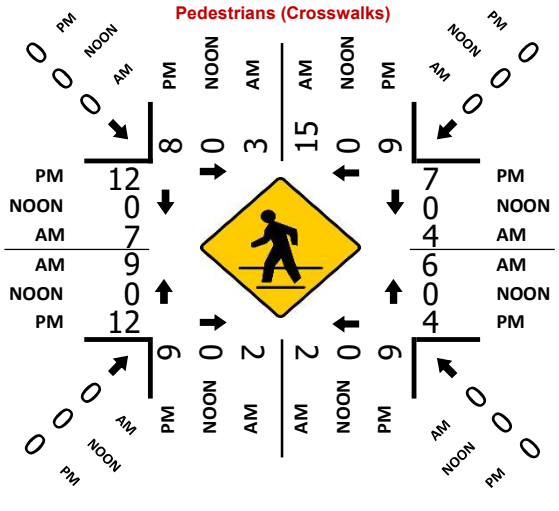
Total Vehicles (Noon)



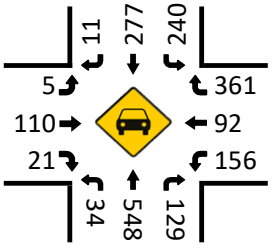
Bikes (NOON)



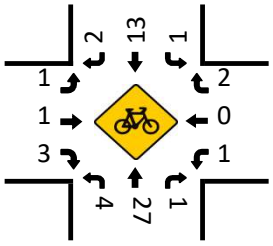
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Camino Del Mar & Coast Blvd
City: Del Mar
Control: 4-Way Stop (NB/SB/EB/WB)

Project ID: 18-04143-002
Date: 4/25/2018

Total

NS/EW Streets:	Camino Del Mar				Camino Del Mar				Coast Blvd				Coast Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	1	1	0	0	0.5	0.5	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	25	1	0	0	82	14	4	7	0	2	0	0	0	0	0	136
7:15 AM	1	17	0	0	0	85	10	4	12	0	5	0	2	0	1	0	137
7:30 AM	2	25	1	0	2	94	13	0	12	0	0	0	4	2	2	0	157
7:45 AM	4	35	0	0	0	126	13	0	14	1	4	0	2	0	1	0	200
8:00 AM	3	31	1	0	2	87	10	4	9	0	4	0	1	0	3	0	155
8:15 AM	2	33	0	0	1	103	22	2	15	0	5	0	1	0	1	0	185
8:30 AM	0	40	2	0	0	118	19	1	11	0	5	0	1	0	2	0	199
8:45 AM	3	38	0	0	1	80	17	2	15	0	2	0	1	0	1	0	160
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	16	244	5	0	6	775	118	17	95	1	27	0	12	2	11	0	1329
APPROACH %'s :	6.04%	92.08%	1.89%	0.00%	0.66%	84.61%	12.88%	1.86%	77.24%	0.81%	21.95%	0.00%	48.00%	8.00%	44.00%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	9	139	3	0	3	434	64	7	49	1	18	0	5	0	7	0	739
PEAK HR FACTOR :	0.563	0.869	0.375	0.000	0.375	0.861	0.727	0.438	0.817	0.250	0.900	0.000	0.625	0.000	0.583	0.000	0.924
	0.899				0.914				0.850				0.750				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	1	1	0	0	0.5	0.5	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	153	0	1	3	69	30	0	26	0	2	0	2	0	0	0	287
4:15 PM	6	125	1	2	0	70	24	3	30	0	5	0	1	0	0	0	267
4:30 PM	1	139	1	0	0	59	23	1	19	0	4	0	1	0	1	0	249
4:45 PM	3	131	0	1	0	76	23	0	27	0	5	0	0	0	1	0	267
5:00 PM	4	113	2	0	0	54	18	0	23	0	0	0	1	0	0	0	215
5:15 PM	1	134	0	1	1	75	23	1	33	0	4	0	1	0	0	0	274
5:30 PM	4	127	2	1	0	78	16	0	27	0	4	0	1	0	0	0	260
5:45 PM	2	99	1	0	0	80	18	1	19	0	4	0	0	0	0	0	224
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	22	1021	7	6	4	561	175	6	204	0	28	0	7	0	2	0	2043
APPROACH %'s :	2.08%	96.69%	0.66%	0.57%	0.54%	75.20%	23.46%	0.80%	87.93%	0.00%	12.07%	0.00%	77.78%	0.00%	22.22%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	11	548	2	4	3	274	100	4	102	0	16	0	4	0	2	0	1070
PEAK HR FACTOR :	0.458	0.895	0.500	0.500	0.250	0.901	0.833	0.333	0.850	0.000	0.800	0.000	0.500	0.000	0.500	0.000	0.932
	0.911				0.934				0.843				0.750				

Prepared by National Data & Surveying Services

Camino Del Mar & Coast Blvd

Peak Hour Turning Movement Count

ID: 18-04143-002
City: Del Mar

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Camino Del Mar — SOUTHBOUND

AM	64	434	3	7	202	AM
NOON	0	0	0	0	0	NOON
PM	100	274	3	4	656	PM

EASTBOUND (Coast Blvd)

AM	NOON	PM		
73	0	111		
0	0	0	0	
49	0	102	0	
1	0	0	0.5	
18	0	16	0.5	

WESTBOUND (Coast Blvd)

PM	NOON	AM	
2	0	7	0
0	0	0	1
4	0	5	0
0	0	0	0
5	0	7	

CONTROL

4-Way Stop (NB/SB/EB/WB)

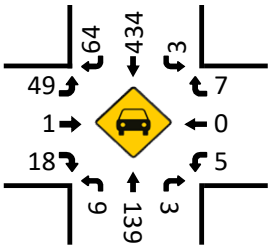
TEV	739 AM	0 NOON	1070 PM
PHF	0.92		0.93

NORTHBOUND — Camino Del Mar

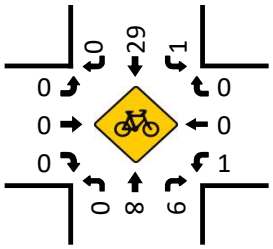
PM	298	4	11	548	2	PM
NOON	0	0	0	0	0	NOON
AM	457	0	9	139	3	AM

Turning movements: 1 1 1 0 (SB) | 0 1 2 0 (NB)

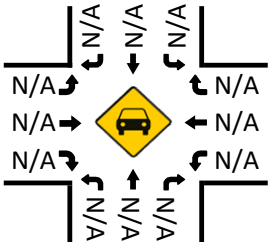
Total Vehicles (AM)



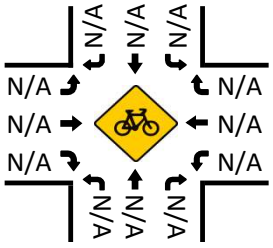
Bikes (AM)



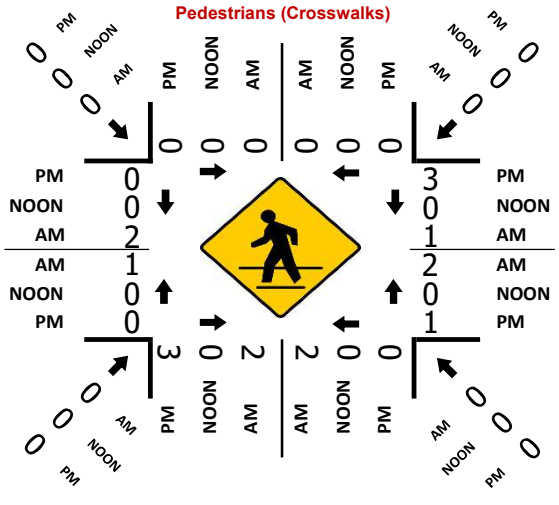
Total Vehicles (Noon)



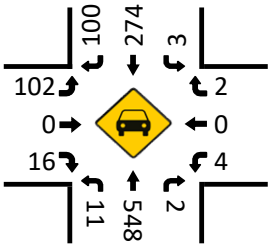
Bikes (NOON)



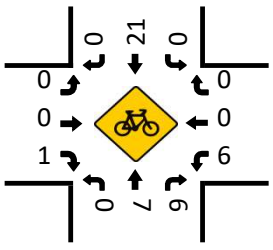
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Jimmy Durante Blvd & Via De La Valle
City: Del Mar
Control: Signalized

Project ID: 18-04143-003
Date: 4/25/2018

Total

NS/EW Streets:	Jimmy Durante Blvd				Jimmy Durante Blvd				Via De La Valle				Via De La Valle				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	2	0	2	1	1	0	1	2	0	0	2	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	3	12	35	0	90	14	11	0	4	118	5	0	54	99	67	0	512
7:15 AM	4	7	39	0	108	20	9	0	7	146	3	0	76	120	107	0	646
7:30 AM	6	8	54	0	146	16	10	0	11	164	7	0	63	113	140	0	738
7:45 AM	8	20	60	0	148	29	19	0	9	156	13	0	84	172	92	0	810
8:00 AM	4	36	52	0	144	38	21	0	15	176	10	0	84	135	66	0	781
8:15 AM	7	14	59	1	151	31	22	0	16	178	10	0	108	147	82	0	826
8:30 AM	4	9	68	0	83	24	7	0	13	199	12	0	95	149	99	0	762
8:45 AM	4	23	69	0	117	25	19	0	12	151	9	0	112	146	111	0	798
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	40	129	436	1	987	197	118	0	87	1288	69	0	676	1081	764	0	5873
APPROACH %'s :	6.60%	21.29%	71.95%	0.17%	75.81%	15.13%	9.06%	0.00%	6.02%	89.20%	4.78%	0.00%	26.81%	42.88%	30.31%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	23	79	239	1	526	122	69	0	53	709	45	0	371	603	339	0	3179
PEAK HR FACTOR :	0.719	0.549	0.879	0.250	0.871	0.803	0.784	0.000	0.828	0.891	0.865	0.000	0.859	0.876	0.856	0.000	0.962
	0.929				0.879				0.901				0.943				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	2	0	2	1	1	0	1	2	0	0	2	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	24	35	144	0	116	20	15	0	15	138	10	0	111	210	94	0	932
4:15 PM	20	53	158	0	93	23	12	0	12	151	7	0	85	197	123	0	934
4:30 PM	18	33	158	0	110	19	17	0	10	116	11	0	93	157	108	0	850
4:45 PM	15	42	151	0	79	18	14	0	9	103	18	0	100	142	110	0	801
5:00 PM	17	47	170	0	79	30	14	0	7	132	6	0	132	167	89	0	890
5:15 PM	30	52	175	0	89	34	18	0	8	107	19	0	158	156	71	0	917
5:30 PM	26	40	173	0	109	31	18	0	7	156	18	0	154	163	111	0	1006
5:45 PM	16	36	112	0	81	41	16	0	16	110	21	1	215	199	108	0	972
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	166	338	1241	0	756	216	124	0	84	1013	110	1	1048	1391	814	0	7302
APPROACH %'s :	9.51%	19.37%	71.12%	0.00%	68.98%	19.71%	11.31%	0.00%	6.95%	83.86%	9.11%	0.08%	32.22%	42.76%	25.02%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	89	175	630	0	358	136	66	0	38	505	64	1	659	685	379	0	3785
PEAK HR FACTOR :	0.742	0.841	0.900	0.000	0.821	0.829	0.917	0.000	0.594	0.809	0.762	0.250	0.766	0.861	0.854	0.000	0.941
	0.870				0.886				0.840				0.825				

Prepared by National Data & Surveying Services

Jimmy Durante Blvd & Via De La Valle

Peak Hour Turning Movement Count

ID: 18-04143-003
City: Del Mar

Day: Wednesday
Date: 04/25/2018

PEAK HOURS

AM	07:45 AM - 08:45 AM
NOON	NONE
PM	05:00 PM - 06:00 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Jimmy Durante Blvd — SOUTHBOUND

AM	69	122	526	0	471	AM
NOON	0	0	0	0	0	NOON
PM	66	136	358	0	592	PM

Via De La Valle — EASTBOUND

AM	NOON	PM		
695	0	841		
0	0	1	0	
53	0	38	1	
709	0	505	2	
45	0	64	0	
AM	NOON	PM		

Via De La Valle — WESTBOUND

PM	NOON	AM		
379	0	339	0	
685	0	603	2	
659	0	371	2	
0	0	0	0	
1493	0	1474		
PM	NOON	AM		

Jimmy Durante Blvd — NORTHBOUND

PM	859	0	89	175	630	PM
NOON	0	0	0	0	0	NOON
AM	539	1	23	79	239	AM

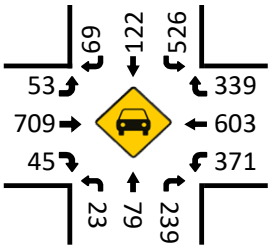
	1	1	2	0
	0	1	1	2

CONTROL

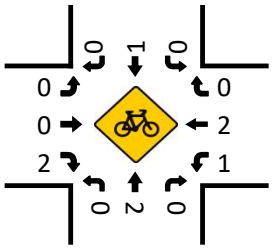
Signalized

TEV	3179 AM	0 NOON	3785 PM
PHF	0.96		0.94

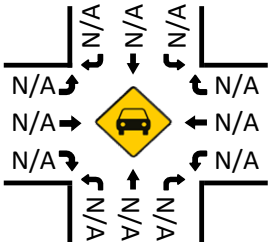
Total Vehicles (AM)



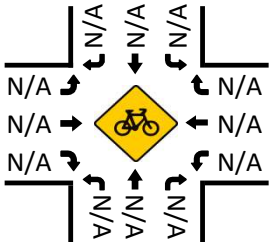
Bikes (AM)



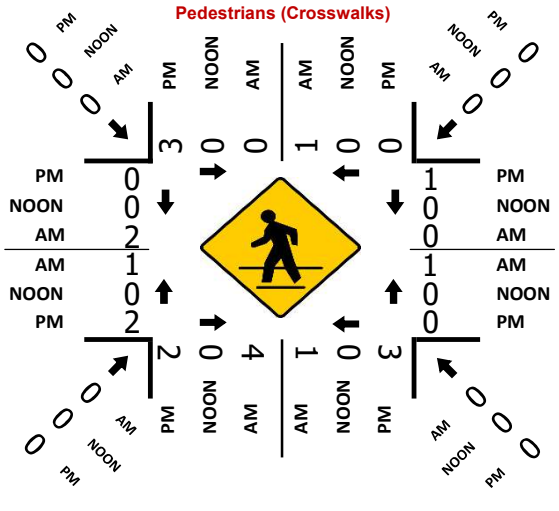
Total Vehicles (Noon)



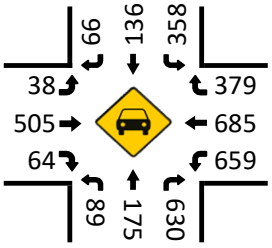
Bikes (NOON)



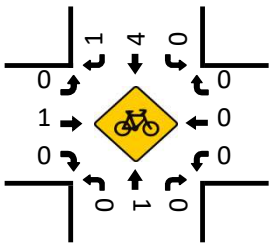
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Jimmy Durante Blvd & San Dieguito Dr
City: Del Mar
Control: 3-Way Yield (NB/SB/WB)

Project ID: 18-04143-004
Date: 4/25/2018

Total

NS/EW Streets:	Jimmy Durante Blvd				Jimmy Durante Blvd				San Dieguito Dr				San Dieguito Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	37	0	0	6	45	2	0	0	0	0	0	2	0	3	0	95
7:15 AM	0	28	1	0	6	63	1	0	0	0	0	0	1	0	4	0	104
7:30 AM	0	44	3	0	6	43	0	1	0	5	1	0	4	2	9	0	118
7:45 AM	0	61	2	0	9	89	3	0	0	0	0	0	3	2	8	0	177
8:00 AM	0	73	6	0	8	91	4	0	2	0	1	0	2	0	11	0	198
8:15 AM	0	55	1	0	10	100	0	0	0	2	1	0	3	0	6	0	178
8:30 AM	0	41	1	0	3	104	1	1	0	0	0	0	2	2	9	0	164
8:45 AM	4	77	1	0	10	87	1	0	3	0	2	0	5	0	7	0	197
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	4	416	15	0	58	622	12	2	5	7	5	0	22	6	57	0	1231
APPROACH %'s :	0.92%	95.63%	3.45%	0.00%	8.36%	89.63%	1.73%	0.29%	29.41%	41.18%	29.41%	0.00%	25.88%	7.06%	67.06%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	4	246	9	0	31	382	6	1	5	2	4	0	12	2	33	0	737
PEAK HR FACTOR :	0.250	0.799	0.375	0.000	0.775	0.918	0.375	0.250	0.417	0.250	0.500	0.000	0.600	0.250	0.750	0.000	0.931
		0.790				0.955				0.550				0.904			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	130	5	0	7	75	2	0	1	0	2	0	2	1	11	0	236
4:15 PM	0	158	9	1	6	70	1	1	3	0	0	0	1	0	16	0	266
4:30 PM	0	157	6	0	16	63	1	0	8	0	0	0	3	1	13	0	268
4:45 PM	1	161	4	0	11	52	2	0	2	0	1	1	1	0	10	0	246
5:00 PM	1	161	6	1	7	72	0	0	2	0	0	0	2	0	15	0	267
5:15 PM	0	180	4	0	9	69	0	2	0	0	0	0	0	0	6	0	270
5:30 PM	1	141	7	0	12	60	3	0	1	0	2	0	1	0	6	0	234
5:45 PM	0	142	12	0	4	58	2	1	1	1	0	0	2	1	7	0	231
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	1230	53	2	72	519	11	4	18	1	5	1	12	3	84	0	2018
APPROACH %'s :	0.23%	95.50%	4.11%	0.16%	11.88%	85.64%	1.82%	0.66%	72.00%	4.00%	20.00%	4.00%	12.12%	3.03%	84.85%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	2	659	20	1	43	256	3	2	12	0	1	1	6	1	44	0	1051
PEAK HR FACTOR :	0.500	0.915	0.833	0.250	0.672	0.889	0.375	0.250	0.375	0.000	0.250	0.250	0.500	0.250	0.733	0.000	0.973
		0.927				0.950				0.438				0.750			

Prepared by National Data & Surveying Services

Jimmy Durante Blvd & San Dieguito Dr

Peak Hour Turning Movement Count

ID: 18-04143-004
City: Del Mar

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
08:00 AM - 09:00 AM	07:00 AM - 09:00 AM
NONE	NONE
04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

Jimmy Durante Blvd — SOUTHBOUND

AM	6	382	31	1	285	AM
NOON	0	0	0	0	0	NOON
PM	3	256	43	2	717	PM

San Dieguito Dr — EASTBOUND

AM	NOON	PM	
12	0	7	
0	0	1	0
5	0	12	0
2	0	0	0
4	0	1	1
AM	NOON	PM	

WESTBOUND — San Dieguito Dr

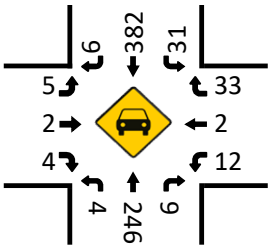
PM	NOON	AM	
44	0	33	1
1	0	2	0
6	0	12	0
0	0	0	0
63	0	42	
PM	NOON	AM	

NORTHBOUND — Jimmy Durante Blvd

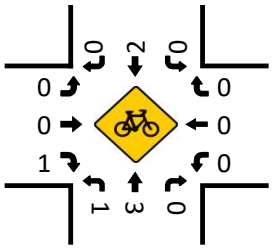
PM	264	1	2	659	20	PM
NOON	0	0	0	0	0	NOON
AM	398	0	4	246	9	AM

CONTROL			
3-Way Yield (NB/SB/WB)			
TEV	737 AM	0 NOON	1051 PM
PHF	0.93		0.97

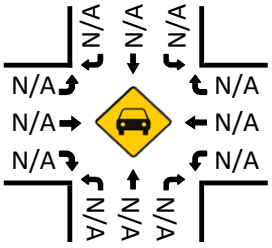
Total Vehicles (AM)



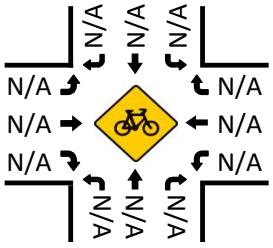
Bikes (AM)



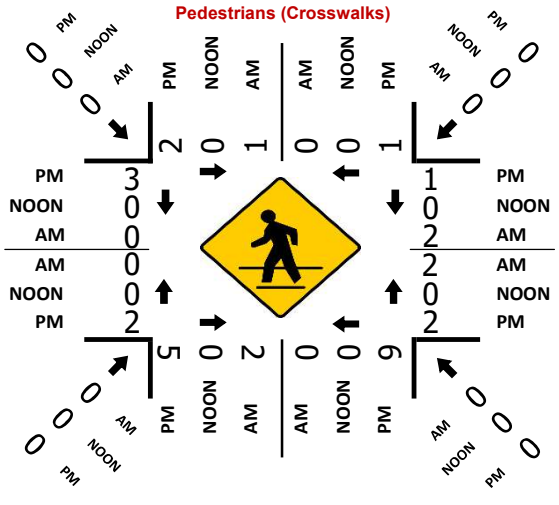
Total Vehicles (Noon)



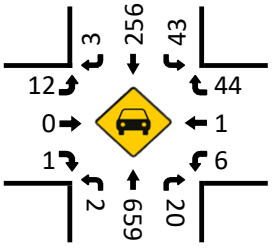
Bikes (NOON)



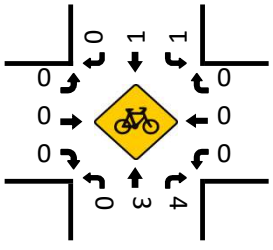
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



National Data & Surveying Services Intersection Turning Movement Count

Location: Camino Del Mar & L'Auberge Del Mar/Plaza Parking
City: Del Mar
Control: Signalized

Project ID: 18-04155-001
Date: 5/3/2018

Total

NS/EW Streets:	Camino Del Mar				Camino Del Mar				L'Auberge Del Mar/Plaza Parking				L'Auberge Del Mar/Plaza Parking				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0.3	0.3	0.3	0	1	0.5	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	3	55	0	1	1	99	5	6	4	0	3	0	0	0	0	0	177
7:15 AM	2	52	1	0	1	118	1	6	3	0	1	0	0	0	0	0	185
7:30 AM	4	53	0	0	4	178	2	6	1	0	2	0	0	0	1	0	251
7:45 AM	3	87	0	0	3	176	5	9	0	0	3	0	0	0	0	0	286
8:00 AM	1	108	0	0	1	140	5	7	1	0	5	0	0	0	1	0	269
8:15 AM	4	80	2	0	4	175	3	8	6	1	1	0	0	0	1	0	285
8:30 AM	2	92	5	1	3	186	5	8	5	0	3	0	0	0	1	0	311
8:45 AM	6	102	5	0	5	147	3	6	6	0	4	0	1	0	2	0	287
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	25	629	13	2	22	1219	29	56	26	1	22	0	1	0	6	0	2051
APPROACH %'s :	3.74%	94.02%	1.94%	0.30%	1.66%	91.93%	2.19%	4.22%	53.06%	2.04%	44.90%	0.00%	14.29%	0.00%	85.71%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	13	382	12	1	13	648	16	29	18	1	13	0	1	0	5	0	1152
PEAK HR FACTOR :	0.542	0.884	0.600	0.250	0.650	0.871	0.800	0.906	0.750	0.250	0.650	0.000	0.250	0.000	0.625	0.000	0.926
	0.903				0.874				0.800				0.500				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0.3	0.3	0.3	0	1	0.5	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	3	315	2	2	5	153	5	8	5	0	5	0	6	0	2	0	511
4:15 PM	1	298	6	1	4	128	4	15	4	0	4	0	2	0	6	0	473
4:30 PM	3	268	6	0	3	134	7	6	8	0	6	0	2	0	3	0	446
4:45 PM	1	273	5	2	7	135	5	5	5	0	2	0	7	0	5	0	452
5:00 PM	0	266	3	0	7	129	3	7	4	0	4	0	6	0	7	0	436
5:15 PM	4	226	4	1	9	121	4	9	10	0	5	0	3	0	10	0	406
5:30 PM	2	271	6	0	5	136	5	6	4	0	4	0	7	0	8	0	454
5:45 PM	3	221	7	1	6	121	4	4	9	0	3	0	2	0	5	0	386
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	17	2138	39	7	46	1057	37	60	49	0	33	0	35	0	46	0	3564
APPROACH %'s :	0.77%	97.14%	1.77%	0.32%	3.83%	88.08%	3.08%	5.00%	59.76%	0.00%	40.24%	0.00%	43.21%	0.00%	56.79%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	8	1154	19	5	19	550	21	34	22	0	17	0	17	0	16	0	1882
PEAK HR FACTOR :	0.667	0.916	0.792	0.625	0.679	0.899	0.750	0.567	0.688	0.000	0.708	0.000	0.607	0.000	0.667	0.000	0.921
	0.921				0.912				0.696				0.688				

Prepared by National Data & Surveying Services

Camino Del Mar & L'Auberge Del Mar/Plaza Parking

Peak Hour Turning Movement Count

ID: 18-04155-001
City: Del Mar

Day: Thursday
Date: 05/03/2018

PEAK HOURS	COUNT PERIODS
08:00 AM - 09:00 AM	07:00 AM - 09:00 AM
NONE	NONE
04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Camino Del Mar — SOUTHBOUND

AM	16	648	13	29	434	AM
NOON	0	0	0	0	0	NOON
PM	21	550	19	34	1226	PM

L'Auberge Del Mar/Plaza Parking — EASTBOUND

AM	NOON	PM		
29	0	29		
0	0	0	0	
18	0	22	0.3	
1	0	0	0.3	
13	0	17	0.3	
AM	NOON	PM		

L'Auberge Del Mar/Plaza Parking — WESTBOUND

PM	NOON	AM		
16	0	5	0.5	
0	0	0	0.5	
17	0	1	1	
0	0	0	0	
38	0	26		
PM	NOON	AM		

Camino Del Mar — NORTHBOUND

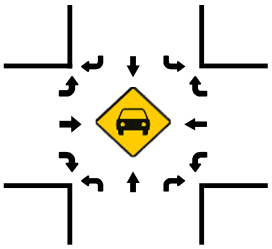
PM	589	5	8	1154	19	PM
NOON	0	0	0	0	0	NOON
AM	663	1	13	382	12	AM

	0	2	1	0
	0	1	2	0

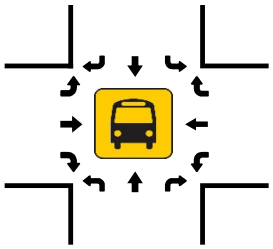
CONTROL: Signalized

TEV	1152 AM	0 NOON	1882 PM
PHF	0.93		0.92

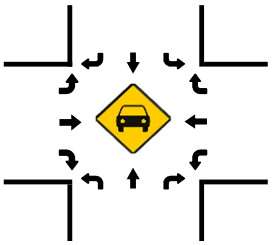
Total Vehicles (AM)



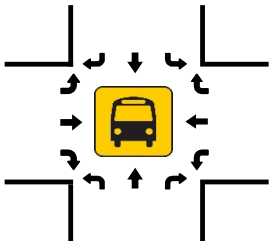
Total Vehicles (AM)



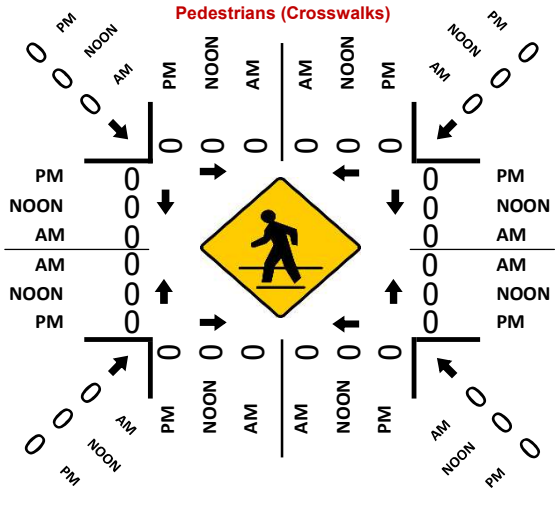
Total Vehicles (NOON)



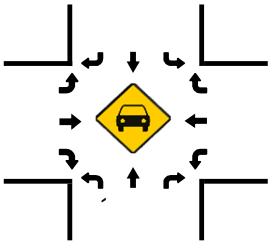
Total Vehicles (NOON)



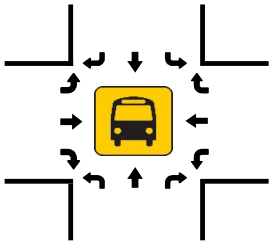
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services Intersection Turning Movement Count

Location: Camino Del Mar & 15th St
City: Del Mar
Control: Signalized

Project ID: 18-04155-002
Date: 5/3/2018

Total

NS/EW Streets:	Camino Del Mar				Camino Del Mar				15th St				15th St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0.5	0.5	1	0	1.5	0.5	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	10	44	5	1	17	75	11	3	5	1	8	0	3	1	11	0	195
7:15 AM	9	41	7	0	12	100	7	1	2	1	11	0	10	2	15	0	218
7:30 AM	12	40	8	0	19	154	12	2	0	0	15	0	6	4	16	0	288
7:45 AM	18	73	8	1	15	157	8	3	7	0	15	0	7	3	13	0	328
8:00 AM	18	69	17	1	20	103	10	4	11	4	15	0	8	0	24	0	304
8:15 AM	14	71	16	0	33	149	9	4	7	3	14	0	13	1	13	0	347
8:30 AM	16	70	20	0	18	142	12	5	11	1	23	0	4	5	11	0	338
8:45 AM	19	68	20	3	11	118	14	1	12	0	32	0	5	4	15	0	322
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	116	476	101	6	145	998	83	23	55	10	133	0	56	20	118	0	2340
APPROACH %'s :	16.60%	68.10%	14.45%	0.86%	11.61%	79.90%	6.65%	1.84%	27.78%	5.05%	67.17%	0.00%	28.87%	10.31%	60.82%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	66	283	61	2	86	551	39	16	36	8	67	0	32	9	61	0	1317
PEAK HR FACTOR :	0.917	0.969	0.763	0.500	0.652	0.877	0.813	0.800	0.818	0.500	0.728	0.000	0.615	0.450	0.635	0.000	0.949
	0.972				0.887				0.793				0.797				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0.5	0.5	1	0	1.5	0.5	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	21	265	6	1	23	124	18	3	13	3	17	0	12	4	31	0	541
4:15 PM	13	265	14	0	25	92	10	5	13	5	17	0	11	7	28	0	505
4:30 PM	22	225	12	0	13	122	17	3	14	1	31	0	8	4	34	0	506
4:45 PM	22	240	8	3	19	112	19	3	14	1	19	0	9	7	23	0	499
5:00 PM	17	217	17	0	7	103	22	1	10	1	24	0	3	10	29	0	461
5:15 PM	28	206	14	0	23	87	12	4	16	1	23	0	7	4	22	0	447
5:30 PM	22	235	22	0	15	108	25	1	6	4	22	0	3	7	23	0	493
5:45 PM	26	200	19	1	16	89	23	6	13	4	19	0	14	4	27	0	461
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	171	1853	112	5	141	837	146	26	99	20	172	0	67	47	217	0	3913
APPROACH %'s :	7.99%	86.55%	5.23%	0.23%	12.26%	72.78%	12.70%	2.26%	34.02%	6.87%	59.11%	0.00%	20.24%	14.20%	65.56%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	78	995	40	4	80	450	64	14	54	10	84	0	40	22	116	0	2051
PEAK HR FACTOR :	0.886	0.939	0.714	0.333	0.800	0.907	0.842	0.700	0.964	0.500	0.677	0.000	0.833	0.786	0.853	0.000	0.948
	0.953				0.905				0.804				0.947				

Prepared by National Data & Surveying Services

Camino Del Mar & 15th St

Peak Hour Turning Movement Count

ID: 18-04155-002
City: Del Mar

Day: Thursday
Date: 05/03/2018

PEAK HOURS		COUNT PERIODS
AM	07:45 AM - 08:45 AM	AM
NOON	NONE	NOON
PM	04:00 PM - 05:00 PM	PM

AM	39	551	86	16	396	AM
NOON	0	0	0	0	0	NOON
PM	64	450	80	14	1179	PM

PM	578	4	78	995	40	PM
NOON	0	0	0	0	0	NOON
AM	652	2	66	283	61	AM

EASTBOUND				
AM	NOON	PM		
114	0	164	⇦	
0	0	0	↶	0
36	0	54	↱	0.5
8	0	10	→	0.5
67	0	84	↷	1
AM	NOON	PM		

WESTBOUND				
PM	NOON	AM		
116	0	61	↶	1
22	0	9	←	0.5
40	0	32	↰	1.5
0	0	0	↷	0
130	0	155	⇨	
PM	NOON	AM		

0	2	1	0	
0	1	2	0	

CONTROL			
Signalized			
TEV	1317 AM	0 NOON	2051 PM
PHF	0.95		0.95

Camino Del Mar

SOUTHBOUND

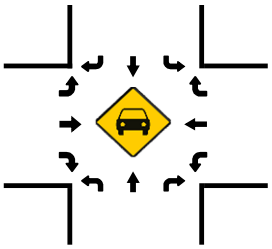
NORTHBOUND

Camino Del Mar

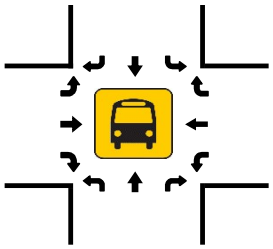
15th St

15th St

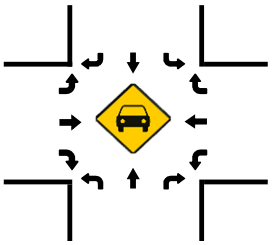
Total Vehicles (AM)



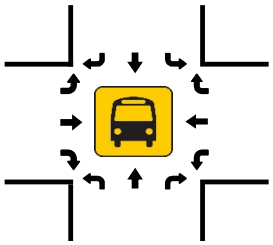
Total Vehicles (AM)



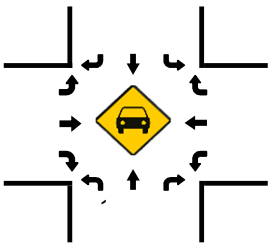
Total Vehicles (NOON)



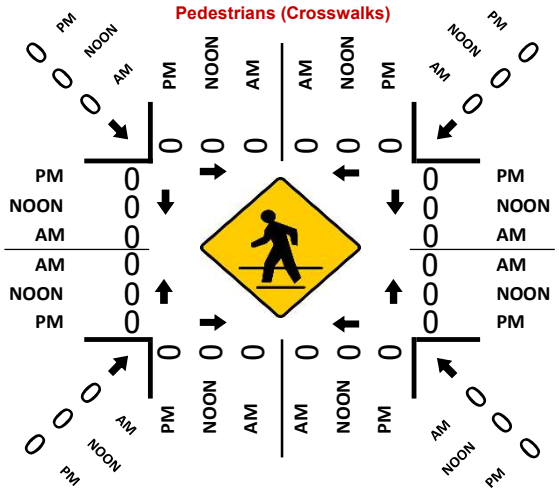
Total Vehicles (NOON)



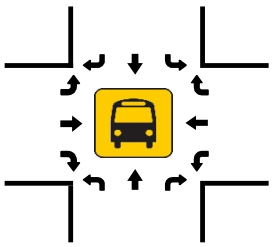
Total Vehicles (PM)



Pedestrians (Crosswalks)



Total Vehicles (PM)



Appendix B

Existing HCM Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	2	138	24	131	99	177	4	7	134	118	11	405
Future Volume (vph)	2	138	24	131	99	177	4	7	134	118	11	405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00	0.95	1.00		1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected		1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1825		1770	1863	1583		1770	3539	1583		1770
Flt Permitted		1.00		0.62	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1820		1161	1863	1583		1770	3539	1583		1770
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	150	26	142	108	192	4	8	146	128	12	440
RTOR Reduction (vph)	0	7	0	0	0	150	0	0	0	101	0	0
Lane Group Flow (vph)	0	171	0	142	108	42	0	12	146	27	0	452
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases		4			4		5	5	2		1	1
Permitted Phases	4			4		4				2		
Actuated Green, G (s)		14.7		14.7	14.7	14.7		1.2	14.0	14.0		22.2
Effective Green, g (s)		14.7		14.7	14.7	14.7		1.2	14.0	14.0		22.2
Actuated g/C Ratio		0.22		0.22	0.22	0.22		0.02	0.21	0.21		0.33
Clearance Time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0		3.0
Lane Grp Cap (vph)		397		253	406	345		31	736	329		583
v/s Ratio Prot					0.06			0.01	0.04			c0.26
v/s Ratio Perm		0.09		c0.12		0.03				0.02		
v/c Ratio		0.43		0.56	0.27	0.12		0.39	0.20	0.08		0.78
Uniform Delay, d1		22.7		23.4	21.8	21.1		32.7	22.0	21.5		20.3
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		0.8		2.8	0.4	0.2		7.8	0.1	0.1		6.4
Delay (s)		23.4		26.3	22.2	21.3		40.5	22.1	21.6		26.7
Level of Service		C		C	C	C		D	C	C		C
Approach Delay (s)		23.4			23.1				22.7			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	67.3	Sum of lost time (s)	16.4
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	391	13
Future Volume (vph)	391	13
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.9	
Lane Util. Factor	0.95	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3522	
Flt Permitted	1.00	
Satd. Flow (perm)	3522	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	425	14
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	437	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	35.0	
Effective Green, g (s)	35.0	
Actuated g/C Ratio	0.52	
Clearance Time (s)	5.9	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1831	
v/s Ratio Prot	c0.12	
v/s Ratio Perm		
v/c Ratio	0.24	
Uniform Delay, d1	8.8	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	8.9	
Level of Service	A	
Approach Delay (s)	17.9	
Approach LOS	B	

Intersection Summary

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	49	1	18	5	0	7	9	139	3	7	3	434
Future Vol, veh/h	49	1	18	5	0	7	9	139	3	7	3	434
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	53	1	20	5	0	8	10	151	3	8	3	472
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	10.1	9	10.5	15.3
HCM LOS	B	A	B	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	72%	42%	100%	0%	0%
Vol Thru, %	0%	98%	1%	0%	0%	100%	0%
Vol Right, %	0%	2%	26%	58%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	142	68	12	10	434	64
LT Vol	9	0	49	5	10	0	0
Through Vol	0	139	1	0	0	434	0
RT Vol	0	3	18	7	0	0	64
Lane Flow Rate	10	154	74	13	11	472	70
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.017	0.251	0.131	0.022	0.017	0.651	0.082
Departure Headway (Hd)	6.383	5.865	6.37	6.118	5.47	4.968	4.265
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	558	608	560	580	653	726	838
Service Time	4.153	3.635	4.147	3.91	3.211	2.709	2.005
HCM Lane V/C Ratio	0.018	0.253	0.132	0.022	0.017	0.65	0.084
HCM Control Delay	9.3	10.6	10.1	9	8.3	16.6	7.4
HCM Lane LOS	A	B	B	A	A	C	A
HCM 95th-tile Q	0.1	1	0.4	0.1	0.1	4.8	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	64
Future Vol, veh/h	64
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	70
Number of Lanes	1

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	18	1	13	1	0	5	14	382	12	29	13	648
Future Volume (vph)	18	1	13	1	0	5	14	382	12	29	13	648
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6		4.0	5.3			4.6	5.3
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95			1.00	0.95
Frt		0.94		1.00	0.85		1.00	1.00			1.00	1.00
Flt Protected		0.97		0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)		1711		1770	1583		1770	3523			1770	3527
Flt Permitted		1.00		1.00	1.00		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1759		1863	1583		1770	3523			1770	3527
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	19	1	14	1	0	5	15	411	13	31	14	697
RTOR Reduction (vph)	0	13	0	0	5	0	0	2	0	0	0	1
Lane Group Flow (vph)	0	21	0	1	0	0	15	422	0	0	45	713
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8								
Actuated Green, G (s)		1.8		1.8	1.8		0.8	15.0			1.9	16.7
Effective Green, g (s)		1.8		1.8	1.8		0.8	15.0			1.9	16.7
Actuated g/C Ratio		0.05		0.05	0.05		0.02	0.45			0.06	0.50
Clearance Time (s)		4.6		4.6	4.6		4.0	5.3			4.6	5.3
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		95		101	85		42	1591			101	1774
v/s Ratio Prot					0.00		0.01	0.12			c0.03	c0.20
v/s Ratio Perm		c0.01		0.00								
v/c Ratio		0.22		0.01	0.00		0.36	0.27			0.45	0.40
Uniform Delay, d1		15.0		14.9	14.9		15.9	5.7			15.1	5.1
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		1.2		0.0	0.0		5.1	0.1			3.1	0.1
Delay (s)		16.2		14.9	14.9		21.1	5.8			18.3	5.3
Level of Service		B		B	B		C	A			B	A
Approach Delay (s)		16.2			14.9			6.3				6.1
Approach LOS		B			B			A				A

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	33.2	Sum of lost time (s)	14.5
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	16
Future Volume (vph)	16
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	17
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

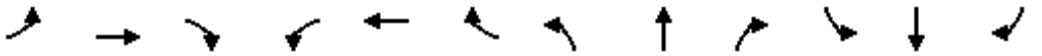
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	36	8	67	32	9	61	2	66	283	61	16	86
Future Volume (vph)	36	8	67	32	9	61	2	66	283	61	16	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	0.95			1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.97			1.00
Flt Protected		0.96	1.00	0.95	0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1789	1583	1681	1719	1583		1770	3445			1770
Flt Permitted		0.96	1.00	0.95	0.97	1.00		0.95	1.00			0.95
Satd. Flow (perm)		1789	1583	1681	1719	1583		1770	3445			1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	38	8	71	34	9	64	2	69	298	64	17	91
RTOR Reduction (vph)	0	0	64	0	0	59	0	0	10	0	0	0
Lane Group Flow (vph)	0	46	7	21	22	5	0	71	352	0	0	108
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases	7	7		8	8		5	5	2		1	1
Permitted Phases			7			8						
Actuated Green, G (s)		5.7	5.7	4.9	4.9	4.9		6.6	21.4			7.7
Effective Green, g (s)		5.7	5.7	4.9	4.9	4.9		6.6	21.4			7.7
Actuated g/C Ratio		0.10	0.10	0.08	0.08	0.08		0.11	0.37			0.13
Clearance Time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		174	154	140	143	132		199	1260			232
v/s Ratio Prot		c0.03		0.01	c0.01			0.04	0.10			c0.06
v/s Ratio Perm			0.00			0.00						
v/c Ratio		0.26	0.04	0.15	0.15	0.04		0.36	0.28			0.47
Uniform Delay, d1		24.5	23.9	24.9	24.9	24.6		24.0	13.1			23.5
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		0.8	0.1	0.5	0.5	0.1		1.1	0.1			1.5
Delay (s)		25.3	24.1	25.4	25.4	24.8		25.1	13.2			25.0
Level of Service		C	C	C	C	C		C	B			C
Approach Delay (s)		24.5			25.0				15.2			
Approach LOS		C			C				B			

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	58.5	Sum of lost time (s)	20.8
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	551	39
Future Volume (vph)	551	39
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3504	
Flt Permitted	1.00	
Satd. Flow (perm)	3504	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	580	41
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	618	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	22.8	
Effective Green, g (s)	22.8	
Actuated g/C Ratio	0.39	
Clearance Time (s)	5.3	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1365	
v/s Ratio Prot	c0.18	
v/s Ratio Perm		
v/c Ratio	0.45	
Uniform Delay, d1	13.2	
Progression Factor	1.00	
Incremental Delay, d2	0.2	
Delay (s)	13.5	
Level of Service	B	
Approach Delay (s)	15.2	
Approach LOS	B	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	709	45	371	603	339	24	79	239	526	122	69
Future Volume (vph)	53	709	45	371	603	339	24	79	239	526	122	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	0.88	0.97	1.00	1.00
Frt	1.00	0.99		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3507		3433	3348		1770	1863	2787	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3507		3433	3348		1770	1863	2787	3433	1863	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	55	739	47	386	628	353	25	82	249	548	127	72
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	225	0	0	56
Lane Group Flow (vph)	55	784	0	386	981	0	25	82	24	548	127	16
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases									2			1
Actuated Green, G (s)	7.6	32.7		18.0	43.2		10.6	10.6	10.6	25.0	25.0	25.0
Effective Green, g (s)	7.6	32.7		18.0	43.2		10.6	10.6	10.6	25.0	25.0	25.0
Actuated g/C Ratio	0.07	0.30		0.16	0.39		0.10	0.10	0.10	0.23	0.23	0.23
Clearance Time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	122	1044		562	1317		170	179	269	781	424	360
v/s Ratio Prot	0.03	0.22		c0.11	c0.29		0.01	c0.04		c0.16	0.07	
v/s Ratio Perm									0.01			0.01
v/c Ratio	0.45	0.75		0.69	0.74		0.15	0.46	0.09	0.70	0.30	0.05
Uniform Delay, d1	49.1	34.9		43.2	28.6		45.5	46.9	45.2	39.0	35.1	33.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	3.1		3.5	2.3		0.4	1.9	0.1	2.9	0.4	0.1
Delay (s)	51.7	38.0		46.7	30.9		45.9	48.7	45.3	41.8	35.5	33.1
Level of Service	D	D		D	C		D	D	D	D	D	C
Approach Delay (s)		38.9			35.4			46.2			39.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	109.8	Sum of lost time (s)	23.5
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	6.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	11	50	279	451
Demand Flow Rate, veh/h	11	51	284	460
Vehicles Circulating, veh/h	467	279	42	19
Vehicles Exiting, veh/h	12	47	436	311
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.3	4.9	5.9	7.7
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	11	51	284	460
Cap Entry Lane, veh/h	708	855	1083	1109
Entry HV Adj Factor	0.996	0.980	0.981	0.980
Flow Entry, veh/h	11	50	279	451
Cap Entry, veh/h	706	837	1063	1086
V/C Ratio	0.016	0.060	0.262	0.415
Control Delay, s/veh	5.3	4.9	5.9	7.7
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	5	110	21	156	92	361	6	34	548	129	16	240
Future Volume (vph)	5	110	21	156	92	361	6	34	548	129	16	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00	0.95	1.00		1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected		1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1821		1770	1863	1583		1770	3539	1583		1770
Flt Permitted		0.99		0.68	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1807		1259	1863	1583		1770	3539	1583		1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	116	22	164	97	380	6	36	577	136	17	253
RTOR Reduction (vph)	0	7	0	0	0	294	0	0	0	98	0	0
Lane Group Flow (vph)	0	136	0	164	97	86	0	42	577	38	0	270
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases		4			4		5	5	2		1	1
Permitted Phases	4			4		4				2		
Actuated Green, G (s)		17.1		17.1	17.1	17.1		4.5	21.2	21.2		20.6
Effective Green, g (s)		17.1		17.1	17.1	17.1		4.5	21.2	21.2		20.6
Actuated g/C Ratio		0.23		0.23	0.23	0.23		0.06	0.28	0.28		0.27
Clearance Time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0		3.0
Lane Grp Cap (vph)		410		285	423	359		105	996	445		484
v/s Ratio Prot					0.05			0.02	c0.16			c0.15
v/s Ratio Perm		0.08		c0.13		0.05				0.02		
v/c Ratio		0.33		0.58	0.23	0.24		0.40	0.58	0.09		0.56
Uniform Delay, d1		24.3		25.9	23.7	23.8		34.1	23.2	19.9		23.4
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		0.5		2.8	0.3	0.3		2.5	0.8	0.1		1.4
Delay (s)		24.8		28.7	24.0	24.1		36.6	24.0	20.0		24.8
Level of Service		C		C	C	C		D	C	C		C
Approach Delay (s)		24.8			25.3				24.0			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	16.4
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	277	11
Future Volume (vph)	277	11
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.9	
Lane Util. Factor	0.95	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3518	
Flt Permitted	1.00	
Satd. Flow (perm)	3518	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	292	12
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	301	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	37.3	
Effective Green, g (s)	37.3	
Actuated g/C Ratio	0.50	
Clearance Time (s)	5.9	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1742	
v/s Ratio Prot	0.09	
v/s Ratio Perm		
v/c Ratio	0.17	
Uniform Delay, d1	10.5	
Progression Factor	1.00	
Incremental Delay, d2	0.0	
Delay (s)	10.5	
Level of Service	B	
Approach Delay (s)	17.3	
Approach LOS	B	

Intersection Summary

Intersection	
Intersection Delay, s/veh	35.8
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Vol, veh/h	102	0	16	4	0	2	4	11	548	2	4	3
Future Vol, veh/h	102	0	16	4	0	2	4	11	548	2	4	3
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	110	0	17	4	0	2	4	12	589	2	4	3
Number of Lanes	0	1	0	0	1	0	0	1	1	0	0	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	12.9	10.5	56.7	12.3
HCM LOS	B	B	F	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	86%	67%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	0%	100%	0%
Vol Right, %	0%	0%	14%	33%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	550	118	6	7	274	100
LT Vol	15	0	102	4	7	0	0
Through Vol	0	548	0	0	0	274	0
RT Vol	0	2	16	2	0	0	100
Lane Flow Rate	16	591	127	6	8	295	108
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.029	0.988	0.263	0.014	0.013	0.474	0.152
Departure Headway (Hd)	6.519	6.012	7.462	7.656	6.299	5.793	5.083
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	549	603	481	466	568	622	704
Service Time	4.26	3.752	5.221	5.434	4.04	3.533	2.823
HCM Lane V/C Ratio	0.029	0.98	0.264	0.013	0.014	0.474	0.153
HCM Control Delay	9.5	58	12.9	10.5	9.1	13.7	8.7
HCM Lane LOS	A	F	B	B	A	B	A
HCM 95th-tile Q	0.1	14.4	1	0	0	2.5	0.5

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBT	SBR
Lane Configurations		
Traffic Vol, veh/h	274	100
Future Vol, veh/h	274	100
Peak Hour Factor	0.93	0.93
Heavy Vehicles, %	2	2
Mvmt Flow	295	108
Number of Lanes	1	1

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	22	0	17	17	0	16	5	8	1154	19	34	19
Future Volume (vph)	22	0	17	17	0	16	5	8	1154	19	34	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6			4.0	5.3			4.6
Lane Util. Factor		1.00		1.00	1.00			1.00	0.95			1.00
Frt		0.94		1.00	0.85			1.00	1.00			1.00
Flt Protected		0.97		0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)		1706		1770	1583			1770	3530			1770
Flt Permitted		1.00		1.00	1.00			0.95	1.00			0.95
Satd. Flow (perm)		1755		1863	1583			1770	3530			1770
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	0	18	18	0	17	5	9	1254	21	37	21
RTOR Reduction (vph)	0	40	0	0	16	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	2	0	18	1	0	0	14	1274	0	0	58
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8								
Actuated Green, G (s)		3.0		3.0	3.0			1.4	37.3			5.2
Effective Green, g (s)		3.0		3.0	3.0			1.4	37.3			5.2
Actuated g/C Ratio		0.05		0.05	0.05			0.02	0.62			0.09
Clearance Time (s)		4.6		4.6	4.6			4.0	5.3			4.6
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0			3.0
Lane Grp Cap (vph)		87		93	79			41	2194			153
v/s Ratio Prot					0.00			0.01	c0.36			c0.03
v/s Ratio Perm		0.00		c0.01								
v/c Ratio		0.02		0.19	0.01			0.34	0.58			0.38
Uniform Delay, d1		27.1		27.3	27.1			28.8	6.7			25.9
Progression Factor		1.00		1.00	1.00			0.84	1.86			1.00
Incremental Delay, d2		0.1		1.0	0.1			4.4	1.0			1.6
Delay (s)		27.2		28.4	27.1			28.7	13.5			27.4
Level of Service		C		C	C			C	B			C
Approach Delay (s)		27.2			27.8				13.7			
Approach LOS		C			C				B			

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	550	21
Future Volume (vph)	550	21
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3520	
Flt Permitted	1.00	
Satd. Flow (perm)	3520	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	598	23
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	619	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	41.7	
Effective Green, g (s)	41.7	
Actuated g/C Ratio	0.70	
Clearance Time (s)	5.3	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2446	
v/s Ratio Prot	c0.18	
v/s Ratio Perm		
v/c Ratio	0.25	
Uniform Delay, d1	3.4	
Progression Factor	1.00	
Incremental Delay, d2	0.2	
Delay (s)	3.6	
Level of Service	A	
Approach Delay (s)	5.7	
Approach LOS	A	

Intersection Summary

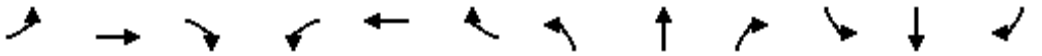
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	54	10	84	40	22	116	4	78	995	40	14	80
Future Volume (vph)	54	10	84	40	22	116	4	78	995	40	14	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	0.95			1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.99			1.00
Flt Protected		0.96	1.00	0.95	0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1788	1583	1681	1743	1583		1770	3519			1770
Flt Permitted		0.96	1.00	0.95	0.99	1.00		0.95	1.00			0.95
Satd. Flow (perm)		1788	1583	1681	1743	1583		1770	3519			1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	57	11	88	42	23	122	4	82	1047	42	15	84
RTOR Reduction (vph)	0	0	81	0	0	114	0	0	1	0	0	0
Lane Group Flow (vph)	0	68	7	32	33	8	0	86	1088	0	0	99
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases	7	7		8	8		5	5	2		1	1
Permitted Phases			7			8						
Actuated Green, G (s)		9.9	9.9	7.8	7.8	7.8		14.4	71.5			12.0
Effective Green, g (s)		9.9	9.9	7.8	7.8	7.8		14.4	71.5			12.0
Actuated g/C Ratio		0.08	0.08	0.06	0.06	0.06		0.12	0.60			0.10
Clearance Time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		147	130	109	113	102		212	2096			177
v/s Ratio Prot		c0.04		c0.02	0.02			0.05	c0.31			c0.06
v/s Ratio Perm			0.00			0.01						
v/c Ratio		0.46	0.06	0.29	0.29	0.08		0.41	0.52			0.56
Uniform Delay, d1		52.5	50.7	53.5	53.5	52.7		48.8	14.2			51.5
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.10
Incremental Delay, d2		2.3	0.2	1.5	1.4	0.3		1.3	0.9			3.8
Delay (s)		54.8	50.9	55.0	54.9	53.0		50.1	15.1			60.5
Level of Service		D	D	D	D	D		D	B			E
Approach Delay (s)		52.6			53.7				17.7			
Approach LOS		D			D				B			

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	450	64
Future Volume (vph)	450	64
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frt	0.98	
Flt Protected	1.00	
Satd. Flow (prot)	3473	
Flt Permitted	1.00	
Satd. Flow (perm)	3473	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	474	67
RTOR Reduction (vph)	5	0
Lane Group Flow (vph)	536	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	69.4	
Effective Green, g (s)	69.4	
Actuated g/C Ratio	0.58	
Clearance Time (s)	5.3	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2008	
v/s Ratio Prot	0.15	
v/s Ratio Perm		
v/c Ratio	0.27	
Uniform Delay, d1	12.6	
Progression Factor	1.09	
Incremental Delay, d2	0.3	
Delay (s)	14.0	
Level of Service	B	
Approach Delay (s)	21.2	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	505	64	659	685	379	89	175	630	358	136	66
Future Volume (vph)	39	505	64	659	685	379	89	175	630	358	136	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	0.88	0.97	1.00	1.00
Frt	1.00	0.98		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3480		3433	3350		1770	1863	2787	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3480		3433	3350		1770	1863	2787	3433	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	41	537	68	701	729	403	95	186	670	381	145	70
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	552	0	0	58
Lane Group Flow (vph)	41	600	0	701	1132	0	95	186	118	381	145	12
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases									2			1
Actuated Green, G (s)	7.1	29.8		32.2	55.0		22.8	22.8	22.8	21.6	21.6	21.6
Effective Green, g (s)	7.1	29.8		32.2	55.0		22.8	22.8	22.8	21.6	21.6	21.6
Actuated g/C Ratio	0.05	0.23		0.25	0.42		0.18	0.18	0.18	0.17	0.17	0.17
Clearance Time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	96	798		850	1418		310	326	489	570	309	263
v/s Ratio Prot	0.02	0.17		c0.20	c0.34		0.05	c0.10		c0.11	0.08	
v/s Ratio Perm									0.04			0.01
v/c Ratio	0.43	0.75		0.82	0.80		0.31	0.57	0.24	0.67	0.47	0.04
Uniform Delay, d1	59.4	46.6		46.2	32.6		46.7	49.1	46.1	50.8	49.0	45.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	4.0		6.5	3.2		0.6	2.4	0.3	3.0	1.1	0.1
Delay (s)	62.5	50.6		52.7	35.9		47.2	51.5	46.4	53.8	50.1	45.6
Level of Service	E	D		D	D		D	D	D	D	D	D
Approach Delay (s)		51.4			42.3			47.4			51.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	129.9	Sum of lost time (s)	23.5
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	11.0
Intersection LOS	B

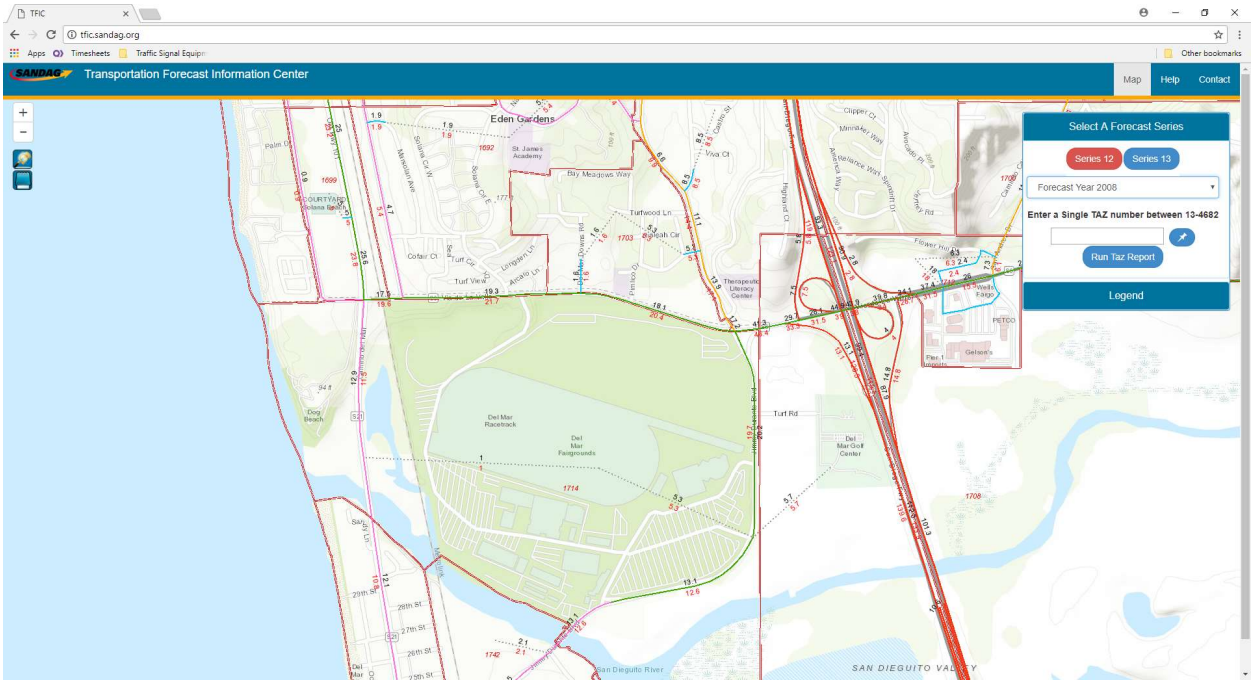
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	14	52	703	313
Demand Flow Rate, veh/h	14	53	717	319
Vehicles Circulating, veh/h	322	709	60	10
Vehicles Exiting, veh/h	7	68	276	752
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.6	7.8	13.6	6.0
Approach LOS	A	A	B	A

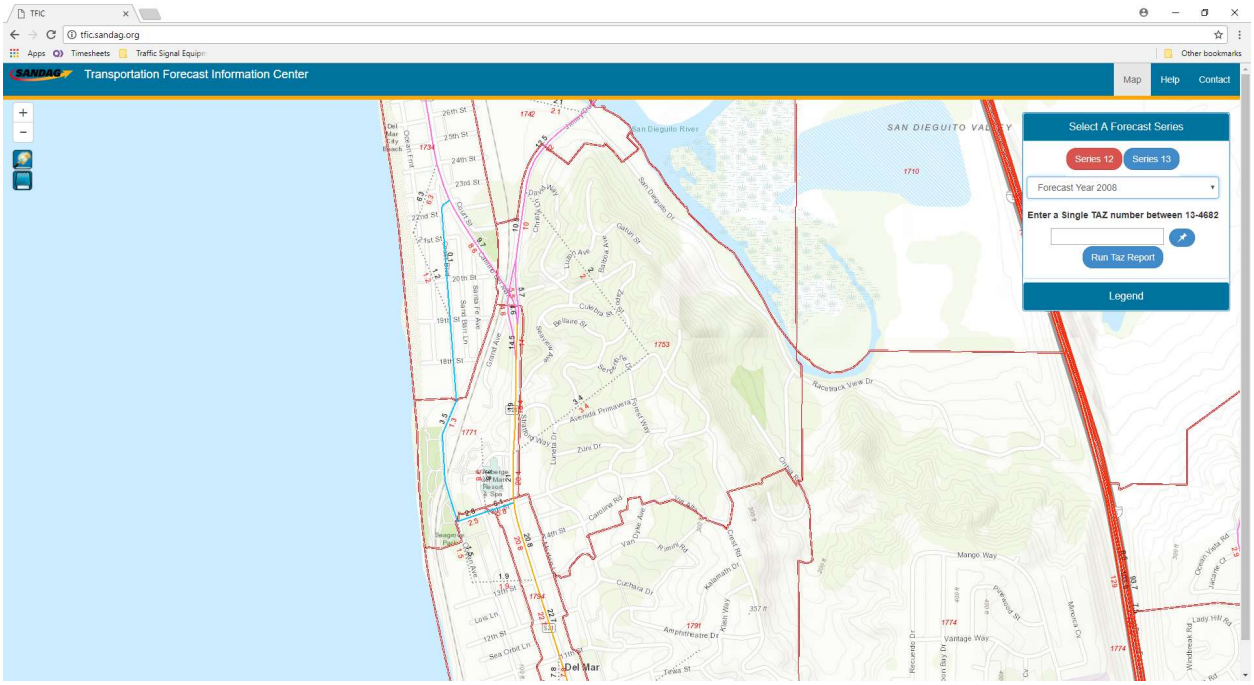
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	14	53	717	319
Cap Entry Lane, veh/h	819	556	1064	1119
Entry HV Adj Factor	1.000	0.981	0.981	0.980
Flow Entry, veh/h	14	52	703	313
Cap Entry, veh/h	819	545	1044	1097
V/C Ratio	0.017	0.095	0.674	0.285
Control Delay, s/veh	4.6	7.8	13.6	6.0
LOS	A	A	B	A
95th %tile Queue, veh	0	0	5	1

Appendix C

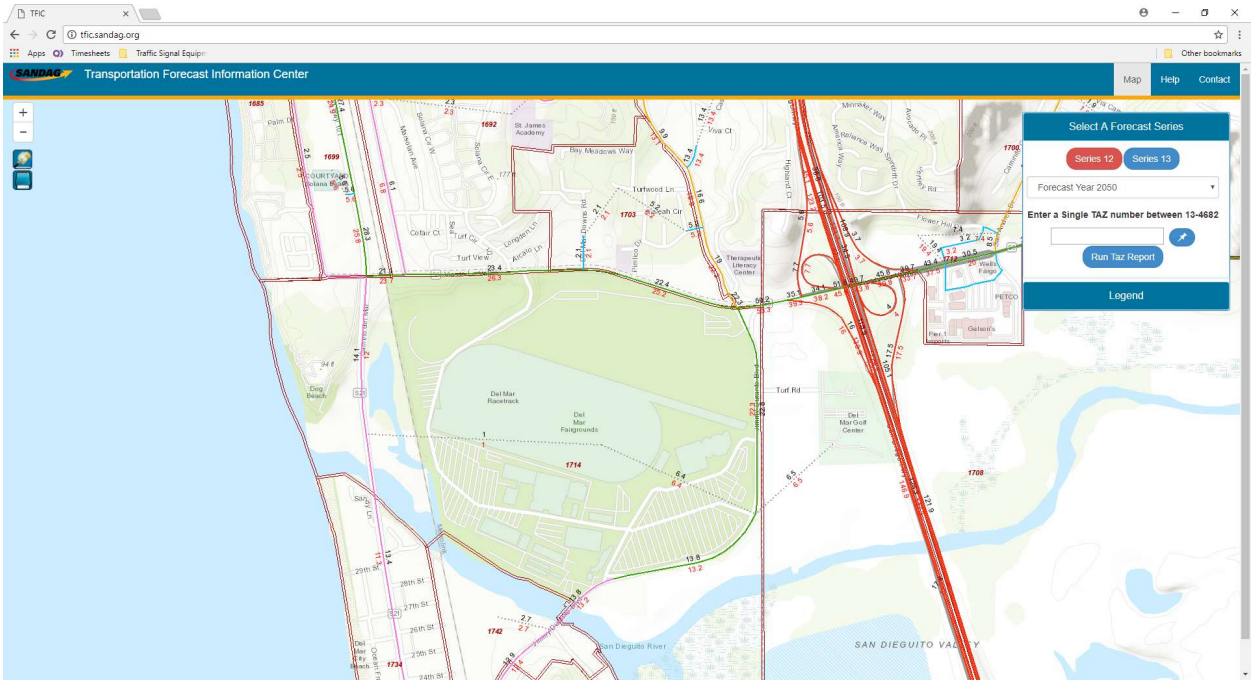
SANDAG Series 12 Model and Growth Calculation

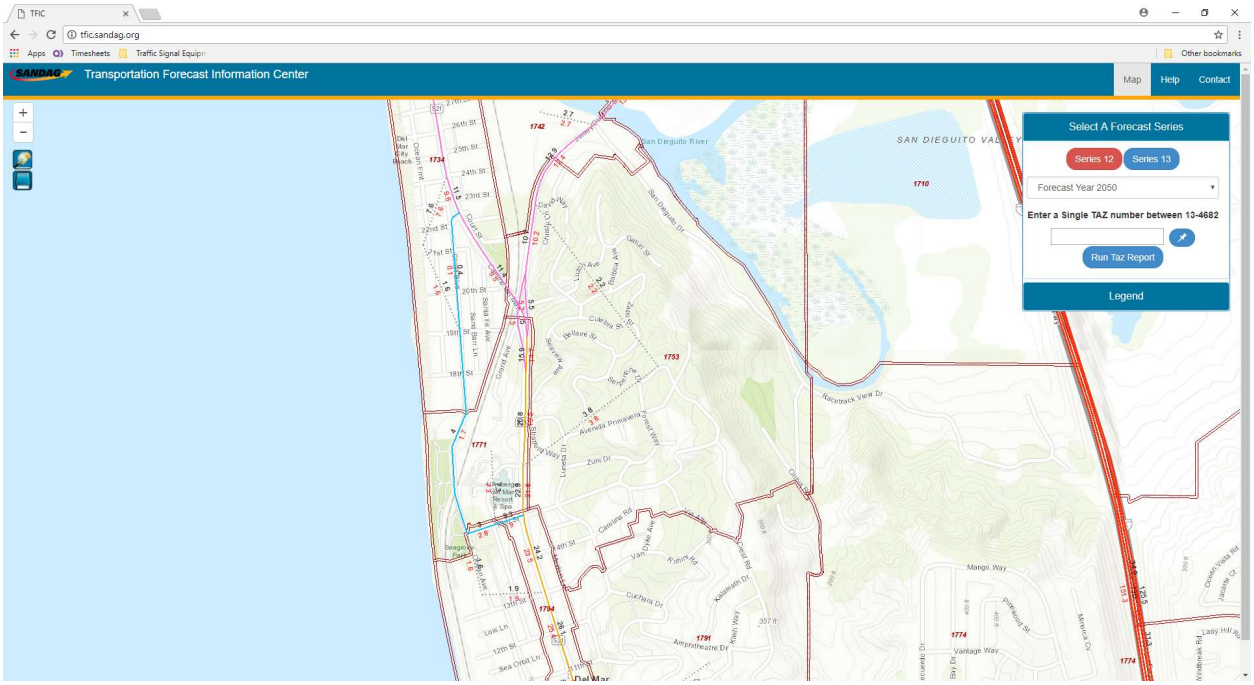
Series 12 Year 2008





Year 2050


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Forecast Year 2050
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Legend
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Series 13
Forecast Year 2050
Enter a Single TAZ number between 13-4682
Run Taz Report
Legend
SAN DIEGUITO VALLEY

Camino Del Mar Bridge Project Growth Factor Calculation

	SEG ID	Segments	2008 SANDAG Series 12 Model	2050 SANDAG Series 12 Model	Interpolated 2040 ADT
Camino Del Mar/Hwy 101	1	N/o Via De La Ville	25,600	28,300	27,657
	2	Via De La Ville - Coast Blvd	12,500	13,750	13,452
	3	Coast Blvd - Jimmi Durante Blvd	9,700	11,400	10,995
	4	Jimmi Durante Blvd - L'Auberge Del Mar	19,000	20,800	20,371
	5	L'Auberge Del Mar - 15th St	21,000	22,900	22,448
	6	S/o 15th St	20,800	24,200	23,390
Valley Ave	7	N/o Via De La Valle	17,200	22,300	21,086
Jimmi Durante Blvd	8	S/o Via De La Valle	20,200	22,800	22,181
	9	N/O San Dieguito Dr	13,100	13,800	13,633
	10	San Dieguito Dr to Camino Del Mar	11,500	11,800	11,729
Border Ave	11	W/o Camino Del Mar	900	2,500	2,119
Via De La Valle	12	Camino Del Mar to Jimmy Durante Blvd	18,300	22,300	21,348
	13	E/o Jimmy Durante Blvd	41,300	50,200	48,081
Coast Blvd	14	W/o Camino Del Mar	100	400	329
15th St	15	W/o Camino Del Mar	6100	9300	8,538

AM **#1** N/S Street: Highway 101 E/W Street: Via De La Valle AM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2035)		FUTURE Raw Turning Movement Volumes		FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**Via De La Valle**		**%**				**Northbound**		**N of**	**Via De La Valle**				
	Left	**11**	NB	313	28%	NB	594	**12**	Left	**350**	NB	350	12	**+12**	**+12**	**12**
14,580	Thru	**134**	SB	820	72%	SB	1556	**144**	Thru	**1556**	SB	1556	147	**+147**	**+147**	**147**
14580	Right	**118**	Sum	**1133**		**Enter**	**27660**	**127**	Right		Sum	**1905**	130	**+130**	**+130**	**130**
	Southbound	**S. of**	**Via De La Valle**						**Southbound**		**S of**	**Via De La Valle**				
	Left	**416**	NB	263	33%	NB	282	**789**	Left	**282**	NB	282	458	**+789**	**+460**	**460**
12,540	Thru	**391**	SB	546	67%	SB	586	**742**	Thru	**911**	SB	911	430	**+742**	**+450**	**450**
	Right	**13**	Sum	**809**		**Enter**	**13452**	**25**	Right		Sum	**1193**	14	**+25**	**+25**	**25**
	Eastbound	**E. of**	**Highway 101**						**Eastbound**		**E of**	**Highway 101**				
	Left	**2**	EB	672	62%	EB	776	**1**	Left	**1018**	EB	1018	2	**+2**	**+2**	**2**
18,498	Thru	**138**	WB	407	38%	WB	470	**102**	Thru	**470**	WB	470	152	**+152**	**+152**	**152**
	Right	**24**	Sum	**1079**		**Enter**	**21350**	**18**	Right		Sum	**1487**	26	**+26**	**+26**	**26**
	Westbound	**W.of**	**Highway 101**						**Westbound**		**W of**	**Highway 101**				
	Left	**131**	EB	164	57%	EB	121	**151**	Left	**121**	EB	121	144	**+151**	**+151**	**151**
2,870	Thru	**99**	WB	123	43%	WB	91	**114**	Thru	**151**	WB	151	109	**+114**	**+114**	**114**
2870	Right	**177**	Sum	**287**		**Enter**	**2120**	**204**	Right		Sum	**272**	195	**+204**	**+204**	**204**

PM N/S Street: Highway 101 E/W Street: Via De La Valle PM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2035)		FUTURE Raw Turning Movement Volumes		FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**Via De La Valle**		**%**				**Northbound**		**N of**	**Via De La Valle**				
	Left	**40**	NB	914	63%	NB	1734	**43**	Left	**1008**	NB	1008	44	**+44**	**+44**	**44**
14,580	Thru	**548**	SB	544	37%	SB	1032	**588**	Thru	**1032**	SB	1032	603	**+603**	**+603**	**603**
	Right	**129**	Sum	**1458**		**Enter**	**27660**	**138**	Right		Sum	**2040**	142	**+142**	**+142**	**142**
	Southbound	**S. of**	**Via De La Valle**						**Southbound**		**S of**	**Via De La Valle**				
	Left	**256**	NB	717	61%	NB	769	**486**	Left	**769**	NB	769	282	**+486**	**+350**	**350**
12,540	Thru	**277**	SB	454	39%	SB	487	**526**	Thru	**721**	SB	721	305	**+526**	**+400**	**400**
	Right	**11**	Sum	**1171**		**Enter**	**13452**	**21**	Right		Sum	**1490**	12	**+21**	**+21**	**21**
	Eastbound	**E. of**	**Highway 101**						**Eastbound**		**E of**	**Highway 101**				
	Left	**5**	EB	495	45%	EB	571	**4**	Left	**705**	EB	705	6	**+6**	**+6**	**6**
18,498	Thru	**110**	WB	609	55%	WB	703	**81**	Thru	**703**	WB	703	121	**+121**	**+121**	**121**
	Right	**21**	Sum	**1104**		**Enter**	**21350**	**16**	Right		Sum	**1408**	23	**+23**	**+23**	**23**
	Westbound	**W.of**	**Highway 101**						**Westbound**		**W of**	**Highway 101**				
	Left	**156**	EB	136	49%	EB	100	**180**	Left	**100**	EB	100	172	**+180**	**+180**	**180**
2,870	Thru	**92**	WB	143	51%	WB	106	**106**	Thru	**170**	WB	170	101	**+106**	**+106**	**106**
	Right	**361**	Sum	**279**		**Enter**	**2120**	**417**	Right		Sum	**270**	397	**+417**	**+417**	**417**

AM **#2** N/S Street: Camino Del Mar E/W Street: Court St AM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2035)		FUTURE Raw Turning Movement Volumes	FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**Court St**		**%**			**Northbound**		**N of**	**Court St**				
	Left	**9**	NB	195	28%	NB 195	**9**	Left	**188**	NB	188	10	**+10**	**+10**	**10**
13,450	Thru	**139**	SB	508	72%	SB 508	**139**	Thru	**508**	SB	508	153	**+153**	**+153**	**153**
	Right	**3**	Sum	**703**		**Enter**	**13450** **3**	Right		Sum	**696**	3	**+3**	**+3**	**3**
	Southbound	**S. of**	**Court St**					**Southbound**		**S of**	**Court St**				
	Left	**10**	NB	151	25%	NB 151	**10**	Left	**151**	NB	151	11	**+11**	**+11**	**11**
11,000	Thru	**434**	SB	457	75%	SB 457	**434**	Thru	**452**	SB	452	477	**+477**	**+477**	**477**
	Right	**64**	Sum	**608**		**Enter**	**11000** **64**	Right		Sum	**603**	70	**+70**	**+70**	**70**
	Eastbound	**E. of**	**Camino Del Mar**					**Eastbound**		**E of**	Camino Del Mar				
	Left	**49**	EB	14	54%	EB 0	**49**	Left	**14**	EB	14	54	**+54**	**+54**	**54**
260	Thru	**1**	WB	12	46%	WB 0	**1**	Thru	**0**	WB	0	1	**+1**	**+1**	**1**
260	Right	**18**	Sum	**26**		**Enter**	**18**	Right		Sum	**14**	20	**+20**	**+20**	**20**
	Westbound	**W.of**	**Camino Del Mar**					**Westbound**		**W of**	Camino Del Mar				
	Left	**5**	EB	68	48%	EB 68	**0**	Left	**68**	EB	68	6	**+6**	**+6**	**6**
330	Thru	**0**	WB	73	52%	WB 73	**0**	Thru	**73**	WB	73	0	**+0**	**+0**	**0**
	Right	**7**	Sum	**141**		**Enter**	**330** **0**	Right		Sum	**141**	8	**+8**	**+8**	**8**

PM N/S Street: Camino Del Mar E/W Street: Court St PM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2035)		FUTURE Raw Turning Movement Volumes	FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**Court St**		**%**			**Northbound**		**N of**	**Court St**				
	Left	**15**	NB	652	63%	NB 652	**15**	Left	**650**	NB	650	17	**+17**	**+17**	**17**
13,450	Thru	**548**	SB	381	37%	SB 381	**548**	Thru	**381**	SB	381	603	**+603**	**+603**	**603**
	Right	**2**	Sum	**1033**		**Enter**	**13450** **2**	Right		Sum	**1031**	2	**+2**	**+2**	**2**
	Southbound	**S. of**	**Court St**					**Southbound**		**S of**	**Court St**				
	Left	**7**	NB	565	66%	NB 565	**7**	Left	**565**	NB	565	8	**+8**	**+8**	**8**
11,000	Thru	**274**	SB	294	34%	SB 294	**274**	Thru	**290**	SB	290	301	**+301**	**+301**	**301**
	Right	**100**	Sum	**859**		**Enter**	**11000** **100**	Right		Sum	**855**	110	**+110**	**+110**	**110**
	Eastbound	**E. of**	**Camino Del Mar**					**Eastbound**		**E of**	Camino Del Mar				
	Left	**102**	EB	9	60%	EB 0	**102**	Left	**9**	EB	9	112	**+112**	**+112**	**112**
260	Thru	**0**	WB	6	40%	WB 0	**0**	Thru	**0**	WB	0	0	**+0**	**+0**	**0**
	Right	**16**	Sum	**15**		**Enter**	**0** **16**	Right		Sum	**9**	18	**+18**	**+18**	**18**
	Westbound	**W.of**	**Camino Del Mar**					**Westbound**		**W of**	Camino Del Mar				
	Left	**4**	EB	118	51%	EB 118	**0**	Left	**118**	EB	118	4	**+4**	**+4**	**4**
330	Thru	**0**	WB	115	49%	WB 115	**0**	Thru	**115**	WB	115	0	**+0**	**+0**	**0**
	Right	**2**	Sum	**233**		**Enter**	**330** **0**	Right		Sum	**233**	2	**+2**	**+2**	**2**

AM **#3** N/S Street: Camino Del Mar E/W Street: Plaza Parking AM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2035)		FUTURE Raw Turning Movement Volumes		FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**Plaza Parking**		**%**				**Northbound**		**N of**	**Plaza Parking**				
	Left	**14**	NB	405	36%	NB	479	**15**	Left	**401**	NB	401	15	**+15**	**+15**	**15**
17,224	Thru	**382**	SB	706	64%	SB	835	**401**	Thru	**835**	SB	835	420	**+420**	**+420**	**420**
	Right	**12**	Sum	**1111**		**Enter**	**20370**	**13**	Right		Sum	**1236**	13	**+13**	**+13**	**13**
	Southbound	**S. of**	**Plaza Parking**						**Southbound**		**S of**	**Plaza Parking**				
	Left	**42**	NB	408	38%	NB	428	**50**	Left	**428**	NB	428	46	**+50**	**+50**	**50**
21,389	Thru	**648**	SB	662	62%	SB	695	**766**	Thru	**766**	SB	766	713	**+766**	**+720**	**720**
from shores p	Right	**16**	Sum	**1070**		**Enter**	**22450**	**19**	Right		Sum	**1195**	18	**+19**	**+19**	**19**
	Eastbound	**E. of**	**Camino Del Mar**						**Eastbound**		**E of**	**Camino Del Mar**				
	Left	**18**	EB	55	0%	EB	0	**0**	Left	**62**	EB	62	20	**+20**	**+20**	**20**
1,050	Thru	**1**	WB	6	0%	WB	0	**0**	Thru	**0**	WB	0	1	**+1**	**+1**	**1**
1050	Right	**13**	Sum	**61**		**Enter**		**0**	Right		Sum	**62**	14	**+14**	**+14**	**14**
	Westbound	**W.of**	**Camino Del Mar**						**Westbound**		**W of**	**Camino Del Mar**				
	Left	**1**	EB	32	52%	EB	0	**0**	Left	**0**	EB	0	1	**+1**	**+1**	**1**
730	Thru	**0**	WB	30	48%	WB	0	**0**	Thru	**34**	WB	34	0	**+0**	**+0**	**0**
730	Right	**5**	Sum	**62**		**Enter**		**0**	Right		Sum	**34**	6	**+6**	**+6**	**6**

PM N/S Street: Camino Del Mar E/W Street: Plaza Parking PM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2035)		FUTURE Raw Turning Movement Volumes		FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**Plaza Parking**		**%**				**Northbound**		**N of**	**Plaza Parking**				
	Left	**13**	NB	1192	66%	NB	1410	**14**	Left	**1211**	NB	1211	14	**+14**	**+14**	**14**
17,224	Thru	**1154**	SB	624	34%	SB	738	**1211**	Thru	**738**	SB	738	1269	**+1,269**	**+1,269**	**1269**
	Right	**19**	Sum	**1816**		**Enter**	**20370**	**20**	Right		Sum	**1949**	21	**+21**	**+21**	**21**
	Southbound	**S. of**	**Plaza Parking**						**Southbound**		**S of**	**Plaza Parking**				
	Left	**53**	NB	1186	67%	NB	1245	**63**	Left	**1245**	NB	1245	58	**+63**	**+63**	**63**
21,389	Thru	**550**	SB	584	33%	SB	613	**650**	Thru	**650**	SB	650	605	**+650**	**+650**	**650**
	Right	**21**	Sum	**1770**		**Enter**	**22450**	**25**	Right		Sum	**1895**	23	**+25**	**+25**	**25**
	Eastbound	**E. of**	**Camino Del Mar**						**Eastbound**		**E of**	**Camino Del Mar**				
	Left	**22**	EB	72	0%	EB	0	**0**	Left	**83**	EB	83	24	**+24**	**+24**	**24**
1,050	Thru	**0**	WB	33	0%	WB	0	**0**	Thru	**0**	WB	0	0	**+0**	**+0**	**0**
	Right	**17**	Sum	**105**		**Enter**	**0**	**0**	Right		Sum	**83**	19	**+19**	**+19**	**19**
	Westbound	**W.of**	**Camino Del Mar**						**Westbound**		**W of**	**Camino Del Mar**				
	Left	**17**	EB	39	53%	EB	0	**0**	Left	**0**	EB	0	19	**+19**	**+19**	**19**
730	Thru	**0**	WB	34	47%	WB	0	**0**	Thru	**38**	WB	38	0	**+0**	**+0**	**0**
	Right	**16**	Sum	**73**		**Enter**	**0**	**0**	Right		Sum	**38**	18	**+18**	**+18**	**18**

AM **#4** N/S Street: Camino Del Mar E/W Street: 15th St AM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2035)		FUTURE Raw Turning Movement Volumes		FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**15th St**		**%**				**Northbound**		**N of**	**15th St**				
	Left	**68**	NB	380	35%	NB	495	**74**	Left	**407**	NB	407	75	**+75**	**+75**	**75**
17,224	Thru	**283**	SB	692	65%	SB	902	**310**	Thru	**902**	SB	902	311	**+311**	**+311**	**311**
	Right	**61**	Sum	**1072**		**Enter**	**22450**	**67**	Right		Sum	**1309**	67	**+67**	**+67**	**67**
	Southbound	**S. of**	**15th St**						**Southbound**		**S of**	**15th St**				
	Left	**102**	NB	412	39%	NB	451	**133**	Left	**451**	NB	451	112	**+133**	**+133**	**133**
21,389	Thru	**551**	SB	650	61%	SB	711	**718**	Thru	**899**	SB	899	606	**+718**	**+610**	**610**
from shores p	Right	**39**	Sum	**1062**		**Enter**	**23400**	**51**	Right		Sum	**1350**	43	**+51**	**+51**	**51**
	Eastbound	**E. of**	**Camino Del Mar**						**Eastbound**		**E of**	Camino Del Mar				
	Left	**36**	EB	171	63%	EB	0	**97**	Left	**221**	EB	221	40	**+97**	**+40**	**40**
3,220	Thru	**8**	WB	102	37%	WB	0	**22**	Thru	**0**	WB	0	9	**+22**	**+15**	**15**
3220	Right	**67**	Sum	**273**		**Enter**		**181**	Right		Sum	**221**	74	**+181**	**+80**	**80**
	Westbound	**W.of**	**Camino Del Mar**						**Westbound**		**W of**	Camino Del Mar				
	Left	**32**	EB	111	49%	EB	300	**0**	Left	**300**	EB	300	35	**+35**	**+35**	**35**
3,160	Thru	**9**	WB	116	51%	WB	313	**0**	Thru	**125**	WB	125	10	**+10**	**+10**	**10**
3160	Right	**61**	Sum	**227**		**Enter**	**8540**	**0**	Right		Sum	**425**	67	**+67**	**+67**	**67**

PM N/S Street: Camino Del Mar E/W Street: 15th St PM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2035)		FUTURE Raw Turning Movement Volumes		FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**15th St**		**%**				**Northbound**		**N of**	**15th St**				
	Left	**82**	NB	1165	66%	NB	1518	**90**	Left	**1234**	NB	1234	90	**+90**	**+90**	**90**
17,224	Thru	**995**	SB	608	34%	SB	792	**1089**	Thru	**792**	SB	792	1095	**+1,095**	**+1,095**	**1095**
	Right	**40**	Sum	**1773**		**Enter**	**22450**	**44**	Right		Sum	**2027**	44	**+44**	**+44**	**44**
	Southbound	**S. of**	**15th St**						**Southbound**		**S of**	**15th St**				
	Left	**94**	NB	1117	66%	NB	1222	**123**	Left	**1222**	NB	1222	103	**+123**	**+123**	**123**
21,389	Thru	**450**	SB	574	34%	SB	628	**587**	Thru	**814**	SB	814	495	**+587**	**+550**	**550**
	Right	**64**	Sum	**1691**		**Enter**	**23400**	**83**	Right		Sum	**2036**	70	**+83**	**+83**	**83**
	Eastbound	**E. of**	**Camino Del Mar**						**Eastbound**		**E of**	Camino Del Mar				
	Left	**54**	EB	144	45%	EB	0	**146**	Left	**193**	EB	193	59	**+146**	**+70**	**70**
3,220	Thru	**10**	WB	178	55%	WB	0	**27**	Thru	**0**	WB	0	11	**+27**	**+20**	**20**
	Right	**84**	Sum	**322**		**Enter**	**0**	**227**	Right		Sum	**193**	92	**+227**	**+110**	**110**
	Westbound	**W.of**	**Camino Del Mar**						**Westbound**		**W of**	Camino Del Mar				
	Left	**40**	EB	148	47%	EB	400	**0**	Left	**400**	EB	400	44	**+44**	**+44**	**44**
3,160	Thru	**22**	WB	168	53%	WB	454	**0**	Thru	**173**	WB	173	24	**+24**	**+24**	**24**
	Right	**116**	Sum	**316**		**Enter**	**8540**	**0**	Right		Sum	**573**	128	**+128**	**+128**	**128**

AM **#5** N/S Street: Valley Ave E/W Street: Via De La Valle AM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2040)		FUTURE Raw Turning Movement Volumes	FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**Via De La Valle**		**%**			**Northbound**		**N of**	**Via De La Valle**				
	Left	**24**	NB	471	40%	NB 837	**41**	Left	**702**	NB	702	26	**+41**	**+41**	**41**
11,880	Thru	**79**	SB	717	60%	SB 1273	**133**	Thru	**1273**	SB	1273	87	**+133**	**+133**	**133**
11880	Right	**239**	Sum	**1188**		**Enter**	**21100** **403**	Right		Sum	**1975**	263	**+403**	**+350**	**350**
	Southbound	**S. of**	**Via De La Valle**					**Southbound**		**S of**	**Via De La Valle**				
	Left	**526**	NB	342	39%	NB 577	**934**	Left	**577**	NB	577	579	**+934**	**+600**	**600**
13,141	Thru	**122**	SB	538	61%	SB 908	**217**	Thru	**824**	SB	824	134	**+217**	**+150**	**150**
	Right	**69**	Sum	**880**		**Enter**	**22180** **123**	Right		Sum	**1401**	76	**+123**	**+123**	**123**
	Eastbound	**E. of**	**Valley Ave**					**Eastbound**		**E of**	**Valley Ave**				
	Left	**53**	EB	1474	53%	EB 2205	**61**	Left	**2156**	EB	2156	58	**+61**	**+61**	**61**
32,160	Thru	**709**	WB	1313	47%	WB 1964	**818**	Thru	**1964**	WB	1964	780	**+818**	**+818**	**818**
32160	Right	**45**	Sum	**2787**		**Enter**	**48100** **52**	Right		Sum	**4120**	50	**+52**	**+52**	**52**
	Westbound	**W.of**	**Valley Ave**					**Westbound**		**W of**	**Valley Ave**				
	Left	**371**	EB	807	54%	EB 931	**555**	Left	**931**	EB	931	408	**+555**	**+430**	**430**
18,498	Thru	**603**	WB	696	46%	WB 803	**902**	Thru	**1065**	WB	1065	663	**+902**	**+750**	**750**
	Right	**339**	Sum	**1503**		**Enter**	**21350** **507**	Right		Sum	**1996**	373	**+507**	**+400**	**400**

PM N/S Street: Valley Ave E/W Street: Via De La Valle PM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2035)		FUTURE Raw Turning Movement Volumes	FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**Via De La Valle**		**%**			**Northbound**		**N of**	**Via De La Valle**				
	Left	**89**	NB	593	51%	NB 1053	**150**	Left	**907**	NB	907	98	**+150**	**+150**	**150**
11,880	Thru	**175**	SB	560	49%	SB 995	**295**	Thru	**995**	SB	995	193	**+295**	**+250**	**250**
	Right	**630**	Sum	**1153**		**Enter**	**21100** **1063**	Right		Sum	**1902**	693	**+1,063**	**+750**	**750**
	Southbound	**S. of**	**Via De La Valle**					**Southbound**		**S of**	**Via De La Valle**				
	Left	**358**	NB	894	51%	NB 1509	**636**	Left	**1509**	NB	1509	394	**+636**	**+450**	**450**
13,141	Thru	**136**	SB	859	49%	SB 1450	**242**	Thru	**1301**	SB	1301	150	**+242**	**+200**	**200**
	Right	**66**	Sum	**1753**		**Enter**	**22180** **117**	Right		Sum	**2810**	73	**+117**	**+117**	**117**
	Eastbound	**E. of**	**Valley Ave**					**Eastbound**		**E of**	**Valley Ave**				
	Left	**39**	EB	1493	46%	EB 2233	**45**	Left	**2282**	EB	2282	43	**+45**	**+45**	**45**
32,160	Thru	**505**	WB	1723	54%	WB 2577	**583**	Thru	**2577**	WB	2577	556	**+583**	**+583**	**583**
	Right	**64**	Sum	**3216**		**Enter**	**48100** **74**	Right		Sum	**4859**	70	**+74**	**+74**	**74**
	Westbound	**W.of**	**Valley Ave**					**Westbound**		**W of**	**Valley Ave**				
	Left	**659**	EB	608	42%	EB 702	**986**	Left	**702**	EB	702	725	**+986**	**+725**	**725**
18,498	Thru	**685**	WB	840	58%	WB 970	**1025**	Thru	**1292**	WB	1292	754	**+1,025**	**+800**	**800**
	Right	**379**	Sum	**1448**		**Enter**	**21350** **567**	Right		Sum	**1994**	417	**+567**	**+500**	**500**

AM **#6** N/S Street: Jimmy Durante Blvd E/W Street: San Dieguito Dr AM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2035)		FUTURE Raw Turning Movement Volumes		FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**San Dieguito Dr**		**%**				**Northbound**		**N of** San Dieguito Dr					
	Left	**4**	NB	284	40%	NB	295	**5**	Left	**317**	NB	317	4	**+5**	**+5**	**5**
13,141	Thru	**246**	SB	420	60%	SB	436	**317**	Thru	**436**	SB	436	271	**+317**	**+317**	**317**
	Right	**9**	Sum	**704**		**Enter**	**13630**	**12**	Right		Sum	**753**	10	**+12**	**+12**	**12**
	Southbound	**S. of**	**San Dieguito Dr**						**Southbound**		**S of** San Dieguito Dr					
	Left	**32**	NB	259	39%	NB	334	**33**	Left	**334**	NB	334	35	**+35**	**+35**	**35**
9,092	Thru	**382**	SB	398	61%	SB	513	**396**	Thru	**396**	SB	396	420	**+420**	**+420**	**420**
	Right	**6**	Sum	**657**		**Enter**	**11730**	**6**	Right		Sum	**730**	7	**+7**	**+7**	**7**
	Eastbound	**E. of**	**Jimmy Durante Blvd**						**Eastbound**		**E of** Jimmy Durante Blvd					
	Left	**5**	EB	43	48%	EB	0	**0**	Left	**45**	EB	45	6	**+6**	**+6**	**6**
1,160	Thru	**2**	WB	47	52%	WB	0	**0**	Thru	**0**	WB	0	2	**+2**	**+2**	**2**
1160	Right	**4**	Sum	**90**		**Enter**		**0**	Right		Sum	**45**	4	**+4**	**+4**	**4**
	Westbound	**W.of**	**Jimmy Durante Blvd**						**Westbound**		**W of** Jimmy Durante Blvd					
	Left	**12**	EB	11	48%	EB	0	**0**	Left	**0**	EB	0	13	**+13**	**+13**	**13**
210	Thru	**2**	WB	12	52%	WB	0	**0**	Thru	**11**	WB	11	2	**+2**	**+2**	**2**
210	Right	**33**	Sum	**23**		**Enter**		**0**	Right		Sum	**11**	36	**+36**	**+36**	**36**

PM N/S Street: Jimmy Durante Blvd E/W Street: San Dieguito Dr PM

Existing ADT	Existing	AM	Existing Link Volumes			Future ADT (2035)		FUTURE Raw Turning Movement Volumes		FUTURE Link Volumes	Verify		Minimum 10% Growth	PP or 10% Min Vol	Manually Adjusted	Final Volume
	Northbound	**N.of**	**San Dieguito Dr**		**%**				**Northbound**		**N of** San Dieguito Dr					
	Left	**3**	NB	716	70%	NB	743	**4**	Left	**850**	NB	850	3	**+4**	**+4**	**4**
13,141	Thru	**659**	SB	304	30%	SB	315	**850**	Thru	**315**	SB	315	725	**+850**	**+850**	**850**
	Right	**20**	Sum	**1020**		**Enter**	**13630**	**26**	Right		Sum	**1166**	22	**+26**	**+26**	**26**
	Southbound	**S. of**	**San Dieguito Dr**						**Southbound**		**S of** San Dieguito Dr					
	Left	**45**	NB	682	72%	NB	880	**47**	Left	**880**	NB	880	50	**+50**	**+50**	**50**
9,092	Thru	**256**	SB	263	28%	SB	339	**266**	Thru	**266**	SB	266	282	**+282**	**+282**	**282**
	Right	**3**	Sum	**945**		**Enter**	**11730**	**3**	Right		Sum	**1145**	3	**+3**	**+3**	**3**
	Eastbound	**E. of**	**Jimmy Durante Blvd**						**Eastbound**		**E of** Jimmy Durante Blvd					
	Left	**13**	EB	65	56%	EB	0	**0**	Left	**72**	EB	72	14	**+14**	**+14**	**14**
1,160	Thru	**0**	WB	51	44%	WB	0	**0**	Thru	**0**	WB	0	0	**+0**	**+0**	**0**
	Right	**1**	Sum	**116**		**Enter**	**0**	**0**	Right		Sum	**72**	1	**+1**	**+1**	**1**
	Westbound	**W.of**	**Jimmy Durante Blvd**						**Westbound**		**W of** Jimmy Durante Blvd					
	Left	**6**	EB	14	67%	EB	0	**0**	Left	**0**	EB	0	7	**+7**	**+7**	**7**
210	Thru	**1**	WB	7	33%	WB	0	**0**	Thru	**7**	WB	7	1	**+1**	**+1**	**1**
	Right	**44**	Sum	**21**		**Enter**	**0**	**0**	Right		Sum	**7**	48	**+48**	**+48**	**48**

Appendix D

Horizon Year 2040 HCM Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	2	152	26	151	114	204	5	10	147	130	15	470
Future Volume (vph)	2	152	26	151	114	204	5	10	147	130	15	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00	0.95	1.00		1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected		1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1826		1770	1863	1583		1770	3539	1583		1770
Flt Permitted		1.00		0.59	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1822		1106	1863	1583		1770	3539	1583		1770
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	165	28	164	124	222	5	11	160	141	16	511
RTOR Reduction (vph)	0	7	0	0	0	169	0	0	0	112	0	0
Lane Group Flow (vph)	0	188	0	164	124	53	0	16	160	29	0	527
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases		4			4		5	5	2		1	1
Permitted Phases	4			4		4				2		
Actuated Green, G (s)		16.7		16.7	16.7	16.7		1.3	14.3	14.3		22.2
Effective Green, g (s)		16.7		16.7	16.7	16.7		1.3	14.3	14.3		22.2
Actuated g/C Ratio		0.24		0.24	0.24	0.24		0.02	0.21	0.21		0.32
Clearance Time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0		3.0
Lane Grp Cap (vph)		437		265	447	379		33	727	325		564
v/s Ratio Prot					0.07			0.01	0.05			c0.30
v/s Ratio Perm		0.10		c0.15		0.03				0.02		
v/c Ratio		0.43		0.62	0.28	0.14		0.48	0.22	0.09		0.93
Uniform Delay, d1		22.4		23.6	21.5	20.8		33.8	23.0	22.4		23.0
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		0.7		4.3	0.3	0.2		10.8	0.2	0.1		22.8
Delay (s)		23.1		27.9	21.9	21.0		44.6	23.2	22.5		45.8
Level of Service		C		C	C	C		D	C	C		D
Approach Delay (s)		23.1			23.4				23.9			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	16.4
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	450	25
Future Volume (vph)	450	25
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.9	
Lane Util. Factor	0.95	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3511	
Flt Permitted	1.00	
Satd. Flow (perm)	3511	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	489	27
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	513	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	35.2	
Effective Green, g (s)	35.2	
Actuated g/C Ratio	0.51	
Clearance Time (s)	5.9	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1775	
v/s Ratio Prot	c0.15	
v/s Ratio Perm		
v/c Ratio	0.29	
Uniform Delay, d1	10.0	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	10.0	
Level of Service	B	
Approach Delay (s)	28.1	
Approach LOS	C	

Intersection Summary

Intersection	
Intersection Delay, s/veh	15.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	54	1	20	6	0	8	10	153	3	10	5	477
Future Vol, veh/h	54	1	20	6	0	8	10	153	3	10	5	477
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	59	1	22	7	0	9	11	166	3	11	5	518
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	1

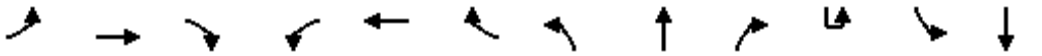
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	10.5	9.3	11.1	18
HCM LOS	B	A	B	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	72%	43%	100%	0%	0%
Vol Thru, %	0%	98%	1%	0%	0%	100%	0%
Vol Right, %	0%	2%	27%	57%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	156	75	14	15	477	70
LT Vol	10	0	54	6	15	0	0
Through Vol	0	153	1	0	0	477	0
RT Vol	0	3	20	8	0	0	70
Lane Flow Rate	11	170	82	15	16	518	76
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.02	0.283	0.148	0.027	0.025	0.724	0.091
Departure Headway (Hd)	6.533	6.016	6.537	6.44	5.528	5.026	4.322
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	544	592	544	559	645	716	824
Service Time	4.324	3.807	4.336	4.14	3.283	2.78	2.076
HCM Lane V/C Ratio	0.02	0.287	0.151	0.027	0.025	0.723	0.092
HCM Control Delay	9.5	11.2	10.5	9.3	8.4	19.9	7.5
HCM Lane LOS	A	B	B	A	A	C	A
HCM 95th-tile Q	0.1	1.2	0.5	0.1	0.1	6.3	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	70
Future Vol, veh/h	70
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	76
Number of Lanes	1

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	20	1	14	1	0	6	15	420	13	35	15	720
Future Volume (vph)	20	1	14	1	0	6	15	420	13	35	15	720
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6		4.0	5.3			4.6	5.3
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95			1.00	0.95
Frt		0.95		1.00	0.85		1.00	1.00			1.00	1.00
Flt Protected		0.97		0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)		1714		1770	1583		1770	3523			1770	3526
Flt Permitted		1.00		1.00	1.00		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1763		1863	1583		1770	3523			1770	3526
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	22	1	15	1	0	6	16	452	14	38	16	774
RTOR Reduction (vph)	0	14	0	0	6	0	0	2	0	0	0	1
Lane Group Flow (vph)	0	24	0	1	0	0	16	464	0	0	54	793
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8								
Actuated Green, G (s)		1.8		1.8	1.8		0.8	15.7			2.1	17.6
Effective Green, g (s)		1.8		1.8	1.8		0.8	15.7			2.1	17.6
Actuated g/C Ratio		0.05		0.05	0.05		0.02	0.46			0.06	0.52
Clearance Time (s)		4.6		4.6	4.6		4.0	5.3			4.6	5.3
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		93		98	83		41	1622			109	1819
v/s Ratio Prot					0.00		0.01	0.13			c0.03	c0.22
v/s Ratio Perm		c0.01		0.00								
v/c Ratio		0.26		0.01	0.00		0.39	0.29			0.50	0.44
Uniform Delay, d1		15.5		15.3	15.3		16.4	5.7			15.5	5.2
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		1.5		0.0	0.0		6.0	0.1			3.5	0.2
Delay (s)		17.0		15.3	15.3		22.5	5.8			19.0	5.3
Level of Service		B		B	B		C	A			B	A
Approach Delay (s)		17.0			15.3			6.4				6.2
Approach LOS		B			B			A				A

Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	34.1	Sum of lost time (s)	14.5
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	19
Future Volume (vph)	19
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	20
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	40	15	80	35	10	67	5	70	311	67	20	113
Future Volume (vph)	40	15	80	35	10	67	5	70	311	67	20	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	0.95			1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.97			1.00
Flt Protected		0.97	1.00	0.95	0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1798	1583	1681	1723	1583		1770	3445			1770
Flt Permitted		0.97	1.00	0.95	0.97	1.00		0.95	1.00			0.95
Satd. Flow (perm)		1798	1583	1681	1723	1583		1770	3445			1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	16	84	37	11	71	5	74	327	71	21	119
RTOR Reduction (vph)	0	0	76	0	0	65	0	0	11	0	0	0
Lane Group Flow (vph)	0	58	8	24	24	6	0	79	387	0	0	140
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases	7	7		8	8		5	5	2		1	1
Permitted Phases			7			8						
Actuated Green, G (s)		6.1	6.1	5.0	5.0	5.0		6.9	19.0			12.1
Effective Green, g (s)		6.1	6.1	5.0	5.0	5.0		6.9	19.0			12.1
Actuated g/C Ratio		0.10	0.10	0.08	0.08	0.08		0.11	0.31			0.20
Clearance Time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		179	158	137	141	129		200	1073			351
v/s Ratio Prot		c0.03		c0.01	0.01			0.04	0.11			c0.08
v/s Ratio Perm			0.01			0.00						
v/c Ratio		0.32	0.05	0.18	0.17	0.05		0.40	0.36			0.40
Uniform Delay, d1		25.5	24.8	26.1	26.1	25.8		25.1	16.3			21.3
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		1.1	0.1	0.6	0.6	0.1		1.3	0.2			0.7
Delay (s)		26.6	25.0	26.7	26.6	25.9		26.4	16.5			22.0
Level of Service		C	C	C	C	C		C	B			C
Approach Delay (s)		25.6			26.2				18.1			
Approach LOS		C			C				B			

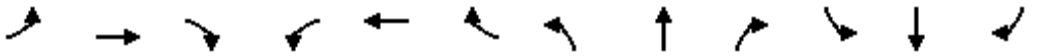
Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	610	51
Future Volume (vph)	610	51
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3498	
Flt Permitted	1.00	
Satd. Flow (perm)	3498	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	642	54
RTOR Reduction (vph)	4	0
Lane Group Flow (vph)	692	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	24.5	
Effective Green, g (s)	24.5	
Actuated g/C Ratio	0.40	
Clearance Time (s)	5.3	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1404	
v/s Ratio Prot	c0.20	
v/s Ratio Perm		
v/c Ratio	0.49	
Uniform Delay, d1	13.6	
Progression Factor	1.00	
Incremental Delay, d2	0.3	
Delay (s)	13.9	
Level of Service	B	
Approach Delay (s)	15.3	
Approach LOS	B	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	818	52	430	750	400	41	133	350	600	150	123
Future Volume (vph)	61	818	52	430	750	400	41	133	350	600	150	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	0.88	0.97	1.00	1.00
Frt	1.00	0.99		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3508		3433	3354		1770	1863	2787	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3508		3433	3354		1770	1863	2787	3433	1863	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	64	852	54	448	781	417	43	139	365	625	156	128
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	319	0	0	97
Lane Group Flow (vph)	64	904	0	448	1198	0	43	139	46	625	156	31
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases									2			1
Actuated Green, G (s)	8.4	32.5		21.3	45.5		15.5	15.5	15.5	29.8	29.8	29.8
Effective Green, g (s)	8.4	32.5		21.3	45.5		15.5	15.5	15.5	29.8	29.8	29.8
Actuated g/C Ratio	0.07	0.27		0.17	0.37		0.13	0.13	0.13	0.24	0.24	0.24
Clearance Time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	121	929		596	1244		223	235	352	834	452	384
v/s Ratio Prot	0.04	0.26		c0.13	c0.36		0.02	c0.07		c0.18	0.08	
v/s Ratio Perm									0.02			0.02
v/c Ratio	0.53	0.97		0.75	0.96		0.19	0.59	0.13	0.75	0.35	0.08
Uniform Delay, d1	55.2	44.6		48.1	37.7		47.9	50.6	47.6	42.9	38.3	35.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	23.0		5.3	17.3		0.4	4.0	0.2	3.7	0.5	0.1
Delay (s)	59.3	67.6		53.5	55.0		48.4	54.5	47.7	46.7	38.8	35.9
Level of Service	E	E		D	E		D	D	D	D	D	D
Approach Delay (s)		67.0			54.6			49.5			43.8	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	54.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	122.6	Sum of lost time (s)	23.5
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	12	55	359	498
Demand Flow Rate, veh/h	12	56	366	508
Vehicles Circulating, veh/h	514	359	47	21
Vehicles Exiting, veh/h	15	54	479	394
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.5	5.4	6.8	8.4
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	12	56	366	508
Cap Entry Lane, veh/h	676	789	1078	1106
Entry HV Adj Factor	0.997	0.981	0.981	0.980
Flow Entry, veh/h	12	55	359	498
Cap Entry, veh/h	674	774	1058	1085
V/C Ratio	0.018	0.071	0.339	0.459
Control Delay, s/veh	5.5	5.4	6.8	8.4
LOS	A	A	A	A
95th %tile Queue, veh	0	0	2	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	6	121	23	180	106	417	10	40	603	142	20	350
Future Volume (vph)	6	121	23	180	106	417	10	40	603	142	20	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00	0.95	1.00		1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected		1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1821		1770	1863	1583		1770	3539	1583		1770
Flt Permitted		0.99		0.62	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1805		1158	1863	1583		1770	3539	1583		1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	6	127	24	189	112	439	11	42	635	149	21	368
RTOR Reduction (vph)	0	7	0	0	0	336	0	0	0	99	0	0
Lane Group Flow (vph)	0	150	0	189	112	103	0	53	635	50	0	389
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases		4			4		5	5	2		1	1
Permitted Phases	4			4		4				2		
Actuated Green, G (s)		19.8		19.8	19.8	19.8		5.0	24.4	24.4		24.1
Effective Green, g (s)		19.8		19.8	19.8	19.8		5.0	24.4	24.4		24.1
Actuated g/C Ratio		0.23		0.23	0.23	0.23		0.06	0.29	0.29		0.28
Clearance Time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0		3.0
Lane Grp Cap (vph)		421		270	435	370		104	1019	456		503
v/s Ratio Prot					0.06			0.03	c0.18			c0.22
v/s Ratio Perm		0.08		c0.16		0.06				0.03		
v/c Ratio		0.36		0.70	0.26	0.28		0.51	0.62	0.11		0.77
Uniform Delay, d1		27.1		29.7	26.5	26.6		38.7	26.2	22.2		27.8
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		0.5		7.7	0.3	0.4		3.9	1.2	0.1		7.3
Delay (s)		27.6		37.4	26.8	27.0		42.5	27.4	22.3		35.1
Level of Service		C		D	C	C		D	C	C		D
Approach Delay (s)		27.6			29.6				27.4			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	84.7	Sum of lost time (s)	16.4
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	400	21
Future Volume (vph)	400	21
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.9	
Lane Util. Factor	0.95	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3513	
Flt Permitted	1.00	
Satd. Flow (perm)	3513	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	421	22
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	440	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	43.5	
Effective Green, g (s)	43.5	
Actuated g/C Ratio	0.51	
Clearance Time (s)	5.9	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1804	
v/s Ratio Prot	0.13	
v/s Ratio Perm		
v/c Ratio	0.24	
Uniform Delay, d1	11.5	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	11.5	
Level of Service	B	
Approach Delay (s)	22.5	
Approach LOS	C	

Intersection Summary

Intersection	
Intersection Delay, s/veh	56.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Vol, veh/h	112	0	18	4	0	2	5	15	603	2	5	5
Future Vol, veh/h	112	0	18	4	0	2	5	15	603	2	5	5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	120	0	19	4	0	2	5	16	648	2	5	5
Number of Lanes	0	1	0	0	1	0	0	1	1	0	0	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	13.7	10.9	95.6	13.4
HCM LOS	B	B	F	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	86%	67%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	0%	100%	0%
Vol Right, %	0%	0%	14%	33%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	605	130	6	10	301	110
LT Vol	20	0	112	4	10	0	0
Through Vol	0	603	0	0	0	301	0
RT Vol	0	2	18	2	0	0	110
Lane Flow Rate	22	651	140	6	11	324	118
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.04	1.121	0.291	0.014	0.019	0.522	0.167
Departure Headway (Hd)	6.714	6.206	7.791	8.099	6.528	6.02	5.308
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	537	592	464	445	552	602	680
Service Time	4.414	3.906	5.491	5.799	4.228	3.72	3.008
HCM Lane V/C Ratio	0.041	1.1	0.302	0.013	0.02	0.538	0.174
HCM Control Delay	9.7	98.4	13.7	10.9	9.4	15.1	9.1
HCM Lane LOS	A	F	B	B	A	C	A
HCM 95th-tile Q	0.1	20.6	1.2	0	0.1	3	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBT	SBR
Lane Configurations		
Traffic Vol, veh/h	301	110
Future Vol, veh/h	301	110
Peak Hour Factor	0.93	0.93
Heavy Vehicles, %	2	2
Mvmt Flow	324	118
Number of Lanes	1	1

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	24	0	19	19	0	18	5	15	1269	21	35	28
Future Volume (vph)	24	0	19	19	0	18	5	15	1269	21	35	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6			4.0	5.3			4.6
Lane Util. Factor		1.00		1.00	1.00			1.00	0.95			1.00
Frt		0.94		1.00	0.85			1.00	1.00			1.00
Flt Protected		0.97		0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)		1703		1770	1583			1770	3531			1770
Flt Permitted		0.82		0.91	1.00			0.95	1.00			0.95
Satd. Flow (perm)		1430		1693	1583			1770	3531			1770
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	0	21	21	0	20	5	16	1379	23	38	30
RTOR Reduction (vph)	0	44	0	0	19	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	3	0	21	1	0	0	21	1401	0	0	68
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8								
Actuated Green, G (s)		4.4		4.4	4.4			1.5	34.2			6.9
Effective Green, g (s)		4.4		4.4	4.4			1.5	34.2			6.9
Actuated g/C Ratio		0.07		0.07	0.07			0.02	0.57			0.12
Clearance Time (s)		4.6		4.6	4.6			4.0	5.3			4.6
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0			3.0
Lane Grp Cap (vph)		104		124	116			44	2012			203
v/s Ratio Prot					0.00			0.01	c0.40			c0.04
v/s Ratio Perm		0.00		c0.01								
v/c Ratio		0.03		0.17	0.01			0.48	0.70			0.33
Uniform Delay, d1		25.8		26.1	25.8			28.9	9.2			24.4
Progression Factor		1.00		1.00	1.00			0.89	2.08			1.00
Incremental Delay, d2		0.1		0.6	0.0			6.7	1.7			1.0
Delay (s)		26.0		26.7	25.8			32.3	20.8			25.4
Level of Service		C		C	C			C	C			C
Approach Delay (s)		26.0			26.3				21.0			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	650	25
Future Volume (vph)	650	25
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3520	
Flt Permitted	1.00	
Satd. Flow (perm)	3520	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	707	27
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	732	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	40.2	
Effective Green, g (s)	40.2	
Actuated g/C Ratio	0.67	
Clearance Time (s)	5.3	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2358	
v/s Ratio Prot	0.21	
v/s Ratio Perm		
v/c Ratio	0.31	
Uniform Delay, d1	4.1	
Progression Factor	1.00	
Incremental Delay, d2	0.3	
Delay (s)	4.5	
Level of Service	A	
Approach Delay (s)	6.2	
Approach LOS	A	

Intersection Summary

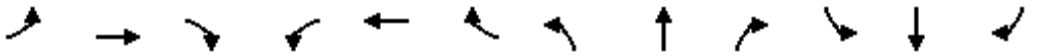
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	70	20	110	44	24	128	5	85	1095	44	15	108
Future Volume (vph)	70	20	110	44	24	128	5	85	1095	44	15	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	0.95			1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.99			1.00
Flt Protected		0.96	1.00	0.95	0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1793	1583	1681	1743	1583		1770	3519			1770
Flt Permitted		0.96	1.00	0.95	0.98	1.00		0.95	1.00			0.95
Satd. Flow (perm)		1793	1583	1681	1743	1583		1770	3519			1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	21	116	46	25	135	5	89	1153	46	16	114
RTOR Reduction (vph)	0	0	105	0	0	126	0	0	1	0	0	0
Lane Group Flow (vph)	0	95	11	35	36	9	0	94	1198	0	0	130
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases	7	7		8	8		5	5	2		1	1
Permitted Phases			7			8						
Actuated Green, G (s)		11.7	11.7	8.0	8.0	8.0		15.7	67.5			14.0
Effective Green, g (s)		11.7	11.7	8.0	8.0	8.0		15.7	67.5			14.0
Actuated g/C Ratio		0.10	0.10	0.07	0.07	0.07		0.13	0.56			0.12
Clearance Time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		174	154	112	116	105		231	1979			206
v/s Ratio Prot		c0.05		c0.02	0.02			0.05	c0.34			c0.07
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.55	0.07	0.31	0.31	0.09		0.41	0.61			0.63
Uniform Delay, d1		51.6	49.2	53.4	53.4	52.6		47.9	17.4			50.5
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.04
Incremental Delay, d2		3.5	0.2	1.6	1.5	0.4		1.2	1.4			6.1
Delay (s)		55.1	49.4	55.0	54.9	52.9		49.0	18.8			58.6
Level of Service		E	D	D	D	D		D	B			E
Approach Delay (s)		52.0			53.6				21.0			
Approach LOS		D			D				C			

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	550	83
Future Volume (vph)	550	83
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frt	0.98	
Flt Protected	1.00	
Satd. Flow (prot)	3470	
Flt Permitted	1.00	
Satd. Flow (perm)	3470	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	579	87
RTOR Reduction (vph)	6	0
Lane Group Flow (vph)	660	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	66.1	
Effective Green, g (s)	66.1	
Actuated g/C Ratio	0.55	
Clearance Time (s)	5.3	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1911	
v/s Ratio Prot	0.19	
v/s Ratio Perm		
v/c Ratio	0.35	
Uniform Delay, d1	14.9	
Progression Factor	1.11	
Incremental Delay, d2	0.5	
Delay (s)	17.0	
Level of Service	B	
Approach Delay (s)	23.8	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	585	75	725	800	500	150	250	750	450	200	117
Future Volume (vph)	45	585	75	725	800	500	150	250	750	450	200	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	0.88	0.97	1.00	1.00
Frt	1.00	0.98		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3479		3433	3335		1770	1863	2787	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3479		3433	3335		1770	1863	2787	3433	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	48	622	80	771	851	532	160	266	798	479	213	124
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	576	0	0	102
Lane Group Flow (vph)	48	696	0	771	1383	0	160	266	222	479	213	22
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases									2			1
Actuated Green, G (s)	4.9	37.3		38.5	71.0		28.5	28.5	28.5	27.5	27.5	27.5
Effective Green, g (s)	4.9	37.3		38.5	71.0		28.5	28.5	28.5	27.5	27.5	27.5
Actuated g/C Ratio	0.03	0.24		0.25	0.46		0.18	0.18	0.18	0.18	0.18	0.18
Clearance Time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	55	835		851	1524		324	341	511	607	329	280
v/s Ratio Prot	0.03	0.20		c0.22	c0.41		0.09	c0.14		c0.14	0.11	
v/s Ratio Perm									0.08			0.01
v/c Ratio	0.87	0.83		0.91	0.91		0.49	0.78	0.43	0.79	0.65	0.08
Uniform Delay, d1	74.9	56.0		56.6	39.1		56.9	60.4	56.2	61.1	59.4	53.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	76.2	7.2		13.1	8.1		1.2	11.0	0.6	6.8	4.3	0.1
Delay (s)	151.1	63.2		69.7	47.2		58.1	71.4	56.8	67.9	63.7	53.4
Level of Service	F	E		E	D		E	E	E	E	E	D
Approach Delay (s)		68.8			55.3			60.2			64.6	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	60.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	155.3	Sum of lost time (s)	23.5
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	20.2
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	15	57	907	346
Demand Flow Rate, veh/h	15	58	926	353
Vehicles Circulating, veh/h	357	912	67	12
Vehicles Exiting, veh/h	8	81	305	958
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.7	9.9	26.3	6.4
Approach LOS	A	A	D	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	15	58	926	353
Cap Entry Lane, veh/h	791	454	1057	1116
Entry HV Adj Factor	1.000	0.982	0.980	0.981
Flow Entry, veh/h	15	57	907	346
Cap Entry, veh/h	791	446	1036	1095
V/C Ratio	0.019	0.128	0.876	0.316
Control Delay, s/veh	4.7	9.9	26.3	6.4
LOS	A	A	D	A
95th %tile Queue, veh	0	0	12	1

Appendix E

Staged Construction (No Closure) Scenario HCM Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	2	138	24	66	99	177	4	7	134	118	11	483
Future Volume (vph)	2	138	24	66	99	177	4	7	134	118	11	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00	0.95	1.00		1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected		1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1825		1770	1863	1583		1770	3539	1583		1770
Flt Permitted		1.00		0.61	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1820		1145	1863	1583		1770	3539	1583		1770
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	150	26	72	108	192	4	8	146	128	12	525
RTOR Reduction (vph)	0	7	0	0	0	156	0	0	0	100	0	0
Lane Group Flow (vph)	0	171	0	72	108	36	0	12	146	28	0	537
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases		4			4		5	5	2		1	1
Permitted Phases	4			4		4				2		
Actuated Green, G (s)		12.2		12.2	12.2	12.2		1.3	13.9	13.9		22.1
Effective Green, g (s)		12.2		12.2	12.2	12.2		1.3	13.9	13.9		22.1
Actuated g/C Ratio		0.19		0.19	0.19	0.19		0.02	0.22	0.22		0.34
Clearance Time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0		3.0
Lane Grp Cap (vph)		343		216	351	298		35	761	340		605
v/s Ratio Prot					0.06			0.01	0.04			c0.30
v/s Ratio Perm		c0.09		0.06		0.02				0.02		
v/c Ratio		0.50		0.33	0.31	0.12		0.34	0.19	0.08		0.89
Uniform Delay, d1		23.5		22.7	22.6	21.8		31.2	20.8	20.2		20.1
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		1.1		0.9	0.5	0.2		5.8	0.1	0.1		14.7
Delay (s)		24.6		23.6	23.1	21.9		37.0	20.9	20.4		34.8
Level of Service		C		C	C	C		D	C	C		C
Approach Delay (s)		24.6			22.6				21.3			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	64.6	Sum of lost time (s)	16.4
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	313	13
Future Volume (vph)	313	13
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.9	
Lane Util. Factor	0.95	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3518	
Flt Permitted	1.00	
Satd. Flow (perm)	3518	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	340	14
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	352	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	34.7	
Effective Green, g (s)	34.7	
Actuated g/C Ratio	0.54	
Clearance Time (s)	5.9	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1889	
v/s Ratio Prot	c0.10	
v/s Ratio Perm		
v/c Ratio	0.19	
Uniform Delay, d1	7.7	
Progression Factor	1.00	
Incremental Delay, d2	0.0	
Delay (s)	7.7	
Level of Service	A	
Approach Delay (s)	24.0	
Approach LOS	C	

Intersection Summary

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	49	1	18	5	0	7	9	139	3	7	3	291
Future Vol, veh/h	49	1	18	5	0	7	9	139	3	7	3	291
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	53	1	20	5	0	8	10	151	3	8	3	316
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	1

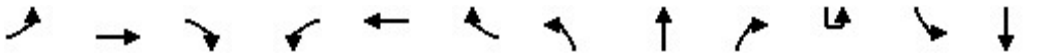
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	9.6	8.6	9.9	10.7
HCM LOS	A	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	72%	42%	100%	0%	0%
Vol Thru, %	0%	98%	1%	0%	0%	100%	0%
Vol Right, %	0%	2%	26%	58%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	142	68	12	10	291	64
LT Vol	9	0	49	5	10	0	0
Through Vol	0	139	1	0	0	291	0
RT Vol	0	3	18	7	0	0	64
Lane Flow Rate	10	154	74	13	11	316	70
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.017	0.238	0.123	0.021	0.016	0.435	0.082
Departure Headway (Hd)	6.073	5.556	6.015	5.744	5.452	4.949	4.246
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	588	645	594	620	657	728	842
Service Time	3.822	3.305	3.773	3.511	3.183	2.681	1.978
HCM Lane V/C Ratio	0.017	0.239	0.125	0.021	0.017	0.434	0.083
HCM Control Delay	8.9	10	9.6	8.6	8.3	11.5	7.4
HCM Lane LOS	A	A	A	A	A	B	A
HCM 95th-tile Q	0.1	0.9	0.4	0.1	0	2.2	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	64
Future Vol, veh/h	64
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	70
Number of Lanes	1

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	18	1	13	1	0	5	14	382	12	29	13	570
Future Volume (vph)	18	1	13	1	0	5	14	382	12	29	13	570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6		4.0	5.3			4.6	5.3
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95			1.00	0.95
Frt		0.94		1.00	0.85		1.00	1.00			1.00	1.00
Flt Protected		0.97		0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)		1711		1770	1583		1770	3523			1770	3525
Flt Permitted		1.00		1.00	1.00		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1759		1863	1583		1770	3523			1770	3525
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	19	1	14	1	0	5	15	411	13	31	14	613
RTOR Reduction (vph)	0	14	0	0	5	0	0	2	0	0	0	1
Lane Group Flow (vph)	0	20	0	1	0	0	15	422	0	0	45	629
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8								
Actuated Green, G (s)		0.8		0.8	0.8		0.7	13.5			2.1	15.5
Effective Green, g (s)		0.8		0.8	0.8		0.7	13.5			2.1	15.5
Actuated g/C Ratio		0.03		0.03	0.03		0.02	0.44			0.07	0.50
Clearance Time (s)		4.6		4.6	4.6		4.0	5.3			4.6	5.3
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		45		48	40		40	1539			120	1768
v/s Ratio Prot					0.00		0.01	0.12			c0.03	c0.18
v/s Ratio Perm		c0.01		0.00								
v/c Ratio		0.45		0.02	0.00		0.38	0.27			0.38	0.36
Uniform Delay, d1		14.8		14.7	14.7		14.9	5.6			13.8	4.7
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		7.1		0.2	0.0		5.8	0.1			2.0	0.1
Delay (s)		21.9		14.8	14.7		20.7	5.7			15.7	4.8
Level of Service		C		B	B		C	A			B	A
Approach Delay (s)		21.9			14.7			6.2				5.5
Approach LOS		C			B			A				A

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	30.9	Sum of lost time (s)	14.5
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	16
Future Volume (vph)	16
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	17
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

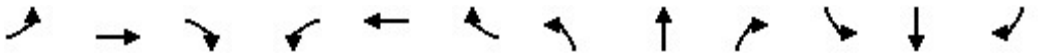
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	36	8	67	32	9	61	68	283	61	16	86	473
Future Volume (vph)	36	8	67	32	9	61	68	283	61	16	86	473
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	4.6	4.6	4.6	4.0	5.0			4.6	5.3
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95			1.00	0.95
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97			1.00	0.99
Flt Protected		0.96	1.00	0.95	0.97	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)		1789	1583	1681	1719	1583	1770	3445			1770	3499
Flt Permitted		0.96	1.00	0.95	0.97	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)		1789	1583	1681	1719	1583	1770	3445			1770	3499
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	38	8	71	34	9	64	72	298	64	17	91	498
RTOR Reduction (vph)	0	0	64	0	0	58	0	10	0	0	0	3
Lane Group Flow (vph)	0	46	7	21	22	6	72	352	0	0	108	536
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	Prot	NA
Protected Phases	7	7		8	8		5	2		1	1	6
Permitted Phases			7			8						
Actuated Green, G (s)		5.7	5.7	4.9	4.9	4.9	6.5	19.6			7.5	20.9
Effective Green, g (s)		5.7	5.7	4.9	4.9	4.9	6.5	19.6			7.5	20.9
Actuated g/C Ratio		0.10	0.10	0.09	0.09	0.09	0.12	0.35			0.13	0.37
Clearance Time (s)		4.6	4.6	4.6	4.6	4.6	4.0	5.0			4.6	5.3
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		180	159	145	149	137	203	1195			234	1294
v/s Ratio Prot		c0.03		0.01	c0.01		0.04	0.10			c0.06	c0.15
v/s Ratio Perm			0.00			0.00						
v/c Ratio		0.26	0.05	0.14	0.15	0.04	0.35	0.29			0.46	0.41
Uniform Delay, d1		23.4	22.9	23.9	23.9	23.6	23.1	13.4			22.6	13.2
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		0.8	0.1	0.5	0.5	0.1	1.1	0.1			1.4	0.2
Delay (s)		24.2	23.1	24.3	24.3	23.8	24.1	13.6			24.1	13.5
Level of Service		C	C	C	C	C	C	B			C	B
Approach Delay (s)		23.5			24.0			15.3				15.2
Approach LOS		C			C			B				B

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	56.5	Sum of lost time (s)	20.8
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	39
Future Volume (vph)	39
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	41
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	787	71	410	564	339	24	79	239	526	122	69
Future Volume (vph)	53	787	71	410	564	339	24	79	239	526	122	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	0.88	0.97	1.00	1.00
Frt	1.00	0.99		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3495		3433	3340		1770	1863	2787	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3495		3433	3340		1770	1863	2787	3433	1863	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	55	820	74	427	588	353	25	82	249	548	127	72
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	225	0	0	56
Lane Group Flow (vph)	55	890	0	427	941	0	25	82	24	548	127	16
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases									2			1
Actuated Green, G (s)	7.6	32.6		19.5	44.6		10.7	10.7	10.7	25.2	25.2	25.2
Effective Green, g (s)	7.6	32.6		19.5	44.6		10.7	10.7	10.7	25.2	25.2	25.2
Actuated g/C Ratio	0.07	0.29		0.17	0.40		0.10	0.10	0.10	0.23	0.23	0.23
Clearance Time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	120	1021		600	1336		169	178	267	775	421	357
v/s Ratio Prot	0.03	c0.25		c0.12	c0.28		0.01	c0.04		c0.16	0.07	
v/s Ratio Perm									0.01			0.01
v/c Ratio	0.46	0.87		0.71	0.70		0.15	0.46	0.09	0.71	0.30	0.05
Uniform Delay, d1	50.0	37.5		43.4	27.9		46.2	47.7	46.0	39.8	35.8	33.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.8	8.3		4.0	1.7		0.4	1.9	0.1	3.0	0.4	0.1
Delay (s)	52.7	45.8		47.3	29.7		46.6	49.6	46.1	42.7	36.2	33.8
Level of Service	D	D		D	C		D	D	D	D	D	C
Approach Delay (s)		46.2			35.2			46.9			40.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	111.5	Sum of lost time (s)	23.5
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	11	50	279	521
Demand Flow Rate, veh/h	11	51	284	532
Vehicles Circulating, veh/h	539	279	42	19
Vehicles Exiting, veh/h	12	47	508	311
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.7	4.9	5.9	8.7
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	11	51	284	532
Cap Entry Lane, veh/h	659	855	1083	1109
Entry HV Adj Factor	0.996	0.980	0.981	0.980
Flow Entry, veh/h	11	50	279	521
Cap Entry, veh/h	657	837	1063	1087
V/C Ratio	0.017	0.060	0.262	0.480
Control Delay, s/veh	5.7	4.9	5.9	8.7
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	5	110	21	78	92	388	6	34	384	129	16	295
Future Volume (vph)	5	110	21	78	92	388	6	34	384	129	16	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00	0.95	1.00		1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected		1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1821		1770	1863	1583		1770	3539	1583		1770
Flt Permitted		0.99		0.70	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1803		1304	1863	1583		1770	3539	1583		1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	116	22	82	97	408	6	36	404	136	17	311
RTOR Reduction (vph)	0	7	0	0	0	331	0	0	0	102	0	0
Lane Group Flow (vph)	0	136	0	82	97	77	0	42	404	34	0	328
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases		4			4		5	5	2		1	1
Permitted Phases	4			4		4				2		
Actuated Green, G (s)		12.5		12.5	12.5	12.5		4.5	16.6	16.6		20.7
Effective Green, g (s)		12.5		12.5	12.5	12.5		4.5	16.6	16.6		20.7
Actuated g/C Ratio		0.19		0.19	0.19	0.19		0.07	0.25	0.25		0.31
Clearance Time (s)		5.9		5.9	5.9	5.9		4.6	5.9	5.9		4.6
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0		3.0
Lane Grp Cap (vph)		340		246	351	298		120	887	396		553
v/s Ratio Prot					0.05			0.02	c0.11			c0.19
v/s Ratio Perm		c0.08		0.06		0.05				0.02		
v/c Ratio		0.40		0.33	0.28	0.26		0.35	0.46	0.09		0.59
Uniform Delay, d1		23.6		23.2	23.0	22.9		29.5	21.0	19.0		19.2
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		0.8		0.8	0.4	0.5		1.8	0.4	0.1		1.7
Delay (s)		24.3		24.0	23.4	23.4		31.2	21.3	19.1		20.9
Level of Service		C		C	C	C		C	C	B		C
Approach Delay (s)		24.3			23.5				21.5			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	66.2	Sum of lost time (s)	16.4
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	222	11
Future Volume (vph)	222	11
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.9	
Lane Util. Factor	0.95	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3513	
Flt Permitted	1.00	
Satd. Flow (perm)	3513	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	234	12
RTOR Reduction (vph)	4	0
Lane Group Flow (vph)	242	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	32.8	
Effective Green, g (s)	32.8	
Actuated g/C Ratio	0.50	
Clearance Time (s)	5.9	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1740	
v/s Ratio Prot	0.07	
v/s Ratio Perm		
v/c Ratio	0.14	
Uniform Delay, d1	9.1	
Progression Factor	1.00	
Incremental Delay, d2	0.0	
Delay (s)	9.1	
Level of Service	A	
Approach Delay (s)	15.8	
Approach LOS	B	

Intersection Summary

Intersection	
Intersection Delay, s/veh	13.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Vol, veh/h	102	0	16	4	0	2	4	11	384	2	4	3
Future Vol, veh/h	102	0	16	4	0	2	4	11	384	2	4	3
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	110	0	17	4	0	2	4	12	413	2	4	3
Number of Lanes	0	1	0	0	1	0	0	1	1	0	0	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	11.4	9.5	17.4	9.2
HCM LOS	B	A	C	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	86%	67%	100%	0%	0%
Vol Thru, %	0%	99%	0%	0%	0%	100%	0%
Vol Right, %	0%	1%	14%	33%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	386	118	6	7	141	100
LT Vol	15	0	102	4	7	0	0
Through Vol	0	384	0	0	0	141	0
RT Vol	0	2	16	2	0	0	100
Lane Flow Rate	16	415	127	6	8	152	108
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.027	0.637	0.234	0.012	0.012	0.227	0.14
Departure Headway (Hd)	6.033	5.526	6.636	6.69	5.905	5.4	4.694
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	588	647	544	538	600	658	754
Service Time	3.829	3.322	4.336	4.395	3.701	3.196	2.489
HCM Lane V/C Ratio	0.027	0.641	0.233	0.011	0.013	0.231	0.143
HCM Control Delay	9	17.7	11.4	9.5	8.8	9.8	8.3
HCM Lane LOS	A	C	B	A	A	A	A
HCM 95th-tile Q	0.1	4.6	0.9	0	0	0.9	0.5

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBT	SBR
Lane Configurations		
Traffic Vol, veh/h	141	100
Future Vol, veh/h	141	100
Peak Hour Factor	0.93	0.93
Heavy Vehicles, %	2	2
Mvmt Flow	152	108
Number of Lanes	1	1

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	22	0	17	17	0	16	5	8	1099	19	34	19
Future Volume (vph)	22	0	17	17	0	16	5	8	1099	19	34	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6			4.0	5.3			4.6
Lane Util. Factor		1.00		1.00	1.00			1.00	0.95			1.00
Frt		0.94		1.00	0.85			1.00	1.00			1.00
Flt Protected		0.97		0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)		1706		1770	1583			1770	3530			1770
Flt Permitted		1.00		1.00	1.00			0.95	1.00			0.95
Satd. Flow (perm)		1755		1863	1583			1770	3530			1770
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	0	18	18	0	17	5	9	1195	21	37	21
RTOR Reduction (vph)	0	40	0	0	16	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	2	0	18	1	0	0	14	1215	0	0	58
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8								
Actuated Green, G (s)		3.0		3.0	3.0			1.4	37.3			5.2
Effective Green, g (s)		3.0		3.0	3.0			1.4	37.3			5.2
Actuated g/C Ratio		0.05		0.05	0.05			0.02	0.62			0.09
Clearance Time (s)		4.6		4.6	4.6			4.0	5.3			4.6
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0			3.0
Lane Grp Cap (vph)		87		93	79			41	2194			153
v/s Ratio Prot					0.00			0.01	c0.34			c0.03
v/s Ratio Perm		0.00		c0.01								
v/c Ratio		0.02		0.19	0.01			0.34	0.55			0.38
Uniform Delay, d1		27.1		27.3	27.1			28.8	6.5			25.9
Progression Factor		1.00		1.00	1.00			0.83	1.79			1.00
Incremental Delay, d2		0.1		1.0	0.1			4.5	0.9			1.6
Delay (s)		27.2		28.4	27.1			28.5	12.7			27.4
Level of Service		C		C	C			C	B			C
Approach Delay (s)		27.2			27.8				12.8			
Approach LOS		C			C				B			

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	495	21
Future Volume (vph)	495	21
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3517	
Flt Permitted	1.00	
Satd. Flow (perm)	3517	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	538	23
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	559	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	41.7	
Effective Green, g (s)	41.7	
Actuated g/C Ratio	0.70	
Clearance Time (s)	5.3	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2444	
v/s Ratio Prot	c0.16	
v/s Ratio Perm		
v/c Ratio	0.23	
Uniform Delay, d1	3.3	
Progression Factor	1.00	
Incremental Delay, d2	0.2	
Delay (s)	3.5	
Level of Service	A	
Approach Delay (s)	5.8	
Approach LOS	A	

Intersection Summary

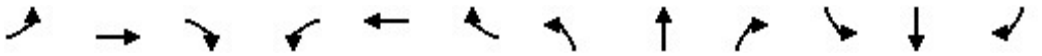
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	54	10	84	40	22	116	4	78	940	40	14	80
Future Volume (vph)	54	10	84	40	22	116	4	78	940	40	14	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	0.95			1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.99			1.00
Flt Protected		0.96	1.00	0.95	0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1788	1583	1681	1743	1583		1770	3518			1770
Flt Permitted		0.96	1.00	0.95	0.99	1.00		0.95	1.00			0.95
Satd. Flow (perm)		1788	1583	1681	1743	1583		1770	3518			1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	57	11	88	42	23	122	4	82	989	42	15	84
RTOR Reduction (vph)	0	0	81	0	0	114	0	0	1	0	0	0
Lane Group Flow (vph)	0	68	7	32	33	8	0	86	1030	0	0	99
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases	7	7		8	8		5	5	2		1	1
Permitted Phases			7			8						
Actuated Green, G (s)		9.9	9.9	7.8	7.8	7.8		14.4	71.5			12.0
Effective Green, g (s)		9.9	9.9	7.8	7.8	7.8		14.4	71.5			12.0
Actuated g/C Ratio		0.08	0.08	0.06	0.06	0.06		0.12	0.60			0.10
Clearance Time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		147	130	109	113	102		212	2096			177
v/s Ratio Prot		c0.04		c0.02	0.02			0.05	c0.29			c0.06
v/s Ratio Perm			0.00			0.01						
v/c Ratio		0.46	0.06	0.29	0.29	0.08		0.41	0.49			0.56
Uniform Delay, d1		52.5	50.7	53.5	53.5	52.7		48.8	13.9			51.5
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.10
Incremental Delay, d2		2.3	0.2	1.5	1.4	0.3		1.3	0.8			3.8
Delay (s)		54.8	50.9	55.0	54.9	53.0		50.1	14.7			60.4
Level of Service		D	D	D	D	D		D	B			E
Approach Delay (s)		52.6			53.7				17.4			
Approach LOS		D			D				B			

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	395	64
Future Volume (vph)	395	64
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frt	0.98	
Flt Protected	1.00	
Satd. Flow (prot)	3466	
Flt Permitted	1.00	
Satd. Flow (perm)	3466	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	416	67
RTOR Reduction (vph)	7	0
Lane Group Flow (vph)	476	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	69.4	
Effective Green, g (s)	69.4	
Actuated g/C Ratio	0.58	
Clearance Time (s)	5.3	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2004	
v/s Ratio Prot	0.14	
v/s Ratio Perm		
v/c Ratio	0.24	
Uniform Delay, d1	12.4	
Progression Factor	1.07	
Incremental Delay, d2	0.3	
Delay (s)	13.5	
Level of Service	B	
Approach Delay (s)	21.5	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	560	95	706	638	379	116	202	685	358	136	66
Future Volume (vph)	39	560	95	706	638	379	116	202	685	358	136	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	0.88	0.97	1.00	1.00
Frt	1.00	0.98		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3462		3433	3341		1770	1863	2787	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3462		3433	3341		1770	1863	2787	3433	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	41	596	101	751	679	403	123	215	729	381	145	70
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	547	0	0	59
Lane Group Flow (vph)	41	689	0	751	1082	0	123	215	182	381	145	11
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases									2			1
Actuated Green, G (s)	4.8	31.7		32.9	59.9		24.1	24.1	24.1	21.3	21.3	21.3
Effective Green, g (s)	4.8	31.7		32.9	59.9		24.1	24.1	24.1	21.3	21.3	21.3
Actuated g/C Ratio	0.04	0.24		0.25	0.45		0.18	0.18	0.18	0.16	0.16	0.16
Clearance Time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	63	822		846	1499		319	336	503	547	297	252
v/s Ratio Prot	0.02	c0.20		c0.22	0.32		0.07	c0.12		c0.11	0.08	
v/s Ratio Perm									0.07			0.01
v/c Ratio	0.65	0.84		0.89	0.72		0.39	0.64	0.36	0.70	0.49	0.04
Uniform Delay, d1	63.5	48.5		48.5	30.0		48.2	50.7	48.0	53.0	51.1	47.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.5	7.5		11.1	1.7		0.8	4.0	0.4	3.8	1.3	0.1
Delay (s)	85.1	55.9		59.7	31.8		49.0	54.7	48.4	56.9	52.4	47.6
Level of Service	F	E		E	C		D	D	D	E	D	D
Approach Delay (s)		57.5			43.2			49.7			54.7	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	133.5	Sum of lost time (s)	23.5
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

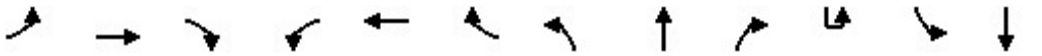
Intersection	
Intersection Delay, s/veh	14.4
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	14	52	817	393
Demand Flow Rate, veh/h	14	53	833	401
Vehicles Circulating, veh/h	404	825	60	10
Vehicles Exiting, veh/h	7	68	358	868
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.0	8.8	18.5	6.9
Approach LOS	A	A	C	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	14	53	833	401
Cap Entry Lane, veh/h	754	495	1064	1119
Entry HV Adj Factor	1.000	0.981	0.981	0.980
Flow Entry, veh/h	14	52	817	393
Cap Entry, veh/h	754	486	1044	1097
V/C Ratio	0.019	0.107	0.783	0.358
Control Delay, s/veh	5.0	8.8	18.5	6.9
LOS	A	A	C	A
95th %tile Queue, veh	0	0	8	2

Appendix F

Full Closure Construction Scenario HCM Analysis Worksheets



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	2	161	1	7	106	244	0	7	6	11	620	20
Future Volume (vph)	2	161	1	7	106	244	0	7	6	11	620	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9		5.9	5.9	5.9		5.9	5.9		4.6	5.9
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95	1.00		1.00	0.95
Frt		1.00		1.00	1.00	0.85		1.00	0.85		1.00	0.94
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1860		1770	1863	1583		3539	1583		1770	3333
Flt Permitted		1.00		0.60	1.00	1.00		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1855		1123	1863	1583		3539	1583		1770	3333
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	175	1	8	115	265	0	8	7	12	674	22
RTOR Reduction (vph)	0	0	0	0	0	214	0	0	7	0	0	5
Lane Group Flow (vph)	0	178	0	8	115	51	0	8	0	0	686	31
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			4		5	2		1	1	6
Permitted Phases	4			4		4			2			
Actuated Green, G (s)		13.0		13.0	13.0	13.0		1.5	1.5		36.6	42.7
Effective Green, g (s)		13.0		13.0	13.0	13.0		1.5	1.5		36.6	42.7
Actuated g/C Ratio		0.19		0.19	0.19	0.19		0.02	0.02		0.54	0.63
Clearance Time (s)		5.9		5.9	5.9	5.9		5.9	5.9		4.6	5.9
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		357		216	358	304		78	35		959	2108
v/s Ratio Prot					0.06			c0.00			c0.39	0.01
v/s Ratio Perm		c0.10		0.01		0.03			0.00			
v/c Ratio		0.50		0.04	0.32	0.17		0.10	0.00		0.72	0.01
Uniform Delay, d1		24.3		22.2	23.5	22.7		32.3	32.3		11.6	4.6
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.1		0.1	0.5	0.3		0.6	0.1		2.6	0.0
Delay (s)		25.4		22.2	24.0	23.0		32.9	32.3		14.1	4.6
Level of Service		C		C	C	C		C	C		B	A
Approach Delay (s)		25.4			23.3			32.6				13.6
Approach LOS		C			C			C				B

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	16.4
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	13
Future Volume (vph)	13
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	14
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	0	1	67	12	0	0	73	7	6	0	0	22
Future Vol, veh/h	0	1	67	12	0	0	73	7	6	0	0	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	73	13	0	0	79	8	7	0	0	24
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	1

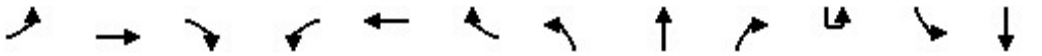
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	7.3	8.2	8.5	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	0%
Vol Thru, %	0%	54%	1%	0%	100%	100%	100%
Vol Right, %	0%	46%	99%	0%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	73	13	68	12	0	22	0
LT Vol	73	0	0	12	0	0	0
Through Vol	0	7	1	0	0	22	0
RT Vol	0	6	67	0	0	0	0
Lane Flow Rate	79	14	74	13	0	24	0
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.115	0.017	0.086	0.02	0	0.031	0
Departure Headway (Hd)	5.236	4.412	4.167	5.402	4.738	4.738	4.738
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	679	802	865	666	0	747	0
Service Time	3.012	2.187	1.867	3.104	2.524	2.524	2.524
HCM Lane V/C Ratio	0.116	0.017	0.086	0.02	0	0.032	0
HCM Control Delay	8.7	7.3	7.3	8.2	7.5	7.7	7.5
HCM Lane LOS	A	A	A	A	N	A	N
HCM 95th-tile Q	0.4	0.1	0.3	0.1	0	0.1	0

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	0
Future Vol, veh/h	0
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	0
Number of Lanes	1

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	18	1	13	1	0	5	14	328	12	103	13	443
Future Volume (vph)	18	1	13	1	0	5	14	328	12	103	13	443
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6		4.0	5.3			4.6	5.3
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95			1.00	0.95
Frt		0.94		1.00	0.85		1.00	0.99			1.00	0.99
Flt Protected		0.97		0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)		1711		1770	1583		1770	3520			1770	3521
Flt Permitted		1.00		1.00	1.00		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1759		1863	1583		1770	3520			1770	3521
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	19	1	14	1	0	5	15	353	13	111	14	476
RTOR Reduction (vph)	0	14	0	0	5	0	0	2	0	0	0	2
Lane Group Flow (vph)	0	20	0	1	0	0	15	364	0	0	125	491
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8								
Actuated Green, G (s)		0.9		0.9	0.9		0.8	13.8			4.5	18.1
Effective Green, g (s)		0.9		0.9	0.9		0.8	13.8			4.5	18.1
Actuated g/C Ratio		0.03		0.03	0.03		0.02	0.41			0.13	0.54
Clearance Time (s)		4.6		4.6	4.6		4.0	5.3			4.6	5.3
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		46		49	42		42	1441			236	1891
v/s Ratio Prot					0.00		0.01	0.10			c0.07	c0.14
v/s Ratio Perm		c0.01		0.00								
v/c Ratio		0.44		0.02	0.00		0.36	0.25			0.53	0.26
Uniform Delay, d1		16.2		16.0	16.0		16.2	6.6			13.6	4.2
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		6.7		0.2	0.0		5.1	0.1			2.1	0.1
Delay (s)		22.8		16.1	16.0		21.3	6.6			15.8	4.3
Level of Service		C		B	B		C	A			B	A
Approach Delay (s)		22.8			16.0			7.2				6.6
Approach LOS		C			B			A				A

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	33.7	Sum of lost time (s)	14.5
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	16
Future Volume (vph)	16
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	17
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	36	8	67	32	9	61	68	229	61	65	86	297
Future Volume (vph)	36	8	67	32	9	61	68	229	61	65	86	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	4.6	4.6	4.6	4.0	5.0			4.6	5.3
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95			1.00	0.95
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97			1.00	0.98
Flt Protected		0.96	1.00	0.95	0.97	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)		1789	1583	1681	1719	1583	1770	3428			1770	3478
Flt Permitted		0.96	1.00	0.95	0.97	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)		1789	1583	1681	1719	1583	1770	3428			1770	3478
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	38	8	71	34	9	64	72	241	64	68	91	313
RTOR Reduction (vph)	0	0	64	0	0	58	0	16	0	0	0	6
Lane Group Flow (vph)	0	46	7	21	22	6	72	289	0	0	159	348
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	Prot	NA
Protected Phases	7	7		8	8		5	2		1	1	6
Permitted Phases			7			8						
Actuated Green, G (s)		5.5	5.5	4.8	4.8	4.8	6.3	13.7			11.2	18.9
Effective Green, g (s)		5.5	5.5	4.8	4.8	4.8	6.3	13.7			11.2	18.9
Actuated g/C Ratio		0.10	0.10	0.09	0.09	0.09	0.12	0.25			0.21	0.35
Clearance Time (s)		4.6	4.6	4.6	4.6	4.6	4.0	5.0			4.6	5.3
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		182	161	149	152	140	206	869			367	1217
v/s Ratio Prot		c0.03		0.01	c0.01		0.04	c0.08			c0.09	0.10
v/s Ratio Perm			0.00			0.00						
v/c Ratio		0.25	0.04	0.14	0.14	0.04	0.35	0.33			0.43	0.29
Uniform Delay, d1		22.4	21.9	22.7	22.7	22.5	22.0	16.4			18.6	12.7
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		0.7	0.1	0.4	0.4	0.1	1.0	0.2			0.8	0.1
Delay (s)		23.1	22.0	23.1	23.1	22.6	23.0	16.7			19.5	12.8
Level of Service		C	C	C	C	C	C	B			B	B
Approach Delay (s)		22.4			22.8			17.9				14.9
Approach LOS		C			C			B				B

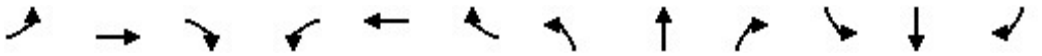
Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	54.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	39
Future Volume (vph)	39
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	41
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	689	211	469	505	339	98	86	351	526	122	69
Future Volume (vph)	53	689	211	469	505	339	98	86	351	526	122	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	0.88	0.97	1.00	1.00
Frt	1.00	0.96		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3415		3433	3326		1770	1863	2787	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3415		3433	3326		1770	1863	2787	3433	1863	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	55	718	220	489	526	353	102	90	366	548	127	72
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	326	0	0	57
Lane Group Flow (vph)	55	919	0	489	879	0	102	90	40	548	127	15
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases									2			1
Actuated Green, G (s)	7.2	38.1		21.3	52.3		13.4	13.4	13.4	25.6	25.6	25.6
Effective Green, g (s)	7.2	38.1		21.3	52.3		13.4	13.4	13.4	25.6	25.6	25.6
Actuated g/C Ratio	0.06	0.31		0.17	0.43		0.11	0.11	0.11	0.21	0.21	0.21
Clearance Time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	104	1067		599	1426		194	204	306	720	391	332
v/s Ratio Prot	0.03	c0.27		c0.14	0.26		c0.06	0.05		c0.16	0.07	
v/s Ratio Perm									0.01			0.01
v/c Ratio	0.53	0.86		0.82	0.62		0.53	0.44	0.13	0.76	0.32	0.05
Uniform Delay, d1	55.7	39.4		48.4	27.0		51.2	50.7	49.0	45.3	40.8	38.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.8	7.3		8.4	0.8		2.6	1.5	0.2	4.8	0.5	0.1
Delay (s)	60.5	46.7		56.9	27.8		53.8	52.3	49.2	50.0	41.3	38.5
Level of Service	E	D		E	C		D	D	D	D	D	D
Approach Delay (s)		47.5			38.2			50.5			47.4	
Approach LOS		D			D			D			D	

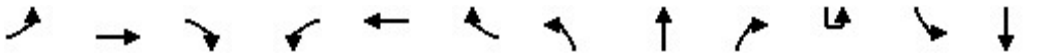
Intersection Summary			
HCM 2000 Control Delay	44.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	121.9	Sum of lost time (s)	23.5
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	11.2
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	11	50	485	735
Demand Flow Rate, veh/h	11	51	494	750
Vehicles Circulating, veh/h	757	489	42	19
Vehicles Exiting, veh/h	12	47	726	521
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.1	6.1	8.5	13.3
Approach LOS	A	A	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	11	51	494	750
Cap Entry Lane, veh/h	530	693	1083	1109
Entry HV Adj Factor	0.996	0.980	0.981	0.980
Flow Entry, veh/h	11	50	485	735
Cap Entry, veh/h	528	679	1063	1087
V/C Ratio	0.021	0.074	0.456	0.676
Control Delay, s/veh	7.1	6.1	8.5	13.3
LOS	A	A	A	B
95th %tile Queue, veh	0	0	2	6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	130	1	8	126	525	2	27	6	16	364	14
Future Volume (vph)	5	130	1	8	126	525	2	27	6	16	364	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9		5.9	5.9	5.9	4.6	5.9	5.9		4.6	5.9
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.95	1.00		1.00	0.95
Frt		1.00		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.93
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1858		1770	1863	1583	1770	3539	1583		1770	3303
Flt Permitted		0.99		0.78	1.00	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1839		1461	1863	1583	1770	3539	1583		1770	3303
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	137	1	8	133	553	2	28	6	17	383	15
RTOR Reduction (vph)	0	0	0	0	0	417	0	0	6	0	0	7
Lane Group Flow (vph)	0	143	0	8	133	136	2	28	0	0	400	20
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			4		5	2		1	1	6
Permitted Phases	4			4		4			2			
Actuated Green, G (s)		13.2		13.2	13.2	13.2	0.5	2.9	2.9		21.1	23.5
Effective Green, g (s)		13.2		13.2	13.2	13.2	0.5	2.9	2.9		21.1	23.5
Actuated g/C Ratio		0.25		0.25	0.25	0.25	0.01	0.05	0.05		0.39	0.44
Clearance Time (s)		5.9		5.9	5.9	5.9	4.6	5.9	5.9		4.6	5.9
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		452		359	458	389	16	191	85		696	1448
v/s Ratio Prot					0.07		0.00	c0.01			c0.23	0.01
v/s Ratio Perm		0.08		0.01		c0.09			0.00			
v/c Ratio		0.32		0.02	0.29	0.35	0.12	0.15	0.00		0.57	0.01
Uniform Delay, d1		16.5		15.3	16.4	16.7	26.3	24.2	24.0		12.7	8.5
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.4		0.0	0.4	0.5	3.5	0.4	0.0		1.2	0.0
Delay (s)		16.9		15.3	16.8	17.2	29.8	24.5	24.0		13.9	8.5
Level of Service		B		B	B	B	C	C	C		B	A
Approach Delay (s)		16.9			17.1			24.7				13.5
Approach LOS		B			B			C				B

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	16.4
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	11
Future Volume (vph)	11
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	12
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Vol, veh/h	0	0	118	6	0	0	4	111	27	5	0	0
Future Vol, veh/h	0	0	118	6	0	0	4	111	27	5	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	127	6	0	0	4	119	29	5	0	0
Number of Lanes	0	1	0	0	1	0	0	1	1	0	0	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	7.8	8.4	9	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	0%
Vol Thru, %	0%	84%	0%	0%	100%	100%	100%
Vol Right, %	0%	16%	100%	0%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	115	32	118	6	0	14	0
LT Vol	115	0	0	6	0	0	0
Through Vol	0	27	0	0	0	14	0
RT Vol	0	5	118	0	0	0	0
Lane Flow Rate	124	34	127	6	0	15	0
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.186	0.046	0.152	0.01	0	0.021	0
Departure Headway (Hd)	5.419	4.808	4.306	5.608	4.992	4.992	4.992
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	667	749	836	640	0	719	0
Service Time	3.119	2.508	2.017	3.324	2.708	2.708	2.708
HCM Lane V/C Ratio	0.186	0.045	0.152	0.009	0	0.021	0
HCM Control Delay	9.4	7.7	7.8	8.4	7.7	7.8	7.7
HCM Lane LOS	A	A	A	A	N	A	N
HCM 95th-tile Q	0.7	0.1	0.5	0	0	0.1	0

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBT	SBR
Lane Configurations		
Traffic Vol, veh/h	14	0
Future Vol, veh/h	14	0
Peak Hour Factor	0.93	0.93
Heavy Vehicles, %	2	2
Mvmt Flow	15	0
Number of Lanes	1	1

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	22	0	17	17	0	16	5	8	825	19	158	19
Future Volume (vph)	22	0	17	17	0	16	5	8	825	19	158	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6			4.0	5.3			4.6
Lane Util. Factor		1.00		1.00	1.00			1.00	0.95			1.00
Frt		0.94		1.00	0.85			1.00	1.00			1.00
Flt Protected		0.97		0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)		1706		1770	1583			1770	3527			1770
Flt Permitted		1.00		1.00	1.00			0.95	1.00			0.95
Satd. Flow (perm)		1755		1863	1583			1770	3527			1770
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	0	18	18	0	17	5	9	897	21	172	21
RTOR Reduction (vph)	0	40	0	0	16	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	2	0	18	1	0	0	14	916	0	0	193
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8								
Actuated Green, G (s)		3.0		3.0	3.0			1.4	24.8			17.7
Effective Green, g (s)		3.0		3.0	3.0			1.4	24.8			17.7
Actuated g/C Ratio		0.05		0.05	0.05			0.02	0.41			0.29
Clearance Time (s)		4.6		4.6	4.6			4.0	5.3			4.6
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0			3.0
Lane Grp Cap (vph)		87		93	79			41	1457			522
v/s Ratio Prot					0.00			0.01	c0.26			c0.11
v/s Ratio Perm		0.00		c0.01								
v/c Ratio		0.02		0.19	0.01			0.34	0.63			0.37
Uniform Delay, d1		27.1		27.3	27.1			28.8	13.9			16.7
Progression Factor		1.00		1.00	1.00			0.80	1.43			1.00
Incremental Delay, d2		0.1		1.0	0.1			4.6	1.9			0.4
Delay (s)		27.2		28.4	27.1			27.6	21.9			17.2
Level of Service		C		C	C			C	C			B
Approach Delay (s)		27.2			27.8				22.0			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	425	21
Future Volume (vph)	425	21
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3514	
Flt Permitted	1.00	
Satd. Flow (perm)	3514	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	462	23
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	483	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	41.7	
Effective Green, g (s)	41.7	
Actuated g/C Ratio	0.70	
Clearance Time (s)	5.3	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2442	
v/s Ratio Prot	0.14	
v/s Ratio Perm		
v/c Ratio	0.20	
Uniform Delay, d1	3.2	
Progression Factor	1.00	
Incremental Delay, d2	0.2	
Delay (s)	3.4	
Level of Service	A	
Approach Delay (s)	7.3	
Approach LOS	A	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	54	10	84	40	22	116	4	78	666	40	97	80
Future Volume (vph)	54	10	84	40	22	116	4	78	666	40	97	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	0.95			1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.99			1.00
Flt Protected		0.96	1.00	0.95	0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1788	1583	1681	1743	1583		1770	3509			1770
Flt Permitted		0.96	1.00	0.95	0.99	1.00		0.95	1.00			0.95
Satd. Flow (perm)		1788	1583	1681	1743	1583		1770	3509			1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	57	11	88	42	23	122	4	82	701	42	102	84
RTOR Reduction (vph)	0	0	81	0	0	114	0	0	2	0	0	0
Lane Group Flow (vph)	0	68	7	32	33	8	0	86	741	0	0	186
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases	7	7		8	8		5	5	2		1	1
Permitted Phases			7			8						
Actuated Green, G (s)		9.9	9.9	7.8	7.8	7.8		14.4	64.5			19.0
Effective Green, g (s)		9.9	9.9	7.8	7.8	7.8		14.4	64.5			19.0
Actuated g/C Ratio		0.08	0.08	0.06	0.06	0.06		0.12	0.54			0.16
Clearance Time (s)		4.6	4.6	4.6	4.6	4.6		4.0	5.0			4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		147	130	109	113	102		212	1886			280
v/s Ratio Prot		c0.04		c0.02	0.02			0.05	c0.21			c0.11
v/s Ratio Perm			0.00			0.01						
v/c Ratio		0.46	0.06	0.29	0.29	0.08		0.41	0.39			0.66
Uniform Delay, d1		52.5	50.7	53.5	53.5	52.7		48.8	16.3			47.5
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00			0.96
Incremental Delay, d2		2.3	0.2	1.5	1.4	0.3		1.3	0.6			5.8
Delay (s)		54.8	50.9	55.0	54.9	53.0		50.1	16.9			51.6
Level of Service		D	D	D	D	D		D	B			D
Approach Delay (s)		52.6			53.7				20.3			
Approach LOS		D			D				C			

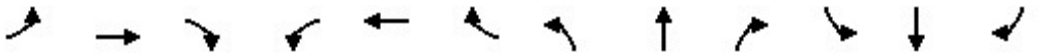
Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	242	64
Future Volume (vph)	242	64
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frt	0.97	
Flt Protected	1.00	
Satd. Flow (prot)	3429	
Flt Permitted	1.00	
Satd. Flow (perm)	3429	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	255	67
RTOR Reduction (vph)	12	0
Lane Group Flow (vph)	310	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	69.4	
Effective Green, g (s)	69.4	
Actuated g/C Ratio	0.58	
Clearance Time (s)	5.3	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1983	
v/s Ratio Prot	0.09	
v/s Ratio Perm		
v/c Ratio	0.16	
Uniform Delay, d1	11.7	
Progression Factor	1.05	
Incremental Delay, d2	0.2	
Delay (s)	12.4	
Level of Service	B	
Approach Delay (s)	26.8	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	445	170	776	568	379	287	202	753	358	136	66
Future Volume (vph)	39	445	170	776	568	379	287	202	753	358	136	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	0.88	0.97	1.00	1.00
Frt	1.00	0.96		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3392		3433	3327		1770	1863	2787	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3392		3433	3327		1770	1863	2787	3433	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	41	473	181	826	604	403	305	215	801	381	145	70
RTOR Reduction (vph)	0	26	0	0	0	0	0	0	571	0	0	59
Lane Group Flow (vph)	41	628	0	826	1007	0	305	215	230	381	145	11
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases									2			1
Actuated Green, G (s)	4.9	31.0		36.7	62.9		29.6	29.6	29.6	22.2	22.2	22.2
Effective Green, g (s)	4.9	31.0		36.7	62.9		29.6	29.6	29.6	22.2	22.2	22.2
Actuated g/C Ratio	0.03	0.22		0.26	0.44		0.21	0.21	0.21	0.16	0.16	0.16
Clearance Time (s)	5.5	5.9		5.5	5.8		5.9	5.9	5.9	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	60	735		881	1463		366	385	576	532	289	245
v/s Ratio Prot	0.02	c0.19		c0.24	0.30		c0.17	0.12		c0.11	0.08	
v/s Ratio Perm									0.08			0.01
v/c Ratio	0.68	0.85		0.94	0.69		0.83	0.56	0.40	0.72	0.50	0.04
Uniform Delay, d1	68.3	53.8		52.0	32.2		54.3	50.8	49.0	57.4	55.3	51.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	27.6	9.5		17.0	1.4		14.9	1.8	0.5	4.6	1.4	0.1
Delay (s)	95.8	63.4		69.0	33.5		69.3	52.6	49.5	62.0	56.7	51.5
Level of Service	F	E		E	C		E	D	D	E	E	D
Approach Delay (s)		65.3			49.5			54.6			59.5	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	54.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	143.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	36.4
Intersection LOS	E

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	14	52	1061	543
Demand Flow Rate, veh/h	14	53	1082	554
Vehicles Circulating, veh/h	557	1074	60	10
Vehicles Exiting, veh/h	7	68	511	1117
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.8	11.7	52.1	8.9
Approach LOS	A	B	F	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	14	53	1082	554
Cap Entry Lane, veh/h	647	386	1064	1119
Entry HV Adj Factor	1.000	0.981	0.981	0.980
Flow Entry, veh/h	14	52	1061	543
Cap Entry, veh/h	647	379	1044	1097
V/C Ratio	0.022	0.137	1.017	0.495
Control Delay, s/veh	5.8	11.7	52.1	8.9
LOS	A	B	F	A
95th %tile Queue, veh	0	0	21	3

Appendix K

Public Comment Letters and Responses

Appendix K
Public Comment Letters and Responses

Pursuant to the California Environmental Quality Act (CEQA) Guidelines, an Initial Study (IS)/Mitigated Negative Declaration (MND) was prepared by the City of Del Mar (City) for the Camino Del Mar Bridge Replacement Project (project). The Notice of Intent to adopt a MND was published in the Del Mar Times on May 5, 2022, and invited public comment through June 3, 2022. The Draft IS/MND was submitted to the State Clearinghouse (SCH) and the Governor's Office of Planning and Research and circulated for a 30-day public review period beginning on May 5, 2022, and ending June 3, 2022 (SCH No. 2022050089). This appendix includes comments received on the IS/MND, including written comments and comments submitted online through emails sent to the City.

Comment letters were received from the agencies and individuals shown on the matrix below. Several comment letters received during the Draft IS/MND public review period contained requests for revisions that resulted in clarifications and corrections to the Draft IS/MND text. These changes to the text are indicated by strikeout (deleted) and underline (inserted) markings in the Final IS/MND. Some of the comments do not pertain to the adequacy of analysis in the Draft IS/MND or to other aspects pertinent to the potential effects of the proposed project on the environment pursuant to CEQA. Regardless, a good faith effort has been made to respond to the comments submitted where they may touch on a relevant environmental topic.

Letter Identification	Commenting Party	Comment Numbers	Page Response Starts
A	California Coastal Commission	A-1 through A-7	K-3
B	California Department of Fish and Wildlife	B-1 through B-11	K-8
C	California State Lands Commission	C-1 through C-12	K-12
D	Aannestad Andelin and Corn LLP	D-1 through D-20	K-21
E	Kevin Grould	E-1	K-32

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From: Fiala, Shannon@Coastal <shannon.fiala@coastal.ca.gov>
Sent: Friday, June 3, 2022 2:44 PM
To: Adriana Jaramishian <ajaramishian@delmar.ca.us>
Cc: Escaron, Melissa@Coastal <melissa.escaron@coastal.ca.gov>; Leach, Stephanie@Coastal <stephanie.leach@coastal.ca.gov>
Subject: Coastal Commission staff comments on the Camino Del Mar Bridge Replacement Project Notice of Completion

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Ms. Jaramishian,

A-1 Coastal Commission staff appreciates the invitation to comment on the City of Del Mar's Camino Del Mar Bridge Replacement Project Notice of Completion. The mission of the Coastal Commission is to protect and enhance California's coast and ocean for present and future generations. As part of promoting this mission, the Commission has a long history of working together effectively with local governments and Caltrans to provide a safe and resilient transportation network to and along California's coastline while also protecting coastal natural resources.

A-2 Regarding development and risk associated with coastal hazards, Section 30253 of the Coastal Act states, in applicable part: *New development shall do all of the following: (a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard. (b) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs…* In addition to Section 30253(a), when a project site could be exposed to sea level rise, Coastal Act Section 30270 requires the Commission to "take into account the effects of sea level rise in coastal resources planning and management policies and activities in order to identify, assess, and to the extent feasible, avoid and mitigate the adverse effects of sea level rise." Coastal Act Section 30421 more broadly requires state and regional agencies, including the Coastal Commission and Caltrans, to "identify, assess, and, to the extent feasible and consistent with their statutory authorities, avoid, minimize, and mitigate the impacts of sea level rise."

A-3 The State of California has undertaken significant research regarding changing sea level and possible consequences to coastal resources and important assets. In April 2017, a working group of the Ocean Protection Council's (OPC) Science Advisory Team released *Rising Seas in California: An Update on Sea-Level Rise Science*. This report synthesized recent evolving research on sea level rise science, notably including a discussion of probabilistic sea level rise projections as well as the potential for rapid ice loss leading to extreme sea level rise. This science synthesis was integrated into the OPC *State of California Sea-Level Rise Guidance 2018 Update*. This guidance document provides high-level, statewide recommendations for state agencies and other stakeholders to follow when analyzing sea level rise. Notably, it provides a set of projections that OPC recommends using when assessing potential sea level rise vulnerabilities for various projects. Taken together, the *Rising Seas* science report and associated guidance document account for the current best available science on sea level

A-1 Comment noted. Because this comment does not address adequacy of the IS/MND, no response is necessary.

A-2 As stated in the "Overview" in Section 1.1 of the Draft IS/MND, the proposed project has been designed to address structural deficiencies of the existing bridge. Sea level rise was considered during the preliminary design process; the proposed increase in bridge height was necessary to accommodate projected sea level rise by increasing the mid span by 7.7 feet in height, the southern abutment by 2.76 feet in height, and the northern abutment by 1.16 feet in height. In accordance with State guidance and the National Research Council mid-range sea level rise scenario for 2100, the proposed bridge would accommodate 38 inches of sea level rise, thereby avoiding/minimizing adverse effects of projected sea level rise on both the structure, as well as potential adverse effects that could result from retention of a facility that was not designed to accommodate sea level rise (e.g., deck flooding and subsequent road closure, traffic flow interruptions, etc.). As stated in the IS/MND Overview, "In scenarios where the projected sea level rise exceeds an increased water surface elevation of 38 inches, the bridge would cease to be connected to a functional roadway system due to flooding of the connecting roadway to the south. The proposed design would accommodate a practical amount of sea level rise, but not extreme conditions where the surrounding community would be submerged underwater and bridge use for vehicular mobility would be irrelevant."

A-2 (cont.) The level of sea level rise modeled was based on coordination between the City and Coastal Commission staff. The project has been designed to be consistent with the City's Sea Level Rise Adaptation Plan and the Del Mar Community Plan (General Plan) and in consideration of the Coastal Hazards, Vulnerability, and Risk Assessment (ESA 2016) and 2018 Addendum (ESA 2018) prepared during the planning process for the City's Sea Level Rise Local Coastal Program Amendment. Use of the National Research Council mid-range scenario for 2100 (38 inches of potential sea level rise during a 100-year storm event) was based on two primary and related issues. First, 38 inches is the maximum rise that could occur under which a bridge would still feasibly connect to roadways carrying traffic. As part of the preliminary design process, other sea level rise scenarios (e.g., Ocean Protection Council State Guidance) were evaluated to determine the appropriate bridge height. During early coordination with the Coastal Commission, the enclosed Figure A, *Bridge Profile Comparison*, was shared with staff. Figure A presents a schematic overview of vertical profiles for potential bridge designs that would accommodate varying sea level rise scenarios, including up to 10 feet of sea level rise. In a future scenario with sea level rise exceeding 38 inches (and potentially up to 50 inches in the most extreme requested modeling condition), the bridge would no longer be connected to a functional roadway system based on projected flooding of the connecting roadway to the south. This is because under extreme sea level rise conditions, the North Beach District south of the bridge would be highly vulnerable to coastal and river flooding and is projected to be inundated (ESA 2016). As a result, the mid-range projection is considered both feasible and reasonable for planning and design purposes.

Second, because the bridge is only functional when connected to dry land (and serving associated population), additional review of bridge design assuming up to 50 inches of sea level rise could result in an over-designed facility, the implementation of which would result in inappropriate use of public funds. Based on these considerations and coordination between City, California Department of Transportation (Caltrans), and Commission staff, concurrence was obtained from the State Commission office on the approach to evaluating projected sea level rise impacts prior to study completion and IS/MND circulation. Conditions have not changed since study completion.

rise for the State of California, and these projections accordingly have been incorporated into the Coastal Commission's *Sea Level Rise Policy Guidance 2018 Science Update*. In addition, in May 2020, the Commission adopted *Making California's Coast Resilient to Sea Level Rise: Principles for Aligned State Action*, which calls for addressing **a minimum of 3.5 feet of sea level rise by 2050**. In August 2021, the Commission adopted *Critical Infrastructure at Risk: Sea Level Rise Planning Guidance for California's Coastal Zone* ("Critical Infrastructure Guidance"), which provides specific guidance for adapting critical infrastructure located in areas vulnerable to sea level rise.

The 2018 OPC Guidance provides sea level rise projections for twelve California tide gauges and recommends using the projections from the tide gauge closest to the project site. In this case, the La Jolla tide gauge is the closest gauge. The following table depicts the projected sea level rise in La Jolla under low, medium-high, and extreme risk aversion scenarios.

Year	Projected Sea Level Rise in Feet		
	Low Risk Aversion	Medium-High Risk Aversion	Extreme Risk Aversion
2040	0.9	1.3	1.8
2050	1.2	2.0	2.8
2060	1.3-1.6	2.5-2.7	3.9
2070	1.6-2.0	3.1-3.6	5.2
2080	1.9-2.5	4.0-4.6	6.7
2090	2.2-3.0	4.8-5.7	8.3
2100	2.5-3.6	5.8-7.1	10.2

Given the range of many uncertainties incorporated into the models, these projections are not precise, but are intended to reflect a range of potential outcomes. The low risk aversion scenario has an estimated 17% probability of being exceeded, and the medium-high risk aversion scenario has an estimated 0.5% probability, or a 1-in-200 probability, of being exceeded. The extreme risk aversion scenario accounts for developing research on the mechanisms driving the potential for extreme ice loss, and it does not have an associated probability at this time. While this scenario is an area of ongoing research, the physical processes that would lead to the extreme scenario of sea level rise are currently thought to be unlikely to occur before the latter part of the century. Because of the uncertain timing of the extreme rates of sea level rise, the 2018 OPC Guidance recommends analyzing the extreme risk aversion scenario (or H++ scenario) for "projects with a design life beyond 2050 that have little to no adaptive capacity, would be irreversibly destroyed or significantly costly to relocate or repair, or would have considerable public health, public safety, or environmental impacts."

A-3 cont.

As our understanding of sea level rise continues to evolve, it is possible that sea level rise projections will continue to change as well. While uncertainty will remain with regard to exactly how much sea levels will rise and when, the direction of sea level change is clear, and it is critical to continue to assess sea level rise vulnerabilities when planning for future development. Importantly, maintaining a precautionary approach that considers high and extreme sea level rise rates and includes planning for future adaptation will help ensure that decisions are made that will result in a resilient coastal California. This is especially the case for critical infrastructure, which the State of California defines broadly, with examples including roads and bridges. Because of the interconnected nature of critical

A-4

A-3 Comment noted. As stated in the comment, potential for risk of sea level rise to exceed the current bridge design is estimated at 1 in 200. As noted above, the current design was developed based on coordination and involvement with Coastal Commission staff. Subsequent to receipt of the enclosed comment letter, concurrence with the current design and the appropriateness of the evaluated sea level rise scenario was acknowledged via email to City staff by Ms. Shannon Fiala, the SoCal Coastal Program Manager for the California Coastal Commission Statewide Transportation Program. Ms. Fiala's email dated July 19, 2022, indicated that staff "agree that the study analyzed the appropriate SLR scenarios that demonstrate that the structure will be safe over its expected design life." Please also refer to the response to Comment A-2.

A-4 Comment noted. Please refer to the responses to Comments A-2 and A-3.

COMMENTS	RESPONSES
A-4 cont. infrastructure, the high cost and long lifespan of such facilities, and the oftentimes lengthy planning and permitting process needed for building or modifying such facilities, it is imperative that state and local agencies plan proactively for sea level rise adaptation for their critical infrastructure investments. In such cases, the OPC Guidance and Coastal Commission Guidance recommend that coastal development permit applicants for critical infrastructure projects understand the risks associated with higher sea level rise projections and develop adaptation pathways for those higher scenarios. The need for such advance planning is reflected in the Commission's Critical Infrastructure Guidance and also in Sections 30270 and 30421 of the Coastal Act. In general, the effect of a rise in sea level will be the landward migration of the intersection of the ocean with the shore, which will result in increased flooding, erosion, and storm impacts to coastal areas. For transportation infrastructure near the coast, such as bridges, an increase in water level will result in increased erosion and, in turn, an increase in scour, inundation of, and flood damage to infrastructure. More coastal infrastructure generally will be inundated or underwater than is inundated now, and infrastructure that is currently flooded part of the time will flood more frequently. Structures, such as bridges, that are adequate for current storm conditions may not be adequately protected in the future. Changing conditions could also alter the anticipated impacts of development upon coastal resources. In particular, coastal resources such as beaches and wetlands that are located just inland of the sea could disappear if they are squeezed between rising sea levels and a fixed line of development on the shoreline, thus impacting habitats, public access, recreation, visual, and other coastal resources.	
	A-5 Comment noted. Please refer to the responses to Comments A-2 and A-3.
A-5 Therefore, to be consistent with the Chapter 3 policies of the Coastal Act, proposed development must be sited, designed, and conditioned in such a way that considers the impact of the development upon coastal resources over its full design life, and must avoid, minimize, and mitigate those impacts as required by the Coastal Act. In summary, evaluating whether proposed development minimizes risks of coastal hazards at present and in the future usually involves examining projected sea level rise, in conjunction with anticipated impacts from extreme hazards events including strong storms and tsunami, over the design life or anticipated duration of the development. After this period, one can expect that the development would either be replaced, redeveloped at a different location, or removed. Although the exact amount of sea level rise that will actually occur over the design life or duration of the proposed development cannot be projected with certainty, the general trend of rising sea level is clear and it is critical to assess sea level rise vulnerabilities over the expected duration of the development being approved, especially when the proposals involve critical infrastructure investments aimed at serving the public.	
A-6 Therefore, Commission staff request that the Initial Study/Mitigated Negative Declaration, as well as the Hydraulic and Sediment Transport Analysis, prepared for the Camino Del Mar Bridge Replacement Project, are revised to analyze the potential impacts of medium-high and extreme risk aversion sea level rise scenarios on the proposed project over the expected life of the structure.	A-6 Based on previous agreements between the City and local Coastal Commission staff and the State Commission office, the design criteria used reflects a conservative estimation of sea level rise and ensures a reasonable and feasible project, as described in the response to Comments A-2 and A-3.

A-7 Please note that the comments provide herein are preliminary in nature. More specific comments may be appropriate as the project develops. Coastal Commission staff requests notification of any future activity associated with this project or related projects. Additionally, the comments contained herein are those of Coastal Commission staff only and should be construed as representing the opinion of the Coastal Commission itself. Thank you again for the opportunity to comment.

Sincerely,
Shannon Fiala

Shannon Fiala | SoCal Coastal Program Manager
Statewide Transportation Program
California Coastal Commission

(Please note that I am working fully remotely at this time.)



A-7 Comment noted. Coastal Commission staff will be notified of future activity associated with the project.

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
(858) 467-4201
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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

June 3, 2022

Adriana Jaramishian
Associate Planner
City of Del Mar
1050 Camino Del Mar
Del Mar, CA 92014
AJaramishian@delmar.ca.us

Subject: Camino Del Mar Bridge Replacement Project (Project), Mitigated Negative Declaration (MND), SCH #2022050089

Dear Ms. Jaramishian:

B-1

The California Department of Fish and Wildlife (CDFW) has reviewed the City of Del Mar's MND for the Project pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1] Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

CDFW ROLE

B-2

CDFW is California's **Trustee Agency** for fish and wildlife resources and holds those resources in trust by statute for all the people of the state. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a).) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a **Responsible Agency** under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW may also need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 *et seq.*) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 *et seq.*), the Project Proponent may seek related take authorization as provided by the Fish and Game Code.

CDFW also administers the Natural Community Conservation Planning (NCCP) program, a California regional habitat conservation planning program. The City was a local jurisdiction

[1] CEQA is codified in the California Public Resources Code in section 21000 *et seq*. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

B-1 This comment is introductory in nature and provides background information pertaining to the commentor. Because the comment does not address adequacy of the IS/MND under CEQA, no response is required.

B-2 This comment is explanatory in nature and provides background information pertaining to the commentor and denotes the role of the CDFW as a Responsible and Trustee Agency. The CDFW's jurisdiction is recognized. Because the comment does not address adequacy of the IS/MND under CEQA, no additional response is required.

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B-2 cont.

participant in the early planning of the Subregional Multiple Species Conservation Program (MSCP) in the 1990's. However, a subarea plan (SAP) was not finalized and no permits were issued to the City by the Wildlife Agencies (jointly, CDFW and the U.S. Fish and Wildlife Service (USFWS)).

PROJECT DESCRIPTION SUMMARY

Proponent: City of Del Mar (City)

Objective: The Project would replace the existing Camino Del Mar bridge (bridge No. 57C-0209) to provide continued vehicle, pedestrian, and bicycle movement along Camino Del Mar as it crosses the San Dieguito Lagoon in the City. The Project would maintain critical north-south access along the same horizontal roadway alignment with an improved design for access and public safety, and improved reliability of future access in consideration of projected coastal hazards. The replacement bridge design consists of a five-span cast-in-place prestressed concrete box girder bridge that would be slightly longer, wider, and higher than the existing bridge. The number of piers in the lagoon would be reduced from 10 to 4. The roadway approach zones within Camino Del Mar would also require modifications to accommodate the raised elevation of the bridge, including sidewalk reconstruction to meet the proposed pedestrian sidewalks on both sides of the replacement bridge.

B-3

Location: The Camino del Mar bridge (bridge) is located in western San Diego County 1.01 miles west of Interstate (I-) 5 within the City. The Project site is located on Camino del Mar, south of Via de la Valle and Border Avenue, north of 23rd Street, and crosses the San Dieguito River Lagoon mouth with the Pacific Ocean. The project is in the City's Floodway Zone and is in the Coastal Zone; however, is not within a review area under the National Oceanic and Atmospheric Administration (NOAA). The Project is located within the Lagoon Overlay Zone of the City's Local Coastal Program Implementing Ordinances.

Biological Setting: Various components of the Project could potentially have significant temporary and permanent impacts on both marine and terrestrial biological resources and organisms without mitigation. A general biological survey, including vegetation mapping, was conducted for the Project site and an approximately 200-foot surrounding area (i.e., study area) on July 16, 2018, to verify and update the previous mapping conducted in 2012, 2013, and 2015. An additional biological survey of the study area was conducted on June 30, 2021, to verify site conditions were consistent with the results of previous studies and to update supporting maps. All biological surveys were conducted by HELIX Environmental, including focused surveys for sensitive plant and bird species.

Approximately 12.83 acres of potentially jurisdictional waters of the U.S. were identified in the Project study area, consisting of 1.71 acres of wetlands and 11.12 acres of non-wetland waters. Areas considered waters of the U.S. may be subject to United States Army Corps of Engineers (USACE) and RWQCB jurisdiction. These 12.83 acres as well as an additional 0.01 acre of Southern Willow Scrub are also considered potentially jurisdictional habitats and coastal wetlands, under the jurisdiction of CDFW and California Coastal Commission, respectively. Specifically, these areas consist of 1.72 acres of wetlands/special aquatic sites and 11.12 acres of non-wetland waters.

Three sensitive plant species were detected in the study area: red sand-verbena (*Abronia maritima*), southwestern spiny rush (*Juncus acutus* var. *leopoldii*), and Torrey pine (*Pinus*

B-3 This comment provides a summary of the project description with emphasis on the biological conditions as background for the subsequent comments. The comment does not address adequacy of the IS/MND under CEQA, and no additional response is required.

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torreyana ssp. *torreyana*). Although found present in the study area, none of these three plant species were detected within the Project site itself. No federally or state listed endangered or threatened plant species were found to be present in the study area.

One special-status animal species was detected in the Project study area during surveys for the Project, the CESA-listed endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingii*). Three Belding's savannah sparrow territories were found in the Project study area during the 2013 surveys east of the bridge, no individuals were observed during surveys in 2018, and three territories were observed in 2022, east of the bridge in habitat on the east side of the lagoon. Suitable nesting and foraging habitat for this species does not occur within the impact area; therefore, implementation of the Project is not anticipated to result in direct impacts Belding's savannah sparrow or its habitat/territory. No other direct impacts to sensitive animal species are expected as a result of the Project.

B-3 cont.

No impacts to riparian habitat would occur because of the Project; however, direct impacts (permanent and temporary) to other sensitive natural communities/habitats would occur, including Diegan coastal sage scrub (DCSS), including disturbed CSS, beach, intertidal (open water), and mudflat.

Timeline: The proposed Project is estimated to be constructed over 27 months during five distinct construction stages: (1) site preparation; (2) demolition and replacement of the east side; (3) demolition and replacement of the west side; (4) bridge median improvements; and (5) final improvements.

COMMENTS AND RECOMMENDATIONS

B-4

CDFW offers the comments and recommendations below to assist the City in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct, and indirect impacts on fish and wildlife (biological) resources. Recommendations may also be included to improve the document.

Specific Comments

B-5

CDFW concurs with the Biological Mitigation Measures described in the draft MND to reduce impacts to sensitive species and natural resources. We make the following recommendations regarding mitigation requirements that fall under CDFW's jurisdiction as a Trustee Agency and a Responsible Agency.

B-6

1. Results of preconstruction surveys for Belding's savannah sparrow. Belding's savannah sparrow is CESA-listed as endangered. "Endangered species" as defined by CESA means a native species that is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat or change in habitat (Fish and Game Code). As noted in the MND, impacts to Belding's savannah sparrow habitat would likely require the City to seek an Incidental Take Permit (ITP) through Section 2081 of the Fish and Game Code for potential impacts on Belding's Savannah sparrow habitat and provide mitigation for habitat loss. Though the MND states that there is not suitable nesting habitat for Belding's savannah sparrow in the Project impact footprint, we request the City keep CDFW apprised of the results of pre-construction surveys for Belding's.

B-7

2. Mitigation for CSS. CDFW concurs with the requirement set in BIO-4 to mitigate for permanent impacts to 0.16 acre of CSS at a 2:1 ratio. In addition, CDFW requests the opportunity to

B-4 Introductory comments regarding the Camino Del Mar Bridge Replacement Draft IS/MND are noted, and specific comments are responded to individually below.

B-5 Concurrence with biological mitigation measures identified in the Draft IS/MND is noted. Responses to specific mitigation measure recommendations are addressed below.

B-6 The general comments regarding Belding's savannah sparrow are noted. As indicated in Section 2.IV(a) of the Environmental Initial Study Checklist, focused surveys for special status animals were in progress at the time of circulation. All five survey visits have been completed for Belding's savannah sparrow. Three territories were detected, all of which occur on the eastern side of the lagoon adjacent to the Los Angeles–San Diego–San Luis Obispo (LOSSAN) corridor railroad, outside of the project impact footprint. The observed territories are consistent with those identified during earlier surveys in 2013.

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review and approve the habitat mitigation plan, including use of off-site mitigation areas. Evidence that on- and off-site mitigation has been purchased and/or placed within a biological open space easement shall be provided to CDFW and City prior to impacts occurring on the Project site.

3. Permitting for impacts to wetlands. We recommend the City engage in early consultation regarding impacts to wetland resources under CDFW jurisdiction.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a data base which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNNDB field survey form can be found at the following link: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/CNDDB_FieldSurveyForm.pdf. The completed form can be mailed electronically to CNDDB at the following email address: CNDDB@wildlife.ca.gov. The types of information reported to CNDDB can be found at the following link: http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp.

FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying Project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

CONCLUSION

CDFW appreciates the opportunity to comment on the MND to assist the City in identifying and mitigating Project impacts on biological resources.

Questions regarding this letter or further coordination should be directed to Meredith Osborne, Environmental Scientist, at Meredith.Osborne@wildlife.ca.gov.

Sincerely,

DocuSigned by:
David Mayer
D700B4520375406...

David Mayer
Environmental Program Manager
South Coast Region

ec: CDFW
David Mayer, San Diego – David.Mayer@wildlife.ca.gov
Jennifer Turner, San Diego – Jennifer.Turner@wildlife.ca.gov
Meredith Osborne, San Diego – Meredith.Osborne@wildlife.ca.gov
Cindy Hailey, San Diego – Cindy.Hailey@wildlife.ca.gov
State Clearinghouse, Office of Planning and Research – State.Clearinghouse@opr.ca.gov

B-6 (cont.) As described in the IS/MND, implementation of the project is not anticipated to result in direct impacts to the Belding's savannah sparrow or its habitat/territory, as suitable nesting and foraging habitat for this species does not occur within the impact area. Pursuant to mitigation measure BIO-1, CDFW will be informed of all results related to pre-construction surveys for Belding's savannah sparrow, should they be needed (i.e., if construction activities are scheduled to start during the breeding season from March 15 through June 30). Applicable documentation will be provided to CDFW should a Section 2081(b) Incidental Take Permit be needed for potential impacts to Belding's savannah sparrow. Mitigation measure BIO-1 has been revised to require pre-construction surveys within one year of construction to account for the time that may be needed to obtain an Incidental Take Permit prior to construction, as well as correcting the start of the breeding season for Belding's savannah sparrow from February 15 to March 15. Please refer to Section 2.IV(a) of the Final IS/MND for the revisions presented in tracked changes.

B-7 The Habitat Restoration Plan, to be prepared pursuant to mitigation measure BIO-4, will be submitted to CDFW for review and approval once completed. Evidence of the implementation of on- and off-site mitigation will be provided to the City and CDFW prior to any ground disturbance or construction activities affecting undeveloped areas.

B-8 The City will consult with CDFW regarding permitting for impacts to wetland resources under CDFW jurisdiction during the next phase of project implementation as part of the Plans, Specifications, and Estimates approvals.

B-9 Special status species and natural communities detected during project surveys will be reported to CNDDB as indicated in this comment; no further response is needed.

B-10 Comment noted. CDFW filing fees will be submitted upon filing of the Notice of Determination.

B-11 Comments noted. Future coordination will be directed to Ms. Osborne, as requested.

STATE OF CALIFORNIA GAVIN NEWSOM, *Governor*

CALIFORNIA STATE LANDS COMMISSION
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Established in 1938

June 3, 2022

File Ref: SCH #2022050089

City of Del Mar
Attn: Adriana Jaramishian
050 Camino Del Mar
Del Mar, CA 92014

VIA ELECTRONIC MAIL ONLY (ajaramishian@delmar.ca.us)

Subject: Initial StudyMitigated Negative Declaration for Camino Del Mar Bridge Replacement Project, San Diego County

Dear Adriana Jaramishian:

C-1 The California State Lands Commission (Commission) staff has reviewed the Initial Study/Mitigated Negative Declaration (IS/MND) for the Camino Del Mar Bridge Replacement Project (Project), which is being prepared by the City of Del Mar (City). The City, as the public agency proposing to carry out the Project, is the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.) The Commission is a trustee agency for projects that could directly or indirectly affect State sovereign land and their accompanying Public Trust resources or uses. Additionally, because the Project involves work on State sovereign land, the Commission will act as a responsible agency.

Commission Jurisdiction and Public Trust Lands

C-2 The Commission has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The Commission also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6009, subd. (c); 6009.1; 6301; 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine.

C-1 This comment is introductory in nature, provides background information pertaining to the commentor, and denotes the role of the California State Lands Commission as a Responsible and Trustee Agency. The comment does not address adequacy of the IS/MND under CEQA, and no response is required.

C-2 The State Lands Commission's jurisdiction as stated is recognized, and the lands described are known as held in public trust. The comment does not address adequacy of the IS/MND under CEQA, and no response is required.

C-2 cont.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the state for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court.

C-3

After review of the information contained in the IS/MND, the existing bridge crossing the San Dieguito River is located on State sovereign tide and submerged land under the jurisdiction of the Commission. In June 2000, the Commission authorized the issuance of Lease No. PRC 8181.9 with the City of Del Mar for the bridge right-of-way. Based upon the information provided and a review of our in-house records, it appears the project will expand the bridge beyond the existing lease area. Therefore, the proposed project will require an application for a new lease or an amendment of the existing lease. An application may be submitted to the Commission through the online application portal (OSCAR.slc.ca.gov). If you have questions specific to jurisdiction, lease provisions, or the application process, please contact Public Land Management Specialist Kelly Connor (contact information below).

Project Description

C-4

The City is proposing to replace the existing Camino Del Mar bridge (Bridge No. 57C-0209) to provide continued vehicle, pedestrian, and bicycle movement along Camino Del Mar as it crosses the San Dieguito Lagoon. The Project would maintain critical north-south access along the same horizontal roadway alignment with an improved design for access and public safety, and improved reliability of future access in consideration of projected coastal hazards. The replacement bridge design consists of a five-span, cast-in-place, prestressed concrete box girder bridge that would be slightly longer, wider, and higher than the existing bridge. The number of piers (footers) in the lagoon would be reduced from 10 to 4. The roadway approach zones within Camino Del Mar would also require modifications to accommodate the raised elevation of the bridge.

The City proposes to implement the Project to meet the following objectives and needs:

- Reduce the number of piers in the lagoon
- Accommodate two-way pedestrian and bicycle movement across the bridge

C-3 Comment noted. As appropriate, an application for a new lease or an amendment of the existing lease will be submitted following project approval and final design. This has been clarified in the Final IS/MND project description, as well as in the list of approvals required by other public agencies. Should specific questions arise during application preparation regarding jurisdiction, lease provisions, or the application process, the City or appropriate representative will contact identified staff.

C-4 This comment provides a summary of the project description and goals of the project as background for the subsequent comments. The comment does not address adequacy of the IS/MND under CEQA, and no response is required.

- Accommodate a sea level rise scenario of 38 inches during a 100-year flood event

C-4 cont.

From the Project Description, Commission staff understands that the Project would include the following components that have potential to affect State sovereign land:

- Temporary access for Installation of a cofferdam system and work trestles
- Pier removal
- Installation of new piers

Environmental Review

C-5

Commission staff requests that the City consider the following comments on the Project's IS/MND to ensure that impacts to State sovereign land are adequately analyzed for the Commission's use of the IS/MND when considering a future lease application for the Project.

General Comments

C-6

1. Project Description: A thorough and complete Project Description should be included in the Construction Methods and Phasing section in order to facilitate meaningful environmental review of potential impacts, mitigation measures, and alternatives. The Project description should be as precise as possible in describing the details of all allowable activities (e.g., types of equipment or methods that would be used, maximum area of impact or volume of sediment removed or disturbed, seasonal work windows, locations for material disposal, etc.), as well as the details of the timing and length of activities. In particular, illustrate on figures and engineering plans and provide written description of activities occurring below the mean high tide line for Project area waterways.

C-7

The IS/MND states, on page 3, that "Temporary construction easements would be obtained from the California State Lands Commission for the temporary work trestle that would temporarily encroach into state tidelands…" To clarify, all construction activities occurring on lands under the Commission's jurisdiction will require a lease or lease amendment from the Commission, which the Commission may issue in its sole discretion. Thorough descriptions will facilitate Commission staff's determination of the extent and locations of its leasing jurisdiction, make for a more robust analysis of the work that may be performed, and minimize the potential for subsequent environmental analysis to be required.

C-8

Commission staff request that more detail be provided in the Construction Methods and Phasing section regarding the following:

C-5 This comment requests consideration of the comments that follow. Specific comments are responded to individually below.

C-6 The IS/MND contains a highly descriptive project description that includes all major component parts and construction means and methods of the project and exceeds the requirements for CEQA purposes. Under the "Construction Methods and Phasing" subheading in Section 1.1 of the IS/MND, it is noted that the temporary work trestle would consist of an approximately 50-foot-wide elevated platform that spans the entire floodway from each existing abutment, on both sides of the existing bridge. Cofferdam systems would be required for removal of existing piers and installation of the new bridge foundations and column. Temporary falsework would be installed to form and construct the bridge foundations and bridge spans. Existing wood piles would be removed to at least one foot below the general scour depth or entirely removed if they conflict with the proposed foundations of the replacement bridge. Access for construction equipment at the ground level would be required for the removal of the falsework due to the low overhead clearance of the bridge.

IS/MND Figure 5 provides a schematic of a bridge section, with information regarding deck amenities (travel lanes, barriers, etc.), utilities locations, cast-in-place pre-stressed concrete box girders, cast-in-drilled-hole (CIDH) concrete pile sizing, and elevations of each of these

C-6 (cont.) elements. Cofferdam schematics (including element height and width) are also provided on Figure 5.

As specifically noted, construction methodology would be part of the means and methods determined by the construction contractor. All elements will be required to meet permitting agency standards, regulatory requirements, and approved plans. All work completed for bridge replacement, including access to bridge construction zones, replacement implementation, equipment staging, etc., would occur within the impact footprint identified in Figure 6 of the IS/MND.

Under the "Construction Noise" analysis contained in Section 2.XIII(a) of the Environmental Initial Study Checklist, it is noted that "A variety of standard construction equipment would be used, including, but not limited to, backhoes/loaders, excavators, tractors, dozers, concrete breakers, concrete saws, pile installation equipment, and miscellaneous trucks with a list of specific equipment types provided in the Air Quality/Greenhouse Gas report, where it is relevant for modeling purposes." This statement has been added to the Construction Methods and Staging discussion in the Final IS/MND.

The IS/MND contains specific times and scheduling parameters concerning the overall construction periods. There are, as noted, five construction phase schedules that have been evaluated: site preparation, east-side bridge replacement, west-side bridge replacement, bridge median improvements, and final improvements (e.g., curb and gutter, signage, storm drains, tree wells, etc.) requiring 3, 14, 14, 3 and 2 months, respectively. As noted in the Preface to the Final IS/MND, an engineering review of the completed technical studies and coordination with Caltrans resulted in the extension of the construction duration from 27 to 36 months. A 36-month construction duration would provide additional flexibility for the general contractor and would require up to 14 temporary nighttime closures of the Camino del Mar roadway (compared to the 12 temporary nighttime closures identified in the Public Review Draft MND). Refer to the Final IS/MND Project Description for a summary of anticipated construction activities by stage and approximate duration of each activity; and to Table 3, *Off-road Equipment*, of the Air Quality and Greenhouse Gas Emissions Assessment

C-6 (cont.) Letter for the assumed equipment types and quantity used. A reference to the list of specific equipment types provided in the Air Quality and Greenhouse Gas Assessment Letter has been added to the Construction Methods and Phasing section of the Final IS/MND.

For CEQA purposes, an IS/MND is legally adequate if it makes a good faith effort at full disclosure and provides a reasonable analysis of the project's significant environmental impacts. The project description provided in the IS/MND is both accurate and developed to the appropriate level of detail to identify the extent of ground disturbance and projected magnitude (i.e., CEQA significance level) of associated impacts to support the discretionary actions proposed. Specific detail on construction materials, timing, and locations will be provided to the State Lands Commission as part of the lease application process. This information would provide clarification as to detail and is not anticipated to result in new or greater CEQA-significant impacts than disclosed in the Final IS/MND.

C-7 See the responses to Comment C-3 and C-6. The quoted statement has been revised to remove reference to temporary construction easements and note that "A new lease agreement or an amendment of the existing lease issued to the City for the bridge right-of-way in June 2000 (Lease No. PRC 8181.9) would be obtained from the California State Lands Commission." Additional information will be provided during the application process.

C-8 Refer to the response to Comment C-6 for general information regarding the adequacy of the project description for CEQA purposes. More detailed information to address the specific questions presented in this comment is provided below and has been added to the Construction Methods and Staging discussion in the Final IS/MND.

Generally, and as addressed in the IS/MND, cofferdams are constructed of steel sheet piles or other shoring materials and would be installed and removed by crane with an attached vibratory hammer. Cofferdams may be dewatered as needed using pumps to perform demolition and/or new construction activities. Other equipment such as excavators, backhoes, and loaders may be used for excavation, backfill, material handling, or additional shoring.

C-8 (cont.) The temporary trestle may be installed and removed via crane, vibratory hammer, impact hammer, and forklifts. Common earthwork equipment such as excavators, loaders, etc. may be used at the bridge approaches where the trestle starts and ends.

Existing pier footings may be removed via sawcutting and/or excavators with concrete breaking attachments. New piers would be constructed of CIDH piles, which may be constructed using cranes, drill rigs, oscillators and/or rotators, vibratory hammers, forklifts, and concrete boom trucks. Common earthwork equipment such as loaders, etc. may be used for handling of drilling spoils. Equipment may be located on the temporary trestle, or on the ground below with proper protective measures. As a condition of approval of the project, the contractor would be responsible for developing a plan to keep debris out of the lagoon. This may include suspending protective covers from the existing bridge, on the ground below, or floating on the water. The falsework would also serve to protect the lagoon from debris.

As noted in the above responses, additional non-CEQA required information will be provided during the lease application process. Development of detailed construction methodology is the responsibility of the construction contractor, to be prepared pursuant to applicable permitting agency standards, regulatory requirements, and approved plans. The equipment identified above that may be utilized for construction of the cofferdams, temporary trestle, and new bridge (or their equivalent) was previously identified in the list of equipment used to evaluate potential impacts of the proposed project, including effects related to air quality, greenhouse gas emissions, and noise. Additional information has been provided for clarification; no new impacts not previously identified in the Draft IS/MND would occur.

C-8 cont.

- What type of cofferdam will be used to dewater the construction area? What equipment will be used for installation and removal?
- What equipment will be used for installation and removal of the trestle?
- How will the pier footers be removed and the new pier footers installed? What equipment will be used and where will it be placed?
- How will the Project prevent debris from falling into the San Dieguito River lagoon during construction?

Biological Resources

C-9

2. Page 33 of the IS/MND states that "Relative to potential interference with the movement of native resident or migratory fish, construction of the replacement bridge would temporarily disturb benthic and aquatic habitats within the lagoon," however, fish and other aquatic species (other than eelgrass) are not discussed in the Biological Resources section. Commission staff requests that the IS/MND include additional information on the benthic and aquatic species affected by Project construction (including the use of a vibratory pile driver as mentioned in the "Noise" section).

Cultural Resources

C-10

3. Title to Resources Within Commission Jurisdiction: The IS/MND should state that the title to all cultural resources on or in the tide and submerged lands of California is vested in the State and under the jurisdiction of the Commission (Pub. Resources Code, § 6313). Commission staff requests that the City consult with Staff Attorney Jamie Garrett should any cultural resources on state lands be discovered during construction of the proposed Project.

   Staff requests that the following statement be included in the IS/MND's Mitigation Monitoring Program: "The final disposition of archaeological, historical, and paleontological resources recovered on State land under the jurisdiction of the California State Lands Commission must be approved by the Commission."

Climate Change

C-11

4. The Project is designed to accommodate 38 inches of sea level rise during a 100-year flood scenario because, based on preliminary design studies, "[i]n scenarios where the projected sea level rise exceeds an increased water surface elevation of 38 inches, the bridge would cease to be connected to a functional roadway system due to flooding of the connecting roadway to the south." While the IS/MND describes this as "a mid-range sea level rise scenario," that is based on an outdated 2012 National Research Council Report. More recent reports, such as the 2018 Ocean Protection Council

C-9 Section 2.IV, *Biological Resources*, of the Environmental Initial Study Checklist has been revised to include additional discussion of migratory and special status fish that was included in the Biological Resources Letter Report, as well other aquatic species potentially present at the project site based on correspondence with the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS). These revisions have not changed the analysis or generated any new and unavoidable significant impacts. HELIX contacted NOAA NMFS in June 2022 to request an Endangered Species Act Species List for the project study area. Based on NOAA's review of the project, it was determined in July 2022 that no aquatic species listed for protection pursuant to the federal Endangered Species Act are expected to occur in the project area, indicating that there are no new or unavoidable significant environmental impacts not previously analyzed in the IS/MND. However, the San Dieguito River mouth likely provides passage and habitat for some common marine fish species managed by the NOAA NMFS Pacific Fishery Management Council. These fish include: topsmelt (*Atherinops affinis*), northern anchovy (*Engraulis mordax*), California grunion (*Leuresthes tenuis*), and Pacific Coast groundfish species such as California halibut (*Paralichthys californicus*), California skate (Raja inornate), leopard shark (*Riakis semifasciata*), and speckled sanddab (*Citharichthys stigmaeus*).

As described in the Draft IS/MND, project impacts (permanent and temporary) to open water and mudflat habitats would not create a significant environmental impact. The project would result in less structure within the open water than the current condition due to the removal of 10 pier structures and replacement with 4 sets of oblong column footings. The reduction in structure from 0.05 acre

C-9 (cont.) (approximately 2,350 square feet) to 0.006 acre (approximately 257 square feet) and increase in spacing from approximately 54 feet apart to 135 feet apart would ultimately reduce the obstruction of flow within the open water compared to existing conditions and result in a long-term net environmental/ecological benefit to the San Dieguito River mouth and its associated habitats. The natural ebb and flow of tidal current would be enhanced, tidal circulation and related functions under the bridge would improve, and intertidal habitat quality and functions would be uplifted. Ultimately, the temporary impacts to benthic and aquatic habitats by the proposed replacement would be offset as a result of the reduction in structure and overall net increase to open water area.

To further reduce potential temporary effects to aquatic and benthic habitats and passage of fish species through the project site, appropriate Best Management Practices (BMPs) would be employed to address issues such as water quality and hydroacoustic and vibration effects. Construction personnel would consult the Caltrans Construction Best Management Practices Manual (Caltrans, 2017) to determine the best BMP for application in a tidal environment.

C-10 As noted in the comment, the City will continue to consult with State Lands Commission Staff should cultural resources be discovered on lands under the jurisdiction of the State Lands Commission during project construction. The requested statement has been added to the Final IS/MND in Section 2.V under the “Discussion” subheading and inserted into mitigation measure CUL-1.

C-11 Please refer to the responses to Comments A-2 and A-3 for discussion of the sea level rise study rationale. Additional comments regarding the preliminary design studies, flooding, and associated bridge integrity will be addressed during the lease application process, as stated in the comment. Overall resilience of the surrounding community (i.e., the neighborhoods south of the bridge) to sea level rise is beyond the purview of bridge rehabilitation and the scope of this project.

C-11 cont.

State Guidance, predict more severe sea level rise. As part of the Commission's lease application process, the applicant should be prepared to discuss the preliminary design studies, including how anticipated flooding may affect the integrity of the bridge, and if there are any approaches that may increase the surrounding community's resiliency to sea level rise.

Thank you for the opportunity to comment on the IS/MND for the Project. As a responsible and trustee agency, the Commission will rely on the IS/MND for issuing a lease as specified above (see Section "Commission Jurisdiction and Public Trust Lands"). We request that you consider our comments before adopting the IS/MND.

C-12

Please send electronic copies of the adopted IS/MND, Mitigation Monitoring Program, and Notice of Determination when they become available. Please note that federal and state laws require all government entities to improve accessibility of information technology and content by complying with established accessibility requirements. (29 U.S.C. § 794d; 36 C.F.R. § 1194.1 et seq.; Gov. Code, § 7405.) California State law prohibits State agencies from publishing on their websites content that does not comply with accessibility requirements. (Gov. Code, § 115467.) Therefore, any documents submitted to Commission staff during the processing of a lease or permit, including all CEQA documentation, must meet accessibility requirements for Commission staff to place the application on the Commission agenda.

Refer questions concerning environmental review to Cynthia Herzog, Senior Environmental Scientist, at cynthia.herzog@slc.ca.gov or (916) 574-1310. For questions concerning archaeological or historic resources under Commission jurisdiction, please contact Jamie Garrett, Staff Attorney, at Jamie.Garrett@slc.ca.gov or (916) 574-0398. For questions concerning Commission leasing jurisdiction, please contact Kelly Connor, Public Land Management Specialist, at kelly.connor@slc.ca.gov or (916) 574-0343.

Sincerely,

Nicole Dobroski, Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
J. Garrett, Commission
K. Connor, Commission
C. Herzog, Commission

C-12 Comment noted. These comments constitute part of the Final IS/MND, and both the comments and responses/clarifications will be before the decision makers during adoption of the IS/MND and consideration of the project for approval. The final documents will comply with the American Disabilities Act and will be digitally accessible.

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Coastal Property Rights, Land Use & Litigation

June 3, 2022

Adriana Jaramishian
City of Del Mar
1050 Camino Del Mar
Del Mar, CA 92014

Re: Comments on the City of Del Mar's Camino Del Mar Bridge Replacement Draft Mitigated Negative Declaration

Dear Adriana,

D-1 On behalf of our clients, Andrew and Belinda Donner, we are providing the following comments, objections, and requested updates to the Draft Camino Del Mar Bridge Replacement Mitigated Negative Declaration ("MND"). The Donners' residence is located within the Sandy Lane community at 3004 Sandy Lane. The Donners' home is one of the closest residences to the project. Our comments are primarily directed to the Aesthetics and Noise sections of the MND.

D-2 The Donners' primary concern is the impact that the increased height of the bridge and the possible pedestrian overlooks would have on the peace and enjoyment of their property. The increased height appears to raise the level of the bridge to a point where the public will be able to look directly into the Donners' second-story living area (the Master bedroom and bathroom). Further, the proposed overlooks would serve to invite large groups of the public to congregate in a location close to and with a view directly into the Donners' home and backyard. Insufficient information has been provided to determine the extent of the project's impact on the Donners. The overlooks are identified as only possibly being included, and their exact location and dimensions are unclear.

D-3 The Donners request that the overlooks be excluded from the project for the reasons discussed below. Alternatively, the Donners request that design consideration be given to the impact on their home and the other homes in the Sandy Lane community. Alternative designs that should be considered include a single overlook located on the north end of the bridge, farther away from the Sandy Lane community. We also provide commentary and questions regarding the project's potential light, noise, and vibration impacts.

D-1 Because this comment is introductory in nature and provides background information pertaining to the commentor, no response is required. However, introductory comments regarding the Camino Del Mar Bridge Replacement IS/MND are noted, and specific comments are responded to individually below.

D-2 As found in Section 1.1 of the IS/MND, compared to the existing abutment elevations, the southern abutment would be raised from 16.99 feet to 19.75 feet (an increase of 2.76 feet); the northern abutment would be increased from 19.80 feet to 20.96 feet (an increase of 1.16 feet); and the mid span would be raised from 17.14 feet to 24.84 feet (an increase of 7.7 feet). The southern abutment, which is closest to the property located at 3004 Sandy Lane, would be raised only 2.76 feet from existing conditions. The area where the bridge would be raised 7.7 feet from existing conditions is located over 400 feet from the commentor's property. Specific to the bridge, viewers moving south along the existing facility already have views generally toward the home and its windows. The inclusion of a new viewing locale to support westerly views toward the beach and water is not expected to substantially change the existing condition in this highly traveled area. The public is anticipated to be already traversing the bridge, in a location

D-2 (cont.) similar to the sidewalk that currently exists on the north side of the bridge. The environmental documentation for the project addresses potential changes resulting from project implementation on the physical environment and public issues, consistent with the IS/MND Environmental Initial Study Checklist and CEQA Guidelines. A public view and visual comparison was performed of existing and proposed public views from the closest potential overlook location to the residence at 3004 Sandy Lane, as shown in Figure B, *Pedestrian Viewing Platform Overview Exhibit*, to this appendix. The existing condition photograph shows the view from the existing pedestrian walkway looking toward the residence from approximately 190 feet from the residential structure, the likely location of the southernmost viewing platform. The proposed condition photograph was taken approximately 7.5 feet higher than the existing pedestrian view to represent the increase in bridge height at that location. As shown, the change in views toward the residence is negligible.

D-3 Please see response to Comment D-2. As analyzed in the IS/MND, the public vista overlooks are an optional component of the project—the final number, location, and precise specifications will be determined by the City during its final design process. The Draft IS/MND evaluated the possible inclusion of public overlook(s) and determined that they would not be expected to substantially alter existing viewshed conditions and did not generate new or unavoidable significant environmental impacts, should they be included. Additionally, the visual exhibit presented in Figure B demonstrates that changes in public views from the closest potential overlook location to the Sandy Lane residences would be negligible. Please see the response to Comment D-2 for explanation regarding overlook use. Specific comments regarding the project's potential light, noise, and vibration impacts are responded to individually below.

Incomplete View Analysis

D-4 Key View 4, located in the Aesthetics Section of the MND, provides the most relevant perspective originating from near the Sandy Lane community. Notably, Key View 4 only provides a view *toward* the bridge (i.e., looking east), not *from* the bridge looking west towards the ocean or to the residences in the Sandy Lane community. Moreover, neither Key View 4 nor any other visual simulations include the possible overlooks, so their projected size and locations are undetermined.

D-5 This missing information is critical to understanding the full impact the project will have on the Sandy Lane community. Simulations should be provided from the bridge itself, looking in each direction, including toward the Sandy Lane community. The absence of such views only further highlights that the view analysis is incomplete from the perspective of any pedestrian user of the bridge.

D-6 Further, although Key View 4 appears to have accurately represented the bridge's overall height for sea-level rise, the post-project visual stimulation is visibly missing the critical users of the bridge – vehicles, and pedestrians. To be visually accurate, both vehicles and people must be represented as they are in the pre-project photo. The goal is to compare apples to apples, as with any view simulation analysis. As they are currently shown, the simulation is incomplete.

Pedestrian Overlooks

D-7 The MND mentions two potential pedestrian overlooks, approximately 237 square feet in size each. Given the increased height of the bridge, these overlooks may cause large groups of the public to gather near and with a direct view into the Donners' upstairs bedroom and bathroom, downstairs areas, and backyard. In addition, constructing the overlooks will undoubtedly add to the bridge's cost and risk creating an attractive nuisance that would invite members of the public to leap from the bridge into the water if it is located above or near the river mouth.

D-8 The MND states that overlooks "may be located on the west side of the bridge only, facing the Pacific Ocean." (MND at p. 2.) These potential overlooks are shown on the Proposed Bridge Typical Plan View and Elevation (Figure 4). Still, that figure does not appear to represent the overlooks to scale. The details of these overlooks are unclear in terms of their exact location and elevation, and they are not included in any of the simulated images.

D-9 Based on the information provided, the overlooks seem likely to be located near the highest elevation of the bridge, at least 7 feet higher than the current bridge height. The overlooks are proposed to be around 237 square feet each. Assuming a "loose crowd" of around 10 square feet per person, these overlooks would accommodate approximately 24 people each. This figure appears to be much larger than the schematic representation of the overlooks in Figure 4. The projected size and location of the overlooks raise a concern about inviting large public groups to gather in ways that will significantly impact the Donners' privacy. There may also be a safety risk in creating an attractive place for people to jump into the water. Further, if the southern

D-4 As required by the CEQA Guidelines, an aesthetics analysis was performed and addresses the potential impacts to public vistas based on changes to the project locale, and as such is generally focused on views from public vantage points. (See Sections 2.I(a) through 2.I(d) of the IS/MND.) The goal of the IS/MND visual simulations provided in the Draft IS/MND is to show what post-project conditions could look like from publicly accessible vantage points compared to existing conditions to fulfill the CEQA requirements related to evaluating potential adverse effects to a scenic vista, damage to scenic resources, and conflicts with applicable zoning and other regulations governing scenic quality. The Sandy Lane community is not part of the project, nor would it physically change from existing conditions as a result of this project. Please note that Key Views 1 and 4 both show the potential overlooks on the western side of the bridge. Please see Figures 13a and 13d for depictions of the potential overlooks, which accurately depict their relatively minimal visual effect.

D-5 Please see the response to Comment D-4. The IS/MND visual impact analysis identified the location of public viewsheds and evaluated the potential for the project to result in significant impacts to the viewing area. Therefore, the IS/MND analysis meets the requirements of CEQA regulations and Guidelines. The computer visual simulations clearly reflect changes to the public view settings that would result from the project. Additionally, please refer to the visual exhibit presented in Figure B for the anticipated change in public views from the closest potential overlook location to the Sandy Lane residences. The visual impact analysis found that impacts to private views would be negligible.

D-6 The visual simulation conducted for the Key View 4 location does contain cars on the left side of the image and depicts the bridge similarly to that shown under existing conditions at the time the photo was taken. It is acknowledged that the bridge often carries more vehicular, pedestrian, and bicycle traffic than shown. User volumes change throughout the day. Nonetheless, volumes on the bridge are not the subject of the IS/MND. This is because they are not expected to notably vary as bridge capacity

D-6 (cont.) would not increase as a result of its realignment. As a result, depictions of users on the bridge would not add to an understanding of potential impacts resulting from bridge construction. No revision is required.

D-7 The public lookouts, should they be constructed, would be located no closer than 150 feet from the commentor's private property. Viewer focus is expected to be along the coastline, San Dieguito River mouth, and the Pacific Ocean. Under the current environmental setting, public access would continue to be provided to the nearby beaches located north of the commentor's residence. These access points, along with public beach areas just north of the residence, currently provide greater visual access to the residence than points along the bridge to the north. Moreover, there is existing and proposed intervening vegetation in between the possible lookouts and the commentor's residence that would obscure public views to the private property. As found in the IS/MND, congregations of people would be negligible in comparison to existing conditions. Finally, there is no substantial evidence that would demonstrate that there will be an increase in members of the public jumping from the bridge onto the nearby beach/river mouth over that of existing conditions.

D-8 Should the pedestrian overlooks be constructed, they are to be at scale to existing bride conditions. The public viewing areas have been represented in Figure 4. (See also Figures 13a and 13d.)

D-9 Section 1.1 of the IS/MND provides specifics on elevational modifications associated with the proposed project. The proposed project has been designed and would be constructed in accordance with Caltrans standards and guidelines, including the American Association of State Highway Transportation Officials Load and Resistance Factor Design 8th Edition with Caltrans Amendments for the design of new bridges, adopted by Caltrans November 1, 2019. In addition to these criteria, the design of the bridge must comply with the project-specific design criteria that are approved by the City and the Project Design Team and the recommendations of Caltrans Memo to Designers that are relevant to the project. If they are included in the final project design, possible overlook locations are shown on Figure 4. Overlook locations were identified based on most structurally appropriate locations at the two

D-9 (cont.) central bridge columns. Based on the current bridge design, the southernmost overlook would be no closer than 150 feet from the subject property. The overlooks would be designed in accordance with the applicable design criteria noted above.

As noted in the response to Comment D-6, the overlooks would not cause a substantial increase in visitor or foot traffic compared to existing use of the bridge and beach areas. Please note that based on the CEQA Guidelines, impacts to private views are not considered an environmental impact. It is, however, important to note that the public viewing areas are not intended to serve as formal gathering spaces. For example, the public viewing areas will not contain features that would encourage public gatherings, such as there will be no shade or picnic facilities integrated into the public viewing areas. These public viewing areas are for transit viewing of the coastline.

D-9 cont. overlook is positioned above the beach instead of the water, it would be very close to the Donners' home.

D-10 The MND cannot be deemed complete because the proposed overlooks were not described, much less analyzed for their impacts. The MND should be based on a complete project description. Withholding the analysis of the overlooks would require an addendum to the MND should they be added to the final design. We request that a complete project description and corresponding analysis be provided in the final MND.

D-11 In summary, we object to the overlooks on behalf of the Donners due to safety, cost, and the potential negative impact on their privacy. More information needs to be provided. The overlooks should not be included in the final design. At a minimum, the overlooks should be reduced in number and size and located further from residences located in Sandy Lane. The design should be limited to a single overlook located at the bridge's north end, away from any residences if any overlook is included.

Potential Glare From Elevated Bridge Elevation

D-12 The MND projects that the new bridge would have the same traffic volume as the current two-lane bridge. However, no information or analysis is provided regarding the impact of the elevated level of the bridge on light pollution. The potential glare of the southbound travel lanes, elevated and angled differently with the new bridge, may point directly into the Donners' Master bedroom and other areas of the home. Further, there are no specifics as to the actual heights of the guide rails and their transparency. Unfortunately, we cannot know the new impact without analyzing these factors. We request that an analysis be provided of the impact of vehicles on the new elevation and curvature of the roadway on the bridge.

D-13 We note that there is no indication that new street lighting will be installed, so we do not address any potential concerns about street lighting.

D-14 However, another concern is the increase in lighting and associated glare generated during night-time construction activities. Although we understand that circumstances cannot prevent night-time construction altogether, the potential impact remains. Recognizing this and the overall sensitivity of the surrounding residential neighborhoods and natural ecosystem, we request that the City require that lighting will be directed downwards, shielded to the greatest extent feasible, and limited to the amount essential to perform the required work when crews are working in an area to perform work safely. A standard mitigation measure for this would be to develop a Construction Lighting Mitigation Plan. The plan should evaluate the need for stationary as well as portable lights. Balloon lights are preferred in all cases, as they produce less glare.

D-10 The proposed overlooks are included as an optional component of the project and analyzed accordingly. The public viewing areas are described in the IS/MND as follows: "Two pedestrian lookouts approximately 237 square feet in size may be located on the west side of the bridge only, facing towards the Pacific Ocean." As found in the IS/MND, the design description of the public viewing areas and related impacts complies with the mandates of CEQA and its Guidelines.

D-11 As noted above and as stated in the IS/MND, the public viewing areas are optional feature components of the project. The commentor's suggestion to have one public viewing area on the northern end of the bridge is noted and not a required analysis under the CEQA Guidelines.

D-12 As stated under Section 1.1 of the IS/MND, the proposed Camino Del Mar Bridge includes a striped median along its centerline and both northbound and southbound traffic lanes, as well as bike lanes. Each will be separated by a combination of either striped buffers or railings. Concrete curbs and metal hand railings would also line the eastern and western edges of the replacement bridge and would not be transparent. Please refer to the response to Comment D-2 regarding elevational changes associated with the proposed project. The roadway would be minimally sloped, with no substantial curvature. There is also intervening vegetation and a large tree in between the bridge and the commentor's property. It is also noted that the north-south alignment of the bridge is not changing, which means that direction of vehicular lights is not changing (see Figure 4, which depicts a new portion of the bridge overlaying the existing structure). The change that would occur is a maximum change in elevation of less than 8 feet along a facility that already provides sightlines to the side of the residence. Proposed modifications would not affect the portion of Camino del Mar north of the bridge, which has a southbound lane with more direct orientation to the home at increasing elevation.

D-13 Permanent lighting would be designed and constructed to the specifications described and analyzed in Section 2.I(d) of the IS/MND.

D-14 Section 2.I(d) of the IS/MND states that any temporary lighting would be required to be oriented downward (toward the bridge deck) and the lighting source would be required to be shielded in order to minimize light spillage. (See also IS/MND Section 2.IV(a).) Moreover, nighttime construction would be minimal. Therefore, the project does not require a construction lighting mitigation plan.

Requested Revisions to the Aesthetics Section of the Draft MND

D-15

For the foregoing reasons, we request that the City provide the following updates to the Aesthetics Section in the Final MND:

1. Confirm whether the City plans to construct the overlooks and provide details regarding their exact location, elevation, and size with to-scale diagrams and computer simulations. A complete project description and associated analysis must be provided.
2. Generate a new Key View from the perspective of pedestrians on the bridge and include an analysis of the impact of the overlooks on the Sandy Land residences.
3. Update with visually-accurate vehicles and pedestrians consistent with reality for Key View-4.
4. Provide an analysis of the potential glare impacts from cars on the proposed bridge, recognizing the raised elevation and changed curvature of the travel lanes. Include the design of protective measures such as guard rails or other means to contain glare attributed to headlights.
5. Provide a "Construction Lighting Mitigation Plan" consistent with Caltrans standards.

Mitigating Construction Impact Associated with Noise and Vibration

D-16

According to the MND, the Donners' home is approximately 265 feet from the project site and generally at the same elevation as the roadway. A six-foot-tall concrete wall is located between the Donners' home and the roadway, which currently provides attenuation from traffic noise based on the existing roadway elevation. However, with the bridge being raised coupled with unforeseen noises associated with this significant construction project, a noise barrier should be provided along the western edge during the construction phase, consistent with the barrier that is being proposed along the eastern edge.

D-17

According to the MND, vibration monitoring will be conducted at residential locations if a vibratory pile driver is used within 110 feet of residential dwellings. Although the Donners appreciate this precaution, they are concerned that this will not be sufficient based on experience with similarly scaled construction projects. Further, the Donners have concerns regarding risks created to the structural integrity of the Donner's home. For context, when nearby trains pass by, the vibrations can be felt at the Donners' home. According to page 70 of the MND, two residential dwellings would be within the distance of the vibratory pile driver. Vibration monitoring will be provided if the vibration level goes over certain limits. However, insufficient information has been provided to independently verify that adequate precautions will be put in place to protect the surrounding residences, including the Donners' home.

Requested Revisions to the Noise Section of the Draft MND

D-18

We request that the City provide the following updates to the Noise section in the Final MND:

1. Provide an additional noise barrier during construction along the western side of Camino Del Mar to protect Sandy Lane residences.
2. Provide a detailed mitigation plan that addresses the risk to the neighboring residences.

D-15 Please see Comments D-3 and D-8 above regarding the potential nature of the public viewing areas and IS/MND impact analysis, as well as the visual simulation shown in Figure 4 of the IS/MND. Comment D-4 addresses the potential public viewing areas shown in IS/MND Figures 13a and 13d. Please also see response to Comment D-6 regarding the lack of presence of members of the public; and see response to Comment D-14 as to why a construction lighting mitigation plan is not necessary for the proposed project. Further discussion is found in the responses to comments contained below.

All potential public viewing areas are addressed in the IS/MND and are depicted to scale in Figure 4. Figure 4 shows that these viewing areas are approximately 8 feet at the apex of the curve using sidewalk scaling. The bridge would vary in height from less than 1.2 to a maximum height of 7.7 feet in relation to the existing bridge structure, and any specific variation based on precise location would fall within this variance. The description provided in IS/MND Section 1.0 provides a complete analysis of potential significant environmental impacts.

Please see Figure B to these responses to comments, which shows the anticipated change in public views from the closest potential public viewing area location near the Sandy Lane residences. It is important to note that the installation of public viewing areas may increase bridge function by moving pedestrians who may currently pause to look at the westward views from the travel path along the bridge. It would enhance the existing viewing experience but would not open views to the public that do not currently exist.

As indicated from Google Earth review, where not obscured by existing vegetation, and frequently at distance, bridge users may obtain existing views toward the second story of the subject property. As described throughout the IS/MND, bridge improvements are not expected to change numbers of bridge users overall as bridge capacity would not be increased. Depictions of those users on the bridge when numbers are not expected to vary based on bridge construction (as here), would not add

D-15 (cont.) to an understanding of potential impacts resulting from bridge construction. Similarly, bridge construction is not expected to change the focus and direction of views to coastal amenities (i.e., beach, sand, water, bluffs). Regardless, control of viewers looking toward relatively distant windows of a small number of private uses does not comprise a CEQA-significant environmental impact and is beyond the purview of this environmental document.

As found in IS/MND Section 2.I(d), "Additional traffic loading in the project area is …not expected to result from the proposed improvements. As a result, substantial additional vehicle lights would not be expected, and no new substantial source of glare is anticipated." The slight project changes in elevation over a very short span relative to surround roads would not substantially change the amount of glare currently associated with those roads the vehicular volumes they carry. It is also noted that the north-south alignment of the bridge is not changing, which means that direction of vehicular lights is not changing (see Figure 4, which depicts a new portion of the bridge overlaying the existing feature). Please refer to the responses to Comments D-2 and D-12 that relate to bridge design and lack of transparency of guard rails, as well as the roadway portion that provides direct lines of sight to the structure, which are not being modified. Because of the lack of glare there are no additional design features required.

D-16 The barrier that is being provided on the eastern edge of the project site is not to attenuate for construction noise but for traffic noise. The noise levels measured and modeled for construction would not exceed appliable City and Caltrans standards. At the Receiver R-3, which is located directly in front of the commentor's property line, the noise levels would not exceed applicable standards, nor would it increase from existing conditions. Additionally, a six-foot-high noise barrier already exists in front of the commentor's residence.

D-17 Please note that the IS/MND assumed the use of vibratory pile driving equipment as an optional construction method. The use of vibratory hammers was conservatively included in the IS/MND analysis, but may not be used during construction of the bridge. Analysis was included to provide a conservative (worst-case) assessment relative to vibration, but if the CIDH construction is used as indicated on Figure 5 of this Final

D-17 (cont.) IS/MND, the issue of vibration associated with pile driving would be moot. Nonetheless, if used, pile driving equipment would be deployed at a distance greater than 100 feet away from the commentor's residential foundation. The commentor's personal experience with vibration is noted.

Moreover, mitigation measure NOI-3 requires that: "If a vibratory pile driver is used within 110 feet of a residential dwellings, vibration monitoring shall be conducted at the residential locations. If the measured vibration level exceeds … criteria for steady state sources, the power level of the pile driver shall be reduced or vibration shielding via a trench or alternative method shall be implemented to reduce vibration levels below the 0.1-inch per second PPV level." In other words, if project-related construction vibration exceeds the state-identified threshold, mandatory reduction in power or introduction of shielding would take place, thereby reducing the vibration to levels considered acceptable annoyance levels for temporary construction activities. Monitoring would take place outside the residence as close to the structure as possible following property-owner approval. The mitigation measure has been incorporated into the Mitigation Monitoring and Reporting Program (Appendix L to this Final IS/MND), which is designed to ensure that the mitigation measures are in fact implemented as required. This provides independent verification that the measure(s) have been appropriately implemented during construction and that no structural issues occur to nearby residences.

D-18 Please see the responses to Comments D-16 and D-17 regarding additional barrier and mitigation plan that have been considered but found not to be necessary.

Incomplete Project Description

D-19 We believe that the City has provided an incomplete project description by leaving out critical information in both the project description and the related potential mitigation measures. More specifically, leaving out the potential pedestrian outlooks and details of where and how the vibration monitoring will occur. The lack of analysis of the anticipated glare from elevated vehicle headlights further presents an incomplete picture from which to evaluate the project.

D-20 Thank you for reviewing the above comments, objections, and requested revisions to the Aesthetics and Noise sections of the Draft MND. Should you have any questions regarding this letter, please do not hesitate to contact me.

Sincerely,

AANNESTAD ANDELIN & CORN LLP

Anders T. Aannestad

cc: Andrew and Belinda Donner
Chandra Slaven

D-19 Comment noted. Please see the responses to Comments D-3, D-4, D-7 through D- 11, and D-15 relative to the potential overlook; D-17 regarding vibration monitoring; and D-12 and the last paragraph of D-15 relative to glare. The project description, analyses, and mitigation discussed in the IS/MND provide adequate disclosure under CEQA.

D-20 This is a closing comment and does not address adequacy of the CEQA IS/MND. No response is required.

Adriana Jaramishian

From: KEVIN GROLD <grold@aol.com>
Sent: Tuesday, May 17, 2022 11:41 AM
To: Adriana Jaramishian
Subject: Del Mar bridge dog Beach

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

E-1 I think there should be sitting areas over the water on both sides of the bridge. It would be the crown jewel of Del Mar.

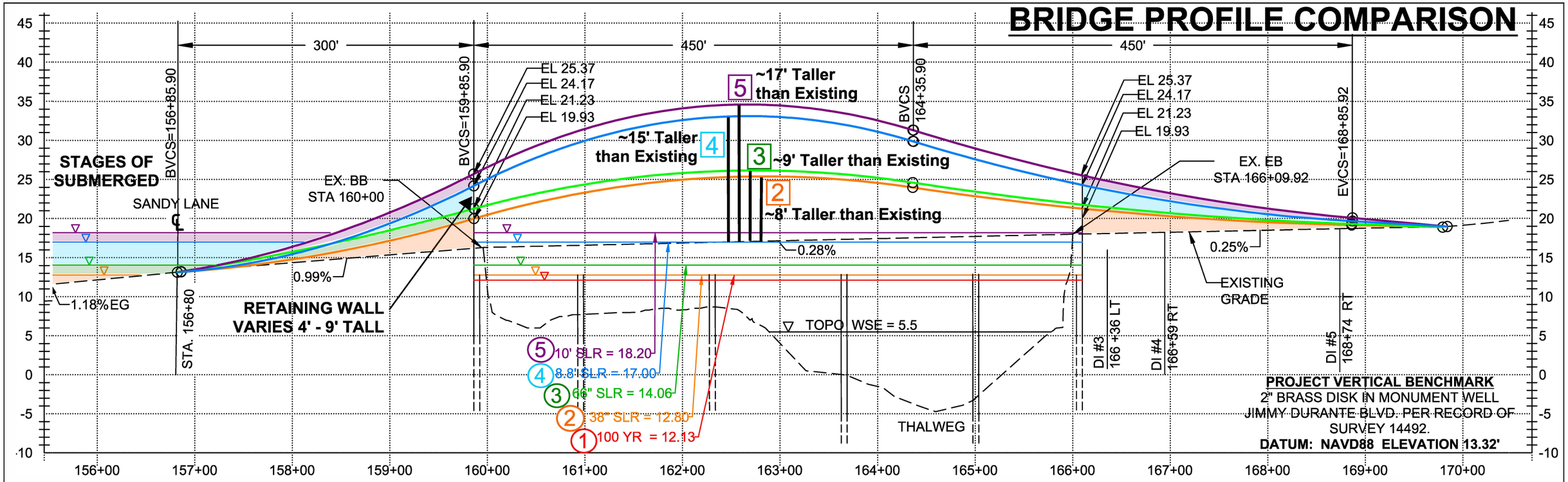
Thanks for taking my input.

Dr. Kevin Grold
Del Mar
858-922-2396

1

E-1 Two public viewing areas of approximately 237 square feet may be located on the west side of the bridge and would face towards the Pacific Ocean. Public viewing areas located on the east side of the bridge will not be considered at this time.

BRIDGE PROFILE COMPARISON



	Bridge Number	Control Elevation	Approximates Sea Level Rise	Abutment Retaining Wall Height	Taller than Existing near Midspan	Rough Order of Magnitude Cost	Rough Cost Increase (from cheapest)	PROS AND CONS	DISPOSITION	
5	Bridge 5	18.20	10' SLR	9'	17'	$27,500,000	$2,500,000	SUBMERGED CONDITION (UNDERWATER) BRIDGE TOO TALL / RETAINING WALLS TOO HIGH UNNECESSARILY EXPENSIVE	NOT RECOMMENDED	X
4	Bridge 4	17.00	8.8' SLR	8'	15'	$27,000,000	$2,000,000	SUBMERGED CONDITION (UNDERWATER) BRIDGE TOO TALL / RETAINING WALLS TOO HIGH UNNECESSARILY EXPENSIVE	NOT RECOMMENDED	X
3	Bridge 3	14.06	66" SLR	5'	9'	$25,500,000	$500,000	SIGNIFICANTLY SUBMERGED CONDITION SUBMERGED CONDTION DOESN'T WARRANT ADDITIONAL COST	NOT RECOMMENDED	X
2	Bridge 2	12.80	38" SLR	4'	8'	$25,000,000	$0	BEACH COLONY BASIN ALREADY PARTIALLY SUBMERGED BEFORE BRIDGE EFFECTS RIVER HYDRAULICS CLEARS 38" SEA LEVEL RISE LOWEST COST	PREFERRED ALTERNATIVE	✓
1	Existing Bridge	12.13	100-YR FLOOD	0'	0'	$0	-	DOES NOT CLEAR 100-YR FLOOD DOES NOT ACCOUNT FOR ANY SEA LEVEL RISE	NOT RECOMMENDED	X

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: D. BLOODWORTH | DRAWN: J. MANINANG | CHECKED: D. BLOODWORTH
ENGINEER OF WORK | R.C.E. NO. | DATE

KLEINFELDER
Bright People. Right Solutions.
550 WEST C STREET, SUITE 1200 SAN DIEGO, CA 92101 (619) 831-4600

DRAFT

APPROVED
PUBLIC WORKS DIRECTOR | DATE

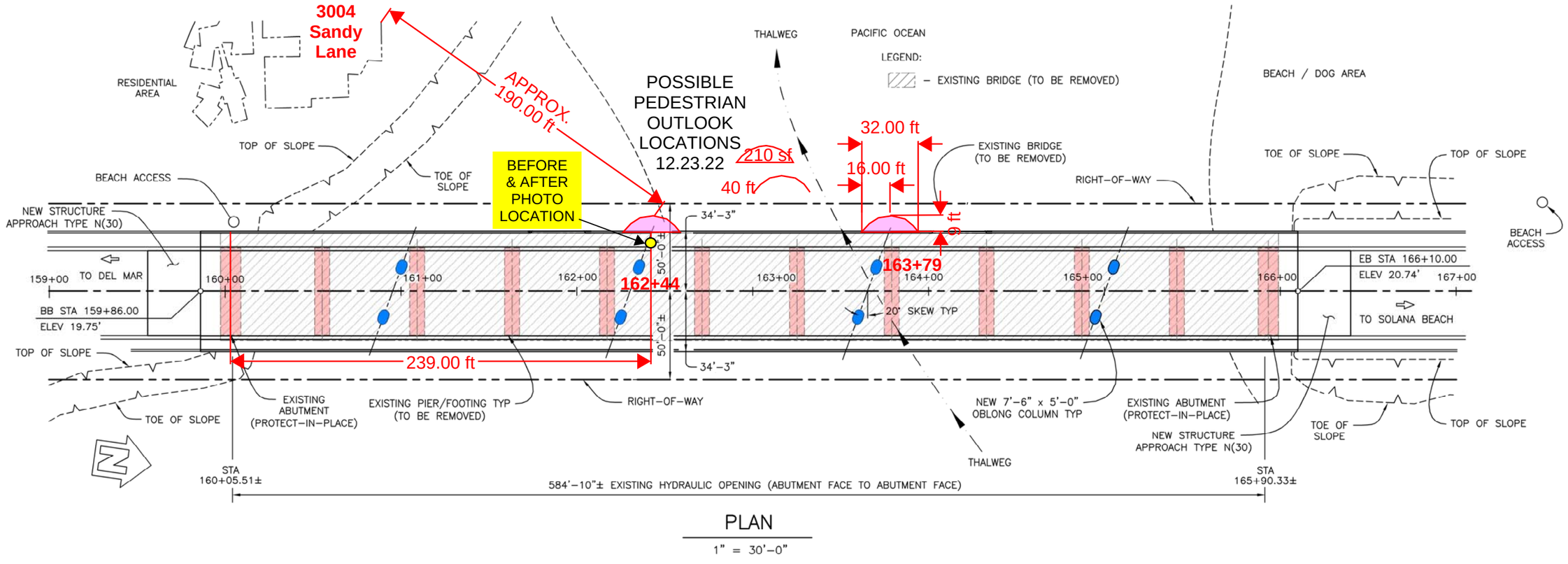
CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
APPENDIX K - FIGURE A, BRIDGE PROFILE COMPARISON

A-01

PHOTOGRAPHIC METHODS

PHOTO REPRESENTING EXISTING CONDITION
TAKEN FROM A POSITION 239-FEET FROM
EXISTING SOUTHERLY ABUTMENT (STA 162+44).

PHOTO REPRESENTING PROPOSED CONDITION
TAKEN FROM A POSITION 239-FEET FROM
EXISTING SOUTHERLY ABUTMENT (STA 162+44).



PLAN

1" = 30'–0"

ALTERNATIVE 1.1: 5-SPAN VARIABLE DEPTH CAST-IN-PLACE PRESTRESSED CONCRETE BOX GIRDER BRIDGE WITH TWO COLUMNS PER PIER

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH

ENGINEER OF WORK R.C.E. NO. DATE

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DRAFT

APPROVED
PUBLIC WORKS DIRECTOR DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
APPENDIX K - FIGURE B, PEDESTRIAN VIEWING PLATFORM VISUAL EXHIBIT

B-01

ORIGINAL SCALE: 11 INCHES x 17 INCHES



PHOTO REPRESENTING EXISTING CONDITION TAKEN FROM A POSITION 239-FEET FROM EXISTING SOUTHERLY ABUTMENT (STA 162+44) FACING 3004 SANDY LANE WHILE STANDING ON EXISTING PEDESTRIAN WALKWAY.



PHOTO REPRESENTING PROPOSED CONDITION TAKEN FROM A POSITION 239-FEET FROM EXISTING SOUTHERLY ABUTMENT (STA 162+44) FACING 3004 SANDY LANE WITH CAMERA ELEVATION APPROX. 7.5-FOOT HIGHER THAN WHILE STANDING ON EXISTING PEDESTRIAN WALKWAY.

PHOTOGRAPHIC METHODS

PHOTOS TAKEN APPROX. BETWEEN 10:30AM - 11:00AM ON FRIDAY 12/23/22.

REVISION	DESCRIPTION	APPROVED	DATE

SCALE: AS SHOWN
ACAD FILE NO.
PROJECT NO.

DESIGNED: N. VU | DRAWN: T. BRITTAIN | CHECKED: D. BLOODWORTH
ENGINEER OF WORK R.C.E. NO. DATE

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DRAFT

APPROVED
PUBLIC WORKS DIRECTOR DATE

CITY OF DEL MAR
CAMINO DEL MAR BRIDGE OVER SAN DIEGUITO RIVER
APPENDIX K - FIGURE B, PEDESTRIAN VIEWING PLATFORM VISUAL EXHIBIT

B-02

ORIGINAL SCALE: 0 1 2 INCHES

Appendix L

Mitigation Monitoring and Reporting Program

Appendix L
Mitigation Monitoring and Reporting Program

CEQA Section 21081.6 requires that a Mitigation Monitoring and Reporting Program (MMRP) be adopted along with a Mitigated Negative Declaration (MND) to ensure that proposed mitigation measures are implemented. The MMRP must specify what the mitigation measure requires, the entity responsible for monitoring the program, and when in the process it should be implemented. Table L-1 lists the mitigation measures identified in the analysis of this MND that would be required as part of the proposed project. Table L-2 identifies the Project Design Features and Best Management Practices (BMPs) to be implemented as part of the proposed project.

Table L-1
Mitigation Monitoring and Reporting Program

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
Aesthetics				
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	**AES-1: Mitigation for Loss of Trees.** Mitigation for loss of trees within the Camino del Mar public road right-of-way shall be covered by the City's Public Tree/Landscape Management program as administered by the City of Del Mar Public Works Department. Existing credits that have been added to the Program via Capital Improvement Program projects shall be applied to the project to ensure compliance with Chapter 23.50 of the DMMC.	Prior to construction	Proof of application of mitigation credits	City of Del Mar Planning Division
Biological Resources				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	**BIO-1: Pre-construction Protocol Surveys and Listed Species Avoidance**. In preparation for construction and to confirm the presence or absence of Belding's savannah sparrow, a pre-construction survey shall be conducted one year prior to construction during the breeding season (March 15 to June 30). If Belding's savannah sparrow is detected within 300 feet of the project impact footprint, the City shall notify CDFW, and if required by CDFW, shall prepare and submit an application for a Section 2081(b) Incidental Take Permit for impacts to Belding's savannah sparrow prior to construction. If it is determined by the survey that active territories for Belding's savannah sparrow are absent within 300 feet of construction, then construction shall be allowed to proceed. If results of the pre-construction survey discussed above conclude Belding's savannah sparrow is absent, a subsequent survey shall be conducted prior to work if construction is	Prior to construction During construction, March 15 to June 30	Retention of a qualified biologist. Proof of completion of focused protocol surveys by a qualified biologist. If Belding's savannah sparrow is detected within the project impact footprint during pre-construction surveys, the City shall notify CDFW, and prepare and submit an application for a Section 2081(b) Incidental Take Permit.	City of Del Mar Planning Division

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
	scheduled to commence between March 15 and June 30 (i.e., breeding season for Belding's savannah sparrow) to ensure the absence of this species. If this subsequent survey finds active nesting territories belonging to this species, then construction shall: (1) be postponed until a qualified biologist determines the nest(s) is no longer active or until after the respective breeding season; (2) not occur until a temporary noise barrier or berm is constructed at the edge of the development footprint and/or around construction equipment to the satisfaction of the project biologist; and/or (3) shall be postponed until consultation with CDFW to address protection of this species has been completed by the City.			
	BIO-2: Construction Noise Abatement. If noise-generating construction activities are not completed prior to the breeding season for Belding's savannah sparrow (March 15 through June 30) and this species is found present during the pre-construction surveys completed in accordance with BIO-1, then appropriate noise attenuation measures shall be implemented to reduce construction noise levels at the edge of occupied habitat to below 60 dBA LEQ (one hour average). Such measures shall include, but not be limited to, the following: • Construction equipment shall be properly outfitted and maintained with manufacturer- recommended noise-reduction devices. • Diesel equipment shall be operated with closed engine doors and equipped with factory- recommended mufflers. • Mobile or fixed "package" equipment (e.g., arc-welders and air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment. • Electrically powered equipment shall be used instead of pneumatic or internal-combustion powered equipment, where feasible. • Unnecessary idling of internal combustion engines (e.g., in excess of 5 minutes) shall be prohibited.	During construction, February 15 through June 30	Proof of implementation of appropriate noise attenuation measures.	City of Del Mar Planning Division

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
	• The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only. • No project-related public address or music system shall be audible at any adjacent sensitive receptor. • Temporary sound barriers or sound blankets shall be installed between construction operations and adjacent noise-sensitive habitat. The project Contractor shall construct a temporary noise barrier at least 6 feet in height meeting the specifications listed below (or of a Sound Transmission Class 19 rating or better) to attenuate noise. • All barriers shall be solid and constructed of wood, plastic, fiberglass, steel, masonry, or a combination of those materials, with no cracks or gaps through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove or close butted seams and must be at least 3⁄4-inch thick or have a surface density of at least 3.5 pounds per square-foot. Sheet metal of 18-gauge (minimum) may be used if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Noise blankets, hoods, or covers also may be used, provided they are appropriately implemented to provide the required sound attenuation.			
	BIO-3: Nesting Bird and Raptor Avoidance. In order to avoid violation of the federal MBTA and California Fish and Game Code, site-preparation activities (removal of trees and vegetation) shall be avoided during the general avian breeding season (January 15 to July 30 for raptors; February 15 to September 30 for other avian species). If site-preparation activities are to occur during the general avian or raptor breeding season, a pre-construction nesting survey shall be conducted within three days prior to the commencement of construction. A qualified biologist shall perform the nesting survey to ascertain whether there are active raptor nests or sensitive avian species nesting within	Prior to construction During construction, January 15 to July 30 for raptors; February 15 to September 30 for other avian species	Retention of a qualified biologist. Proof of completion of pre-construction nesting bird and raptor surveys by a qualified biologist. If nesting birds present, biological monitor to provide proof of compliance with buffer area for duration of construction	City of Del Mar Planning Division

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
	500 feet of the project footprint and/or other bird nests within 300 feet of the project footprint. This survey shall identify the species of nesting bird and to the degree feasible, nesting stage (e.g., incubation of eggs, feeding of young, near fledging). Nests shall be mapped (not by using GPS because close encroachment may cause nest abandonment). If the surveys conclude no active nesting, the work shall resume as planned. If project activities are delayed or suspended for more than five days during the breeding season, surveys shall be repeated prior to re-initiating work. If an active nest is observed, the nest location shall be fenced off surrounding an adequate radius buffer zone as determined by biological monitor. Buffer distances may include, but shall not be restricted to, 100 feet around non-listed active passerine (e.g., perching birds and songbirds) nests and 300 feet around listed passerine (e.g., Belding's savannah sparrow) nests. The buffers may be reduced, if appropriate, and as directed by a qualified biologist. The reduction in no-work buffers shall be approved by the City prior to implementation. Each nest avoidance buffer zone shall not be disturbed until a qualified biologist has verified that the young have fledged or the nest has otherwise become inactive.		activities while nest is active.	
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	**BIO-4: Habitat Restoration Plan.** The City shall prepare and implement a habitat restoration plan. Temporary impacts to 0.02 acre of Diegan coastal sage scrub shall be restored to a pre-construction or superior condition at a 1:1 replacement within the area impacted. Permanent impacts to 0.16 acre of Diegan coastal sage scrub shall be mitigated at a 2:1 ratio. Mitigation shall occur through on- or off-site restoration, enhancement, and/or establishment with a minimum 1:1 establishment component, or the purchase of credits at an approved mitigation bank. Mitigation may occur on- or off-site by converting habitat that has been mapped as disturbed, non-native vegetation, and/or ornamental into native habitat. The habitat restoration plan shall be submitted to CDFW for review and concurrence prior to ground disturbance that may impact Diegan coastal	Prior to construction, during construction, post construction	Proof of creation and implementation of Habitat Restoration plan	City of Del Mar Planning Division

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
	sage scrub. The habitat restoration plan shall be submitted to CDFW for review and concurrence prior to ground disturbance that may impact Diegan coastal sage scrub. Mitigation located outside of the Coastal Zone shall require approval by the City and CCC, as well as other applicable agencies such as the CDFW.			
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	**BIO-5: Regulatory Permits.** Prior to project impacts to potentially jurisdictional resources, demonstration that regulatory permits from USACE, RWQCB, CDFW, and CCC, have been issued or that no such permits are required shall be provided to the City. Implementation of permit requirements, including additional mitigation, shall be required.	Prior to construction	Retention of a qualified and permitted biologist. Proof of avoidance on a site plan, or proof of required permits from applicable state and regulatory agencies.	City of Del Mar, USACE, RWQCB, CDFW, and CCC
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	**BIO-6: Eelgrass Avoidance and Mitigation.** A pre-construction eelgrass survey shall be conducted in accordance with NOAA Fisheries California Eelgrass Mitigation Policy and Implementation Guidelines. If the pre-construction survey demonstrates eelgrass presence within the 100 feet of the construction footprint, then a mitigation plan to achieve no net loss in eelgrass function shall be developed and conducted in accordance with the California Eelgrass Mitigation Policy and Implementation Guidelines. The mitigation plan shall be reviewed and approved in consultation with NOAA Fisheries prior to project impacts to eelgrass. Mitigation options include (1) development of comprehensive management plans that protect eelgrass resources within the context of broader ecosystem needs and management objectives; (2) in-kind compensatory mitigation (e.g., creation, restoration, or enhancement of the same habitat type to mitigate for adverse impacts) that achieves a minimum final mitigation ratio of 1.38:1 once mitigation is complete (3) credits purchased through a mitigation bank or in-lieu fee program at a 1:1 ratio where the credits have been established for a full three-year period prior to use (or higher ratio should the bank credits have been in place for a period less than three years); (4) out-of-kind compensatory mitigation (e.g., creation, restoration, or enhancement of	Prior to construction	Retention of a qualified and permitted biologist. If eelgrass is present, proof of mitigation plan to achieve no net loss. Proof of NOAA approval of mitigation plan.	City of Del Mar Planning Division, NOAA Fisheries

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
	another habitat type to mitigate for adverse impacts) that demonstrates to the satisfaction of NOAA Fisheries such that it can be demonstrated that the proposed mitigation will compensate for the loss of eelgrass habitat function within the ecosystem; or (5) alternate mitigation recommendations provided by NOAA Fisheries that will achieve no net loss.			
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	**See MM AES-1 and BIO-5.**	See MM AES-1 and BIO-5.	See MM AES-1 and BIO-5.	See MM AES-1 and BIO-5.
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	**See MM BIO-1 through BIO-6.**	See MM BIO-1 through BIO-6.	See MM BIO-1 through BIO-6.	See MM BIO-1 through BIO-6.
Cultural Resources				
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	**CUL-1: Cultural Resource Monitoring**. A qualified archaeologist meeting the United States Secretary of the Interior's Professional Qualifications for prehistoric and historic archaeology and a Kumeyaay Native American monitor shall be retained to conduct a cultural resource monitoring program. The monitoring program shall include attendance by the archaeologist and Native American monitor at a pre-construction meeting with the construction contractor and the presence of an archaeological and Native American monitor during initial ground disturbance for the project. If it is determined by the archaeologist and Native American monitor that past grading and other disturbances have removed soils with a reasonable potential for containing cultural material, monitoring can be reduced and recommence when the ground-disturbing activities continue in native soil. If cultural material is encountered, the archaeologist and the Native American monitor shall have the authority to temporarily halt or redirect ground-disturbing activities while the cultural material is documented and assessed. If a cultural resource is determined to be significant, the	Prior to construction, during construction, post construction	Retention of a qualified archaeologist and Native American monitor. Documentation of monitoring program by qualified archaeologist and Native American monitor. If any artifacts collected, proof they have been cataloged, analyzed, and curated with accompanying catalog to current professional repository standards and transferred to an appropriate curating	City of Del Mar Planning Division

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
	archaeologist and Native American monitor shall coordinate with the City staff to develop and implement appropriate treatment measures. Artifacts collected (if any) shall be cataloged, analyzed, and curated with accompanying catalog to current professional repository standards and transferred to an appropriate curating facility within San Diego County. Alternatively, artifacts may be returned to the consulting tribe for reburial or for curation at a tribal facility. A report shall be completed by the qualified archaeologist describing the methods and results of the monitoring program. The final disposition of archaeological, historical, and paleontological resources recovered on State land under the jurisdiction of the California State Lands Commission must be approved by the California State Lands Commission.		facility within San Diego County.	
Geology and Soils				
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	**GEO-1: Paleontological Resources Monitoring and Treatment Plan.** Prior to the start of any ground-disturbing activity, a Paleontological Resources Monitoring and Treatment Plan (PRMTP) shall be prepared by a qualified paleontologist, subject to review and approval by the City of Del Mar. The PRMTP shall address construction monitoring procedures and provide treatment measures for paleontological resources discoveries, including the development of protocols for handling fossils discovered during construction, likely including temporary diversion of construction equipment so that the fossils could be recovered, identified, and prepared for dating, interpreting, and preserving at an established, permanent, accredited research facility.	Prior to construction	Retention of a qualified Paleontologist Proof of approval and implementation of a PRMTP	City of Del Mar Planning Division
	GEO-2: Paleontological Monitoring Program. Prior to the start of any ground-disturbing activity, a qualified paleontologist shall attend the pre-construction meeting to consult with the grading and excavation contractors concerning excavation schedules, paleontological field techniques, and safety issues. A paleontological monitor shall be on site on a full-time basis during the original cutting of previously undisturbed deposits of high paleontological resource potential (Bay Point Formation and Delmar Formation) to inspect exposures for contained fossils. Grading	Prior to construction, during construction, post construction	Retention of a qualified Paleontologist Proof of Paleontologist attendance at the pre-construction meeting Documentation of monitoring program	City of Del Mar Planning Division

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
	activities in previously undisturbed deposits of moderate paleontological resource potential (Torrey Sandstone) shall be monitored on a part-time basis. In the event that paleontological resources are discovered or unearthed during project subsurface activities, all earthmoving activities within radius of not less than 50 feet from the discovery shall be temporarily suspended or redirected until a certified paleontologist has recovered, identified, and/or evaluated the nature and significance of the find, in compliance with CEQA Guidelines 15064.5(f). After the find has been appropriately mitigated, work in the area may resume. Any fossil remains collected during monitoring and salvage shall be cleaned, repaired, sorted, and cataloged as part of the monitoring program. Prepared fossils, along with copies of all pertinent field notes, photos, and maps, shall be deposited in a scientific institution with permanent paleontological collections such as the San Diego Natural History Museum. Donation of the fossils shall be accompanied by financial support for preparation, curation, and initial specimen storage, if this work has not already been completed. A final summary report shall be completed that outlines the results of the paleontological monitoring program. This report shall include discussions of the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils.		by qualified Paleontologist In the event that paleontological resources are discovered during project, all earthmoving activities within radius of not less than 50 feet from the discovery shall be temporarily suspended or redirected until a certified paleontologist has recovered, identified, and/or evaluated the nature and significance of the find.	
Hazards and Hazardous Materials				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	**HAZ-1: Polychlorinated Biphenyl (PCB) Mitigation.** Should removal of pole-mounted transformers be required as part of the project, the local utility company shall be notified for proper testing and removal. If such removal is required, a survey shall be conducted prior to demolition to determine the presence or absence of PCBs in applicable power pole transformers. These surveys shall be conducted by qualified/certified personnel, such as federal- and/or state-certified inspectors/assessors. Evidence of survey completion shall consist of a signed and stamped statement submitted to the City from the person certified to complete the	Prior to construction, during construction	If removal of pole-mounted transformers is required, retention of qualified/certified personnel, such as federal- and/or state-certified inspectors/ assessors. Proof of survey completion	City of Del Mar Planning Division

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
	facility survey, indicating that the survey has been completed and that either regulated PCBs are present or absent. If regulated PCBs are present, all related handling and disposal shall be conducted pursuant to applicable federal (e.g., 40 CFR Part 761) and state (e.g., Title 22). Verification that the specified procedures were followed shall be provided to the City.		submitted to the City.	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	**HAZ-2: Asbestos Containing Materials (ACM) Survey.** An ACM survey shall be conducted by a qualified individual in conformance with NESHAP 40 Code of Federal Regulation (CFR) Part 61, Subpart M, and San Diego County Air Pollution Control District (SDCAPCD) Rule 1206, prior to the start of construction. Evidence of survey completion shall consist of a signed and stamped statement submitted to the City from the person certified to complete the facility survey, indicating that the survey has been completed and that either regulated asbestos is present or absent. If regulated ACMs are present, the statement shall describe the procedures that will be taken to remediate the hazard, including applicable regulations for demolition methods and dust suppression SDAPCD Rule 1206, and proper handling and disposal under CCR Title 22, Division 4.5. Verification that the specified procedures were followed shall be provided to the City.	Prior to construction	Retention of a qualified individual in conformance with NESHAP 40 Code of Federal Regulation (CFR) Part 61, Subpart M, and San Diego County Air Pollution Control District (SDCAPCD) Rule 1206. Proof of survey completion submitted to the City. If ACMs are present, proof of creation and implementation of procedures taken to remediate the hazard.	City of Del Mar Planning Division
	HAZ-3 Lead Based Paint (LBP) Survey. An LBP survey shall be conducted by a qualified individual in accordance with CDPH guidelines, prior to the start of construction. Evidence of survey completion shall consist of a signed and stamped statement submitted to the City from the person certified to complete the facility survey, indicating that the survey has been completed and that either regulated LBP is present or absent. Lead containing materials shall be managed in accordance with applicable regulations including, at a minimum, the hazardous waste disposal requirements (CCR Title 22, Division 4.5); and the State Lead Accreditation, Certification and Work Practice Requirements (CCR Title 17, Division 1, Chapter 8). Verification that the specified procedures were followed shall be provided to the City.	Prior to construction	Retention of a qualified individual in accordance with CDPH guidelines. Proof of survey completion submitted to the City. If LBP is present, materials shall be managed in accordance with applicable regulations.	City of Del Mar Planning Division

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
Noise				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	**NOI-1: Construction Noise Management Plan.** Prior to the initiation of construction activities, a Construction Noise Management Plan shall be prepared that identifies measures to comply with the following: 1. The construction contractor shall be required to work in such a manner so as not to exceed a 1 hour average sound level of 75 dBA at any noise-sensitive land use (residential). Sound levels may be limited by sound control devices, limiting the number of equipment operating at once, or installation of temporary noise barriers between the construction site and sensitive receptors. 2. Construction equipment shall be properly outfitted and maintained with manufacturer recommended noise-reduction devices to minimize construction-generated noise. 3. Stationary construction noise sources such as generators or pumps shall be located at least 100 feet from noise-sensitive land uses. 4. Laydown and construction vehicle staging areas shall be located as far from noise-sensitive land uses as feasible.	Prior to construction	Proof of creation and implementation of Construction Noise Management Plan.	City of Del Mar Planning Division
	NOI-2: Exterior Use Area Noise Barrier. To reduce traffic noise levels at exterior use areas where Caltrans and City noise standards would be exceeded, either a six-foot-high, 87-foot-long noise barrier, or a seven-foot-high, 59-foot-long noise barrier shall be provided along the fence line of the exterior use area of NSLU R-5. Both are shown on Figure 21. The noise barrier must be solid. It can be constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, as long as there are no cracks or gaps, through or below the barrier. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least one-inch total thickness or have a density of at least 3.5 pounds per square foot. Where architectural or aesthetic factors allow, glass or clear plastic 3/8 of an inch thick or thicker may be used, if it is desirable to preserve a view. Sheet metal of 18-gauge (minimum) may be used if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or	Prior to construction	Installation of noise barrier.	City of Del Mar Planning Division

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
	wind. Any door(s) or gate(s) must be designed with overlapping closures on the bottom and sides and meet the minimum specifications of the materials described above. The gate(s) may be of wood with a thickness of at least one inch, solid-sheet metal of at least 18-gauge metal, or an exterior-grade solid-core steel door with prefabricated door jambs.			
b) Generation of excessive groundborne vibration or groundborne noise levels?	**NOI-3 Vibratory Pile Driver Vibration Monitoring and Reduction.** If a vibratory pile driver is used within 110 feet of a residential dwellings, vibration monitoring shall be conducted at the residential locations. If the measured vibration level exceeds Caltrans' 0.1-inch per second PPV strongly perceptible annoyance potential criteria for steady state sources, the power level of the pile driver shall be reduced or vibration shielding via a trench or alternative method shall be implemented to reduce vibration levels below the 0.1-inch per second PPV level.	During construction	Retention of a qualified noise monitor. If vibration levels exceed Caltrans' 0.1-inch per second PPV strongly perceptible annoyance potential criteria, vibration shielding or an alternative reduction method shall be used.	City of Del Mar Planning Division
Tribal Cultural Resources				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i. Listed or eligible for listing in the California Register of Historical	**See MM CUL-1.**	See MM CUL-1.	See MM CUL-1.	See MM CUL-1.

Significant Impact	Mitigation Measure	Timing	Action Indicating Compliance	Responsible Entity
Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.				
Mandatory Findings of Significance				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining	**See MM BIO-1 through BIO-6 and CUL-1.**	See MM BIO-1 through BIO-6 and CUL-1.	See MM BIO-1 through BIO-6 and CUL-1.	See MM BIO-1 through BIO-6 and CUL-

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levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present and probable future projects)?	**See MM BIO-1 through BIO-5, CUL-1, GEO-1 and GEO-2, and HAZ-1 through HAZ-3**	See MM BIO-1 through BIO-5, CUL-1, GEO-1 and GEO-2, and HAZ-1 through HAZ-3	See MM BIO-1 through BIO-5, CUL-1, GEO-1 and GEO-2, and HAZ-1 through HAZ-3	See MM BIO-1 through BIO-5, CUL-1, GEO-1 and GEO-2, and HAZ-1 through HAZ-3
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	**See MM NOI-1 and NOI-2**	See MM NOI-1 and NOI-2	See MM NOI-1 and NOI-2	See MM NOI-1 and NOI-2

Table L-2
Project Design Features and Best Management Practices

Project Design Feature or Best Management Practice	Timing	Action Indicating Compliance	Responsible Entity
Implement measures to control sediment and erosion during construction. Such measures may include, but are not limited to: (1) installing erosion and sediment control devices such as silt fences, fiber rolls, mulching or soil binders, plastic covers, and gravel bags in appropriate locations; (2) placing temporary filters at storm drain inlets (e.g., gravel bags/filter fabric); (3) designating containment areas for material storage (e.g., covering/berming of soil stockpiles); (4) providing containment areas for solid waste storage and concrete washout; (5) construction of temporary berms; (6) limiting fueling/maintenance of equipment to designated areas outside and away from waters or wetlands areas; and (7) installing material containment devices for refueling or fixing equipment that is not easily movable away from waters.	Measures to be included in construction documents for approval by City. Measures to be implemented during construction, prior to activities that may result in sedimentation and/or erosion.	Review and approval of construction documents by City. Proof of implementation of appropriate measures.	City of Del Mar Planning Division, Engineering Department Construction Contractor
Implement construction commitments and operating procedures for "in-water" work within the San Dieguito River mouth. Such procedures may include, but are not limited to: (1) installing impermeable barriers or turbidity curtains; (2) installing exclusionary fencing to exclude grunion entry into the project work areas between September 1 and February 28; (3) using temporary cofferdams or temporary berms where practicable; (4) employing air bubble curtain technologies or cushion block devices on the pile-driving, hammering, and drilling machinery to reduce vibrations, hydroacoustic, and channel bottom disturbances; (5) limiting the use of hammer-style or pile driver machinery; (6) wrapping pile and hammer drivers with sound blankets; (7) installing vibratory dampeners on driver/hammer heads, where feasible; (8) using electrically powered equipment instead of pneumatic or internal-combustion powered equipment; and (9) scheduling construction within water and wetlands to occur during low tides. Measures prescribed during the consultation review of the project by applicable agencies (e.g., CDFW, NOAA, etc.) would also be required.	Measures to be included in construction documents for approval by City. Measures to be implemented during construction, prior to in-water work.	Review and approval of construction documents by City. Review and approval of construction commitments and operating procedures by applicable agencies. Proof of implementation of appropriate measures.	City of Del Mar Planning Division, Engineering Department CDFW, NOAA, etc. Construction Contractor
Develop and implement a plan to keep debris out of the lagoon. Measures included in the plan may include suspending protective covers from the existing bridge, on the ground below, or floating on the water.	Measures to be included in construction documents for approval by City. Measures to be implemented during construction.	Review and approval of plan by City. Proof of implementation of appropriate measures.	City of Del Mar Planning Division, Engineering Department Construction Contractor

Project Design Feature or Best Management Practice	Timing	Action Indicating Compliance	Responsible Entity
Conduct "worker environmental awareness training" at the project site prior to construction for each on-site construction crew member.	Measure to be implemented prior to construction.	Proof of implementation of training.	City of Del Mar Planning Division Construction Contractor
A designated project biologist shall conduct regular construction monitoring to monitor environmental compliance and ensure the project mitigation measures, construction operating procedures, and BMPs are implemented/maintained. The frequency of monitoring shall be determined by the designated project biologist in coordination with the City and Construction Contractor.	Measure to be implemented during construction; frequency to be determined by designated project biologist.	Retention of a qualified biologist. Proof of completion of regular construction monitoring by a qualified biologist.	City of Del Mar Planning Division, Engineering Department Construction Contractor
A Traffic Control Plan (TCP) shall be prepared by a registered traffic engineer and implemented to ensure safe movement of vehicular, bicycle, and pedestrian traffic and adequate emergency access for police, fire, and medical services in the local area. The TCP shall include public information for motorists, bicyclists, and pedestrians; lane closures and road detours associated with overnight construction activities; incident management; and construction information. Temporary signs and traffic control advanced warning devices shall be placed along the roadway, within the street right-of-way. The contractor shall obtain traffic control permits from the City.	Measure to be implemented prior to and during construction.	Retention of a registered traffic engineer. Review and approval of TCP by City. Proof of obtaining traffic control permits. Proof of implementation of appropriate measures.	City of Del Mar Planning Division, Engineering Department Construction Contractor
Preparation of the beach areas on both sides of the bridge for construction, including establishing Construction Contractor fencing at the project boundaries, installing a covered pedestrian boardwalk (southwest corner) to provide pedestrian access to Del Mar Beach, and displaying signage that directs coastal visitors to coastal amenities in the area, including the beaches and the River Path Del Mar (River Path). The two crosswalks closest to each abutment shall be temporarily relocated during construction. The crosswalk at the southern abutment that connects to the River Path to the east and Del Mar Beach to the west shall be removed and a temporary crosswalk established further south at Sandy Lane, approximately 300 feet from the southern bridge abutment. The crosswalk at the northern abutment shall also be removed and the existing crosswalk to the north shall remain to provide pedestrian access to Del Mar Beach during construction.	Measure to be implemented prior to construction.	Review and approval of construction documents by City. Proof of implementation of appropriate measures.	City of Del Mar Planning Division, Engineering Department Construction Contractor
Installation of permanent water quality devices to treat and discharge road runoff during storm events. Such devices may include, but are limited to, "Green Street" tree wells that include biofiltration soil.	Measure to be implemented following completion of construction.	Proof of implementation of water quality devices.	City of Del Mar Planning Division, Engineering Department Construction Contractor

Project Design Feature or Best Management Practice	Timing	Action Indicating Compliance	Responsible Entity
Implementation of temporary lighting shall be required to be oriented downward (toward the bridge deck) and the lighting source would be required to be shielded in order to minimize light spill.	Measure to be implemented during construction.	Proof of implementation of appropriate measures.	City of Del Mar Planning Division
Implementation of standard dust control BMPs to meet the requirements of San Diego County Air Pollution Control District (SDAPCD) Rule 55, including watering all exposed surfaces twice daily.	Measures to be included in construction documents for approval by City. Measures to be implemented during construction, prior to activities that may result in dust.	Review and approval of construction documents by City. Proof of implementation of appropriate measures.	City of Del Mar Planning Division, Engineering Department Construction Contractor
Implementation of standard BMPs to meet the requirements of State of California Health and Safety Code Sections 41700 and 41705, and SDAPCD Rule 51 to minimize equipment idling and maintain equipment to reduce odor emissions from equipment exhaust.	Measures to be included in construction documents for approval by City. Measures to be implemented during construction, prior to activities that may result in objectionable odors.	Review and approval of construction documents by City. Proof of implementation of appropriate measures.	City of Del Mar Planning Division, Engineering Department Construction Contractor
If unknown human remains are discovered during construction, project construction activities shall be required to comply with California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. Specifically, if human remains are discovered, the San Diego County Coroner shall be immediately contacted for a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. If the remains are determined to be of Native American origin, the Coroner would notify the Native American Heritage Commission, which would determine and notify a Most Likely Descendant (MLD). With the permission of the City and/or its authorized representative, the MLD may inspect the site of the discovery, and shall complete the inspection within 24 hours of notification by the NAHC. The MLD would have the opportunity to make recommendations to the NAHC on the treatment and disposition of the remains.	Measures to be implemented during construction if human remains are discovered.	If human remains are discovered, proof of compliance with California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98.	City of Del Mar Planning Division Construction Contractor Native American Heritage Commission
Divert a minimum of 65 percent of construction and demolition debris, in compliance with the City's Construction and Demolition Waste Recycling Ordinance and California Green Building Standards requirements.	Measure to be included in construction documents for approval by City.	Review and approval of plan by City.	City of Del Mar Planning Division, Engineering Department

Project Design Feature or Best Management Practice	Timing	Action Indicating Compliance	Responsible Entity
	Measure to be implemented during construction.	Proof of implementation.	Construction Contractor
It shall be the responsibility of the Construction Contractor to remove demolition and construction materials from the site. The Construction Contractor shall be required to comply with federal, state, and local statutes and regulations related to solid waste reduction, including waste management, reduction, and recycling of demolition and construction debris and waste. Such waste would be source separated on-site for reuse, recycling, or proper disposal. For construction waste that cannot be diverted or recycled, such as material packaging and food-related trash generated by employees, landfills in the region would have adequate capacity to fulfill the project's solid waste generation needs.	Measures to be implemented during demolition and construction.	Review and approval of construction and demolition documents by City. Proof of implementation of appropriate measures.	City of Del Mar Planning Division City of Del Mar Engineering Department Construction Contractor
Implementation of recommendations and seismic design considerations in the project Geotechnical Report and Foundation Report to provide suitable subsurface conditions to support the replacement bridge. Includes, but not limited to, recommendations for over-excavation and replacement with new, compacted engineered fill per ASTM International soil compaction standards.	Measures to be implemented during final design and construction.	Review and approval of construction documents by City. Proof of implementation of appropriate measures.	City of Del Mar Planning Division, Engineering Department Construction Contractor
Sampling of the sign, guard rail posts, or decking for the presence of wood-preserving chemicals shall be conducted prior to demolition and treated wood waste would be handled consistent with Caltrans' Standard Special Provisions 14-11.14.	Measure to be implemented prior to demolition.	Proof of implementation of sampling.	City of Del Mar Planning Division Construction Contractor
Implementation of a project-specific SWQMP that includes specific BMPs to avoid or reduce potential impacts related to the use and potential discharge of construction-related hazardous materials. BMPs shall include, but not be limited to, the following: • No demolition or construction materials, equipment, debris, or waste would be placed or stored where it may enter receiving waters or a storm drain or be subject to river, wind, rain, or tidal erosion and dispersion. • All stockpiles and construction materials would be covered and enclosed on all sides, be located as far away as possible from drain inlets and waterways, and may not be stored in contact with soil. • Machinery and equipment would be maintained and washed in confined areas specifically designed to control runoff. If thinners, petroleum products or solvents must be used on site, they would be properly recycled or disposed after use and may not be discharged into storm drains, sewers, receiving waters, or onto the unpaved ground.	Measures to be included in SWQMP for approval by City. Measures to be implemented during construction, prior to activities that may result in sedimentation and/or erosion.		City of Del Mar Planning Division, Engineering Department Construction Contractor

Project Design Feature or Best Management Practice	Timing	Action Indicating Compliance	Responsible Entity
• Spill prevention and control measures would be implemented to ensure the proper handling and storage of petroleum products and other construction materials. Measures would include a designated fueling and vehicle maintenance area with appropriate berms and protection to prevent spillage of gasoline or related petroleum products or contact with runoff. The designated area would be equipped with spill control materials and located to minimize the risk of spills reaching receiving waters, storm drains, sewers, or unpaved ground. • Reasonable and prudent measures would be taken to prevent discharge of fuel or oily waste from heavy machinery or construction equipment into coastal waters. Adequate equipment would be available to contain such spills immediately.			