Appendix A

Notice of Preparation

City of Del Mar

Del Mar Resort Specific Plan
Environmental Impact Report
Notice of Preparation

Date: September 29, 2017

To: State Clearinghouse, Responsible Agencies, Trustee Agencies, Interested Parties and Organizations

From: City of Del Mar

Subject: Notice of Preparation of an Environmental Impact Report and Scoping Meeting for the Proposed Del Mar Resort Specific Plan Project

The City of Del Mar (City) will be the Lead Agency under the California Environmental Quality Act (CEQA) as amended [Public Resources Code, §21000-21178 and California Code of Regulations, Title 14, Chapter 3, §15000-15387] and will initiate preparation of an Environmental Impact Report (EIR) in accordance with CEQA for the proposed Del Mar Resort Specific Plan (proposed project). This Notice of Preparation (NOP) provides information describing the proposed project and its potential environmental effects. The Draft EIR will describe the project need, goals, and objectives, baseline environmental conditions within the project study area, and the potential environmental effects associated with implementation of the proposed project.

The City is requesting input from government agencies, other organizations, and private citizens regarding the scope and content of the environmental information that should be included in the Draft EIR. Responsible agencies are requested to indicate their statutory responsibilities in connection with the proposed project. Public agencies receiving this NOP may need to consider the Draft EIR if they need to issue permits or other approvals of the project.

Project Background

The proposed project involves legislative and development components that would be addressed through a Specific Plan process. The Specific Plan process ensures that opportunities for the involvement of citizens, public agencies, public utilities, civic education, and other community groups are provided. The project proponent, Zephyr Partners, has held three public meetings to present preliminary plans to the public and to receive early feedback and community concerns. The first meeting, held on May 6, 2017, was a public outreach meeting, while the second and third meetings on May 13 and August 29 were conducted pursuant to the City's Citizen Participation Program (CPP).

Project Location

The project site includes approximately 16.56 acres and is located south of Border Avenue and west of Camino Del Mar, in the northwestern corner of the City of Del Mar. Assessor's Parcel Numbers (APNs) include 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The site comprises eight parcels, seven of which are vacant. The southernmost parcel is currently developed with a one-story, 5,800-square foot

residence (with accessory garage structure and pool cabana building). See Figure 1, *Regional Location*, and Figure 2, *Project Vicinity*, attached to this NOP. Additional areas that may be included in the project and study area would include the City of Del Mar North Bluff Preserve (APN: 299-030-07), Camino del Mar public right-of-way easterly and adjacent to the site, portions of the North Beach, and a City coastal viewing access easement (APN: 298-241-18) located at the northern extent of the project site.

Project Description

The proposed project consists of a Specific Plan for a multiple-building resort complex including approximately 290 hotel rooms and 86 residential units (see Figure 3, *Conceptual Site Plan*). The resort would include a main hotel building on the northeast portion of the project site, as well as individual hotel guestrooms and residential units throughout the center of the project site. Low-cost visitor accommodations and employee housing are also proposed within the resort project.

The project would incorporate a minimum 40-foot setback from the bluff top and an emergency vehicle access road surrounding the development boundary. The proposed project would not exceed four stories in building height and would not exceed 46 feet in height above natural grade. The project includes two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center, and three swimming pools. A total of 656 parking spaces would be provided, including 460 hotel spaces, 172 residential spaces, and 24 visitor spaces, some of which would occur in an underground parking structure. Access to the proposed project would be via Border Avenue to the north of the site at the intersection of Border Ave and S. Sierra Ave.

Resort and public amenities that may also be considered with the development of the Specific Plan project include additional public access and passive recreational improvements, and public/private beach and safety facilities.

Required Approvals

Required legislative and development entitlement approvals include: (1) Specific Plan; (2) Community Plan Amendment; (3) Local Coastal Program Amendment; (4) Rezone; (5) Tentative Subdivision Map; (6) Design Review Permit; (7) Land Conservation Permit; and (8) Coastal Development Permit.

Public Review Period

The City has made this NOP available for public review and comment pursuant to California Code of Regulations, Title 14, Section 15082(b). The comment period for the NOP begins on September 29, 2017 and ends on October 30, 2017. An Initial Study Checklist is not required as it is known that an EIR will be prepared (CEQA Guidelines Section 15063(a)). All CEQA issues will be evaluated and significant impacts will be identified in the EIR, as applicable; with a focus on the following probable environmental effects: Aesthetics, Air Quality, Biological Resources, Cultural Resources (including Tribal Cultural Resources), Geology and Soils (including bluff erosion/instability), Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use (including Coastal Zone requirements), Noise, Public Services, Transportation/Traffic, and Utilities, Service Systems, and Energy. Other environmental effects including Agriculture and Forestry Resources, Mineral Resources, Population and Housing, and Recreation, are not anticipated to result in significant impacts and are expected to be discussed in the EIR as Effects Found Not to be Significant.

Responses and Comments

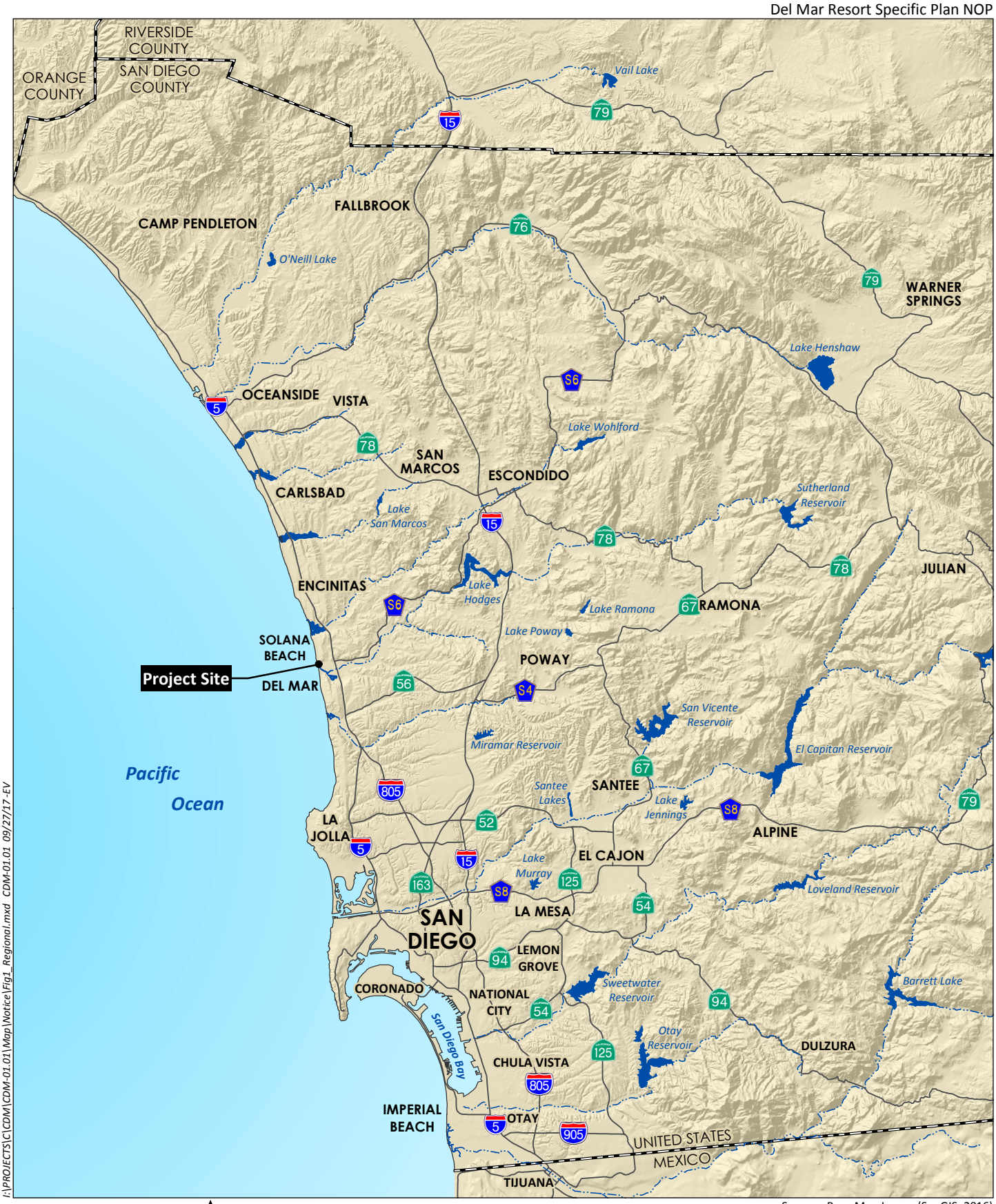
Please submit your written comments related to the scope and content of the forthcoming Draft EIR no later than October 30, 2017 at 4:30 p.m. You may send your responses and comments to Matt Bator, AICP, Senior Planner – City of Del Mar, 2010 Jimmy Durante Boulevard, Suite 120, Del Mar, California, 92014 (Temporary City Hall address), or by email to **mbator@delmar.ca.us**.

Public Scoping Meeting

The City will hold a public scoping meeting on Wednesday, October 11, 2017 at 6:30 p.m. at the City's Council Chambers, located at 2010 Jimmy Durante Boulevard, Suite 120, Del Mar, California, 92014. You are welcome to attend and present environmental information that you believe should be considered in the EIR.

Attachments:

Figure 1, *Regional Location*
Figure 2, *Project Vicinity*
Figure 3, *Conceptual Site Plan*



I:\PROJECTS\C\CDM\CDM-01.01\Map\Notice\Fig1_Regional.mxd CDM-01.01 09/27/17 -EV

0 8 Miles

Source: Base Map Layers (SanGIS, 2016)

HELIX Environmental Planning

Regional Location

Figure 1

I:\PROJECTS\C\CDM\CDM-01.01\Map\Notice\Fig2_Vicinity.mxd CDM-01.01 9/28/2017 -EV

0 600 Feet

Source: Base Map Layers (SanGIS, 2014)

HELIX Environmental Planning

Project Vicinity

Figure 2

I:\PROJECTS\C\CDM\CDM-01.01\Map\Notice\Fig3_SitePlan.indd CDM-01.01 09/27/17 -LG

Source: Zephyr Partners, 2017

HELIX Environmental Planning

Conceptual Site Plan

Figure 3

City of Del Mar

Welcome to the October 11, 2017 Scoping Meeting
For the Del Mar Resort Project Environmental Impact Report (EIR)

Sign-in Sheet

SB

Name	Address	#31	e-mail
Jan Shield	190 Del Mar Shores Ter.		JANShields190@
BERNIE & RITA RENSKY	809D BEACHFRONT DR, SB		gmail.com
Jennie Tomlinson	16450 Shore Drive, SB.		bernierensky@msn.com
			jennie.tomlinson.cls@gmail.com
Carol Bohl & Ben Bohl	842 S. Cedros Ave		bbohl2@roadrunner.com
Linda Maher	157 S Shore Dr SB		
Insook Kang	765 Ocean Surf Dr.		
Julia Chunn-Heer	9883 Pacific Height Blvd Ste D	San Diego 92121	julia@surfridersd.org
Brian Guiltinan	PO BOX 675785 RSF CA 92067		
HUGH CREE	~~PO Box 35~~ 1051 FREEDOM	92014	
Whip Wa Ha	748 Solana Cir E	92075	
Bob SEXTON	5123 CHELTERHAM TERR SD	92130	
Joyce DOHERTY	166 N SHORE DR. SB.	92075	
TERRY KOPANSKI	1919 ZAPO ST DEL MAR CA		
Raymond Koegel	441 S Sierra Ave. Solana Beach CA		
R John & Gayle Crawford	145 S. Shore Dr SB, CA 92075		
JACOB RAZNY	P.O. BOX 675458 RANCHO SANTA FE, CA 92067		
THOMAS KORONA	762 OCEAN SURF DR., SOLANA BEACH, CA +766		TOMKORONA@MAC.COM
Cindy Thompson	156 S. Shore Dr SB		cithomps@sdccd.edu
Greg Shannon	7310 Parkway Dr #213, La Mesa CA 91942		gregs.spc@att.net
Jennifer Singer	190 Del Mar Shores Ter. 49		singsinger11@gmail.com
Robert Stack, Esq	4445 Eastgate Mall, Ste 200, SD, CA 92121		

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Sign-in Sheet

Name	Address	e-mail
Gigi Fenley-Wright	827D Beachfront Dr Solana Beach	gigifenley@gmail.com
Rusty Wright	" "	
Dorie Harleman	154 S. Shore Dr. SB.	
Suzanne Lah	775 Beachfront Dr. S.B	
Bill Chopyk	City of Solana Beach 635 S. Hwy 101 SB 92075	bchopyk@cosb.org
Barbara Collins	859A Beach Front Dr. S.B. 92075	
Judy Malody	162 N. Shore Dr Solana Beach CA 92075	
Donald Janssen	754 Ocean Surf Dr	djanssen1@yahoo.com
Brian Cooke	163 S Shore Dr. SB	briancooke99@gmail.com
Jane Coleman	765C Beachfront Sol. Beach	janeck1946@hotmail.com
Jennifer Hawkins	" " "	mjch614@gmail.com
Linda Meyerson	13676 Durango Dr. DM	Lindakm136@gmail.com
James Finnell	752 So Sierra Ave Solana Beach	
Mark Bazzett	143 South Shore Dr Solana Beach	mbazzett@hotmail.com
Sam Kushner	561 S. Sierra Ave #40 Solana Beach	
Jack Jaeger	129-10th St Del Mar	
Rick Kuhnla	742 S Sierra Ave Solana Beach CA 92075	RLKUHNLA@GMAIL.COM
Winifred Glucknerr	137 S. Shore Drive	
Robert Green	1440 Akita Ln Encinitas CA	robert@theroberteneon company.com

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1. **Sign up to speak at tonight's meeting and/or**
2. **Provide a written comment(s)**

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Name: Joyce Doherty

Address: 161 N. Shore Dr. SB.

Email: joyce@pacificcoastal.net

Please check the following boxes, as applicable:

☒ I would like to be notified of information or events related to the Del Mar Resort Project.

☐ **I would like to speak at tonight's meeting:**
Please note that speakers will be allotted three minutes to provide oral comment. Donations of time may be allotted for a maximum time of nine minutes of comment by any speaker.

Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

See attached

Del Mar Resort Proposal
EIR Issues:

Traffic: Border Ave. is a small, narrow, short street leading to approximately 1,000 condos along S. Sierra Ave. In order to accommodate the potential traffic that would occur from the resort, Border Ave. would have to be widened to twice the size of it's current width. It would need to have a dedicated lane to accommodate traffic going from the resort to the coast highway, and a dedicated left turn lane to accommodate traffic going into the resort. Traffic definitely should not be directed to S. Sierra Ave.

S. Sierra Ave. cannot be widened and already has heavy traffic flows daily and in the evenings to accommodate the needs of the residents and visitors that come and go into the complexes.

Project building height and size: 4 stories high is not in compliance with the surrounding communities or with the coastal corridor. No other buildings or projects are higher than 3 stories. Ideally a project this size should be 2 stories high. The proposed height would downgrade the esthetics of the area greatly. It would destroy the coastal views from all directions and look like an unbecoming and inappropriate structure for the beautiful Del Mar and Solana Beach communities.

The auditorium sized building right by the front of the project would add to the unattractiveness of the resort and the surrounding area.

Noise pollution: The noise from corporate events, weddings, entertainment and guests will have a very negative effect on the adjacent residential areas. The section of the resort for events should be away from the residential area and further south. Also, any noisy equipment to run utilities, air conditioning, etc. should be well insulated and far from the residential areas.

During construction, the noise pollution will be very heavy and will need serious controls for keeping it to minimum noise levels and hours of operation.

Air quality: During construction it is important to manage the air quality through the highest and best methods to minimize the effects on the surrounding residences.

The number of vehicles coming and going into and out of the resort as well as the sources of energy to run the resort will pollute the air dramatically.

Privacy and light pollution: The buildings adjacent to the Del Mar Beach Club must be set back a far enough distance so as not to block the sunlight and air flow onto the patios and into the homes along the north side of the project. Also, if they are not set back substantially there will be a lack of privacy, as they will be looking directly into the homes and the bedrooms of the homes from the windows of the buildings.

A possible solution for this would be a beautifully landscaped area surrounding the proposed walking path on the north side of the project.

Bluff erosion: A project of this size and scope will place a very heavy burden on the bluff erosion problem. It should have substantial setbacks from the bluff and be of a size that will not put undue stress on the bluff.

Presented by Joyce Doherty, Broker and bluff resident
Pacific Coastal Properties

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Name: Winfred M Glockner

Address: 131 S. Shore Drive Solana Beach 92075

Email: WinMgeSBcGlobal.net

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

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Name: Insook Kang

Address: 765 Ocean Surf Dr. Solana Beach

Email: iKang01@gmail.com

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

The proposal submitted is not the same as the original plans, designs at the exhibition. The current plan would cause lots of traffic near DMBC, block the ocean breeze for the community of DMBC, that doesn't allow airconditioner in the complex. We are proud of not having airconditioner so that we can contribute to sustainable environment. Also, 4-story buildings wouldn't blend into the beautiful present view, that we should keep this area natural while designing lower and quaint look for the community and the visitors as well.

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Name: Donald L. Janssen

Address: 754 Ocean Surf Dr

Email: djanssen1@yahoo.com

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

- Traffic flow especially on Sierra
- Aesthetics of buildings
- Density + noise for special events
- Pedestrian safety at Via De La Valle + Hiway 101 / Camino Del Mar
- Bluff safety + integrity

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Name: Whip Walton

Address: 748 Solana Circle E S.B. 92075

Email: Whipwalton@yahoo.com

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

100%

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Name: BERNIE & RITA RENSKY

Address: DMBC - 8091 BEACHFRONT DR, SB 92075

Email: bernierensky@msn.com

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

TRAFFIC @ BORDERS

BEACH ACESS - EXISTING TRAIL at SOUTH DMBC PROPERTY LINE

IS THERE A GATE KEEPER - 24 HR.

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Name: Linda Maher

Address: 157 S. Shore Dr., Solana Beach 92075
mailing address: 4213 Camellia Ave, Studio City, CA 91604

Email: lindatmaher@sbcglobal.net

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

My concerns are increased air pollution / greenhouse gasses, noise pollution, traffic congestion, bluff erosion, building density and destruction of native trees and bird habitats

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Name: Rick Kuhnla

Address: 742 S Sierra Ave, Solana Beach

Email: RLKUHNLA@GMAIL.com

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

I am concerned about the effect this project could have on the local residents on South Sierra Ave in Solana Beach. Issues which I think should be addressed include the increases in traffic and noise in a low key neighborhood. A development of that size has the potential to significantly change the area, and that change should be fully understood before a project is approved

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Name: JIM JAFFEE

Address: 738 Seabright Ln Solana Beach

Email: jimjaffee@gmail.com

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

In addition to the written comments I already emailed to MATT BATOUR for incorporation in scoping please also add that access from Border Ave for the public should be considered as part of the vertical access.

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Name: Jennie D. Tomlinson > owner: 164 S. Shore Dr Solana Bch. Ca 92075

mailing Address: 1640 Queenston Dr., Escondido, Ca 92027

Email: jennie.tomlinson.cls@gmail.com

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

Sent an email but — feel this is a Money Grab @ Solana Beaches/DMBC cost
erosion concerns - been here 46 years and seen needs
traffic - Border Ave
increased noise -
proposal originally ½ size for hotel
height causing concern for the weather/wind etc
40' setback not big enough between DMBC property line
Originally - this land would not get developed -
Rental's are greater competition
40' setback did not work for DMBC - ended w/ increased seawalls

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Name: Jennifer Singer

Address: 190 Del Mar Shores Ter 49 92075

Email: ringsinger11@gmail.com

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The delmarresort.com

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

Involvement of City of Solana Beach.

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Name: TERRY KOPANSKI

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Donation of time from Ben Bohl

Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

Scope of Project is too large
Height of Project is too ~~tie~~ high
Traffic / public safety & Parking is major issue
Noise & Trash Issues -
Slope Stability -
Tribal Cultural Resources - No Casino
Keep it Zoned as 8 parcels w/ luxury Del Mar Homes
Do Not Rezone this property for commercial
290 Hotel rooms, 89 Resident, Banquet Facility, Ballroom
2 Restaurants

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or submit my letter to be Read! -TAX

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

Entrance off Border
LACK of Amenities for Locals

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Comment(s) on issues/topics that should be addressed in the Del Mar Resort EIR:

HERE IN SUPPORT OF THIS PROJECTS POSITIVE IMPACT FOR OUR NORTH COUNTY COASTAL REGION. LET'S GO THREW THE PUBLIC PROCESS AND PROPERLY VET THE PROJECT.

Appendix B

Visual Impact Assessment

DRAFT

Visual Impact Assessment for the Marisol Project

Prepared for:

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Prepared by:

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NOVEMBER 2019

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TABLE OF CONTENTS

Section **Page No.**

ACRONYMS AND ABBREVIATIONS VII

1 INTRODUCTION 1
1.1 Purpose of the Visual Impact Assessment 1

2 PROJECT DESCRIPTION 3
2.1 Zoning and Land Use Designations 6
2.2 Regulatory Framework 6
2.2.1 Federal 6
2.2.2 State 6
2.2.3 Local 7

3 PROJECT SETTING 11

4 VIEWER GROUPS, RESPONSE AND EXPOSURE 15
4.1 Residential Groups 15
4.2 Motorist Groups 17
4.3 Recreational Groups 23
4.4 Commercial Groups 25
4.5 Rail User Groups 26
4.6 Leisure Groups 26

5 KEY VIEW ASSESSMENT 29
5.1 Methodology 29
5.2 Photo Simulations 30
5.3 Key View Assessment 31
5.3.1 Key View 1 – West Solana Circle (City of Solana Beach) 31
5.3.2 Key View 2 – South Sierra Avenue (City of Solana Beach) 33
5.3.3 Key View 3 – Via de la Valle at Highway 101 34
5.3.4 Key View 4 – Via de la Valle at South Cedros Avenue 36
5.3.5 Key View 5 – Del Mar Coastline northwest of North Beach 37
5.3.6 Key View 6 – Camino Del Mar (North of Lagoon Bridge) 37
5.3.7 Key View 7 – Camino Del Mar (South of Lagoon Bridge) 39
5.3.8 Key View 8 – Del Mar Coastline south of North Beach 40
5.3.9 Key View 9 – Jimmy Durante Boulevard at San Dieguito River Bridge 42
5.3.10 Key View 10 – Balboa Avenue (City of Del Mar) 43
5.3.11 Key View 11 – Camino Del Mar at Jimmy Durante Boulevard 44
5.3.12 Key View 12 – Del Mar Plaza Roof Deck 45
5.3.13 Key View 13 – James Scripps Bluff Preserve Trail 46

6 VISUAL IMPACT ASSESSMENT 49

7 REFERENCES 61

FIGURES

1 Project Location 63
2a Land Use Plan 65
2b Conceptual Site Plan 67
3 Conceptual Lighting Plan 69
4 Conceptual Fencing 71
5 Conceptual Signage 73
6 Conceptual Planting Plan 75
7 Zoning 77
8 Project Setting Photographs Key Map 79
9 Project Setting (1 of 5) 81
10 Project Setting (2 of 5) 83
11 Project Setting (3 of 5) 85
12 Project Setting (4 of 5) 87
13 Project Setting (5 of 5) 89
14 Viewshed Analysis 91
15 Key Views 93
16a Key View 1 - West Solana Circle (City of Solana Beach) 95
16b Key View 1 - West Solana Circle (City of Solana Beach) 97
17a Key View 2 - South Sierra Avenue (City of Solana Beach) 99
17b Key View 2 - South Sierra Avenue (City of Solana Beach) 101
18a Key View 3 - Via de la Valle at Highway 101 103
18b Key View 3 - Via de la Valle at Highway 101 105
19a Key View 4 - Via de la Valle at South Cedros Avenue 107
19b Key View 4 - Via de la Valle at South Cedros Avenue 109
20a Key View 5 - Del Mar Coastline northwest of North Beach 111
20b Key View 5 - Del Mar Coastline northwest of North Beach 113
21a Key View 6 - Camino Del Mar (North of Lagoon Bridge) 115
21b Key View 6 - Camino Del Mar (North of Lagoon Bridge) 117
22a Key View 7 - Camino Del Mar (South of Lagoon Bridge) 119
22b Key View 7 - Camino Del Mar (South of Lagoon Bridge) 121
23a Key View 8 - Del Mar Coastline South of North Beach 123
23b Key View 8 - Del Mar Coastline South of North Beach 125
24a Key View 9 - Jimmy Durante Boulevard at San Dieguito River Bridge 127
24b Key View 9 - Jimmy Durante Boulevard at San Dieguito River Bridge 129
25a Key View 10 - Balboa Avenue (City of Del Mar) 131

25b Key View 10 - Balboa Avenue (City of Del Mar) 133
26a Key View 11 - Camino Del Mar at Jimmy Durante Boulevard 135
26b Key View 11 - Camino Del Mar at Jimmy Durante Boulevard 137
27a Key View 12 - Del Mar Plaza Roof Deck 139
27b Key View 12 - Del Mar Plaza Roof Deck 141
28a Key View 13 - James Scripps Bluff Preserve Trail 143
28b Key View 13 - James Scripps Bluff Preserve Trail 145

TABLES

1 Summary of Development Standards Pertinent to Visual Resources 4
2 Key View Distance Zones 30

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
3-D	three dimensional
amsl	above mean sea level
City	City of Del Mar
Specific Plan	Marisol Specific Plan

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1 INTRODUCTION

1.1 Purpose of the Visual Impact Assessment

This study serves as an independent visual impact assessment for the proposed Marisol Specific Plan Initiative and subsequent project approvals (Project). The purpose of this study is to evaluate Project impacts to existing ocean views, neighborhood character, landform alteration, and architectural and development features to ensure compatibility with the surrounding neighborhood characteristics and the City of Del Mar (City) development regulations.

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2 PROJECT DESCRIPTION

The Plan Area includes approximately 17.45 acres of land, located at Border Avenue and west of Camino Del Mar, as well as a portion east of Camino Del Mar, in the northwestern corner of the City of Del Mar (see Figure 1, Project Location). The Plan Area is comprised of 16.55 acres of privately owned land, 0.78 acres of public right-of-way along Camino Del Mar, and a 0.12-acre City coastal viewing access parcel located at the northern extent of the Plan Area. The Specific Plan Area would be accessible from the intersection of South Sierra Avenue and Border Avenue on the northern side of the Plan Area.

The Project is a specific plan that includes five land use sub-designations: Visitor Serving Accommodations (VSA), Parkland/Passive Open Space (PPOS), Coastal Bluff Protection Area (CBPA) and Steep Slope Protection Area (SSPA). Land use sub-designations are illustrated on Figure 2a, Land Use Plan. The VSA land use sub-designation allows for the development of approximately 65 resort guest rooms, 31 villas (some of which may be used as resort guest rooms when not in use by owners, subject to provisions in the Specific Plan), 10 lower-cost shared visitor-serving accommodations, 22 affordable housing units, and associated amenities. Amenities include, but are not limited to, restaurants, bar/lounge, special event space, meeting space, swimming pools, a spa and fitness center and retail. Details of the Specific Plan land use concepts are illustrated on Figure 2b, Conceptual Site Plan.

The PPOS land use sub-designation allows for public amenities such as trails, vista points, picnic areas, public access stairway and public restrooms, and passive recreational uses. Passive recreational uses are defined in the Specific plan as low intensity recreational activities that require little or no infrastructure and that are geared toward the viewing and appreciation of scenic and environmentally sensitive areas.

The CBPA and SSPA land use sub-designations serve as protection areas. The only disturbance allowed within the CBPA is the minimal amount necessary to install drainage control measures to protect a coastal bluff area from degradation and/or erosion. Shoreline protection devices are prohibited in this area. The only disturbance allowed within the SSPA is the minimal amount necessary to provide a public access stairway, public restrooms, and related facilities for hotel and public visitor services at the toe of slope; to implement drainage control measures to protect the steep slope area from degradation and/or erosion; and to allow interpretive signage and pathway lighting.

Development of the Project site would also include the implementation of a site lighting plan, fencing plan, signage plan, and general planting plan. See Figure 3, Conceptual Lighting Plan, Figure 4, Conceptual Fencing, Figure 5, Conceptual Signage, and Figure 6, Conceptual Planting Plan.

The Specific Plan establishes development standards and design guidelines that regulate land uses and development of property within the Specific Plan Area. Development standards pertinent to visual resources include density, setbacks and buffers, height, open space areas and landscape and lighting. Table 1 identifies specific development standards that will inform the visual characteristics of the Project.

Table 1
Summary of Development Standards Pertinent to Visual Resources

Issue Area	Development Standard
Maximum density	4 dwelling units per acre (applies to VSA land use designation)
Setback Buffer from Top of Bluff	The greater of 40 feet (per City of Del Mar Municipal Code Section 30.55.080); or in accordance with the factor of safety as recommended by the geotechnical engineers (see subsections A through C below)
Maximum height	46 feet from natural grade[1]; 1-3 stories
Minimum percentage of open space within the Specific Plan area	35%
Landscaping	Landscaping within the VSA and POS land use designations shall be composed of drought-tolerant vegetation and/or native plants defined as those indigenous to the southwestern United States. All existing on-site invasive, exotic (non-native) plant species shall be removed,
Lighting	Limited to (1) accent lighting (1 to 5 foot candles; located low to ground or in locations out of sight), (2) architectural lighting (5 to10 foot candles; intended to illuminate certain structures and walls), (3) pathway lighting (1 to 5 foot candles; intended to frame any emergency access or pedestrian pathways), and (4) roadway lighting (to illuminate driving surfaces within the VSA land use; maximum pole height of 26 feet). Lighting that is adjacent to open space areas shall be directed away from those areas. When necessary, lighting shall be adequately shielded to protect open space areas from spill over or night lighting.

[1] Buildings shall be terraced to maximize preservation of coastal views for residents and visitors of the hotel; maximum height of buildings shall be in accordance with Figure 3-8, Building Height, of the Specific Plan.

Site Design, Architectural and Landscaping Guidelines are included in the Specific Plan. Regarding Site Design, proposed buildings would be sited so that the low intensity structures are located closest to the bluff to provide edge treatment and preserve views and open space. Further, the placement of buildings should consider organic, undulating edges that follow the natural topography in order to achieve a design that preserves views and open space (Dudek 2019). Architectural guidelines envision a coastal-inspired architectural character that blends harmoniously with the character of existing surrounding development and coastal bluff. In addition, the design of the Project emphasizes horizontal elements over vertical ones to tie the buildings to the landscape. Lastly, architectural styles would implement a coastal-inspired architectural character including a mix of contemporary materials and styles that mimic natural materials. The colors of materials consist of warm, natural tones and may include the following materials: wood siding/rain screen, terra-cotta rain screen, synthetic wood composite, and cementitious composite siding.

Guidelines for Building Orientation, Scale, and Exterior Materials and Finishes are included within the Architectural Guidelines. For example, buildings should be placed, oriented, and spaced to preserve important vistas from, to, and over the site. Buildings should also follow the natural contours of the site. Regarding scale and height, the Specific Plan Area may have a combination of one-, two-, and three-story structures, with the highest structures setback from the Specific Plan Area boundary. Architectural finish materials should consist of natural and/or "natural looking" material sources that are durable and suitable for the coastal environment and compatible with the VSA's architectural character. Roofing materials may include polyvinyl chloride (PVC) membrane roofing, thermoplastic polyolefin (TPO) membrane roofing, recycled rubber tile, metal tile, clay tile, slate. In addition, proposed roofs would be light-colored "cool roofs" to follow best practices for minimizing solar heat gain into buildings. Siding materials may include steel, stone veneer, cast stone, fiber cement, exterior insulation finish systems, treated wood, solid naturally decay-resistant wood, masonry and concrete. Ground plane finishes may include architecturally exposed cast-in-place concrete (Type 3 "warm" cement) with sand finish or form liners, cement plaster in natural colors, stone or wood. Lastly, glazing/glass should be extensive to capture the expansive ocean views. Further, glass specifications should be highly transparent, low reflectivity, with little to no color tinting, while also meeting California Building Code standards.

Regarding landscaping, a Mediterranean and coastal California plant palette is encouraged throughout the Specific Plan Area to combine drought tolerance with aesthetic impact. In addition, the overall landscape palette should feature native plant species to unify the Specific Plan Area with the surrounding landscape. Landscaping should predominantly use drought-tolerant, native plants that require minimum irrigation and maintenance. Lastly, a variety of colors and textures of plants, foliage, bark, and flowers should be used to create a visually stimulating environment.

For purposes of this analysis, future buildings along the northern and eastern perimeter of the site (i.e., those most likely to be visible by receptors in the surrounding area) were assumed to be two- to three- stories in height with terraces on the upper floors and flat rooflines. For purposes of this analysis, building materials for the ground floors and upper floors of development included natural appearing wood, and highly transparent glass was assumed for building elevations and along building terraces. As indicated in the Specific Plan, development was assumed to follow the contours of the site and as such, Project buildings would appear at a greater scale in the central and western portion of the site than in the eastern portion. In addition to the shrubs described above and identified on Figure 4-9 of the Specific Plan, the installation of flowering shrubs and regular to irregularly spaced trees on the Project site and specifically, at the main Project entrance off Border Avenue, along the northern property line and along the eastern property line was assumed.

2.1 Zoning and Land Use Designations

The Project site is zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density) (see Figure 7, Zoning). The City's 1985 Community Plan designates the Project site as Very Low Residential Density (City of Del Mar 1976). The Project proposes to redesignate the site as "Marisol Specific Plan" land use category and rezone the site as "MSP (Marisol Specific Plan)". Surrounding land is zoned Public Parkland to the south, R1-40 (Very Low Density) to the north, Beach Commercial to the northeast along Highway 101, and Floodway to the east.

2.2 Regulatory Framework

2.2.1 Federal

There are no federal regulations or policies pertaining to visual resources that are applicable to the Project or Project site.

2.2.2 State

California Coastal Act

Adopted by the state legislature in 1976, the California Coastal Act (CAA) established the State Coastal Commissions to oversee the long-range planning and development of coastal areas. In addition, the CAA established resource planning and management policies applicable to lands within the Coastal Zone. Management policies pertaining to development (Article 6) are applicable to the Project and Project site.

Section 30251, Scenic and Visual Qualities, of the CAA, states "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 land forms, to be visually compatible with the character of surrounding areas and where feasible, to restore and enhance visual quality in visually degraded areas."

State Scenic Highway Program

California's Scenic Highway Program was created by the Legislature in 1963. Its purpose is to preserve and protect scenic highway corridors from change, which would diminish the aesthetic value of lands adjacent to highways. There are no designated or eligible scenic highways in the area listed in the California Scenic Highway Program in the proposed Project area.

2.2.3 Local

City of Del Mar Community Plan

The City's Community Plan, also known as a General Plan, is its "constitution for development" (City of Del Mar 1976). The Community Plan includes multiple elements including elements related to environmental management, transportation, community development, housing and recreation. According to the Community Plan, Del Mar (and the coastal communities of Carlsbad, Leucadia, Encinitas, Cardiff, and Solana Beach) are characterized by scenic stretches of coastal beaches, picturesque sea cliffs, flat-topped coastal areas, steep mesa bluffs, broad level-floored stream valleys, and gently rolling hills (City of Del Mar 1976). The Project site is located within the North Bluff District of the City of Del Mar. According to the Community Plan, the North Bluff District includes a four-acre city-owned natural preserve, two residential estates and vacant parcel of land planned for modified low-density residential land use.

Applicable policies of the Del Mar Community Plan related to visual resources and the character of development include the following:

- Limit building height to two stories in all residential areas, prohibit three-story facades, and encourage single story development in areas where two-story construction would be disruptive to neighborhood character and scale of development.
- Strengthen height controls to protect scenic vistas from both private and public areas. Construction in areas of view sensitivity should require design approval to ensure protection, in an equitable manner, or the right to view scenic vistas from both near and far.
- Encourage harmonious development which is in scale with the character of existing development.

On page 66 of the Community Plan, a figure titled "Community Development Plan" designates the Project site as Very Low Density.

On page 69, the Community Plan identifies the Project site within the bluffs, slopes and canyon preserve areas map. These areas are identified as having special conservation sensitivities, and the Community Plan includes the following General Criteria for the evaluation of future development within areas of bluffs, slopes and canyons:

1. Encourage one story, wood frame construction in order to maximize the seismic resistance of structures, preserve views and preserve the open space appearance of the areas from a distance.
2. Protect steep slopes by prohibiting construction or grading within 20 feet of the top and ten feet of the bottom of substantial slopes exceeding 25 percent grade. No structures shall over such slopes of setbacks.

3. Harmonize construction and landscaping with the natural as well as the man-mad environment, and ensure that the protection of the natural values of the landscape take precedence over architectural values.
4. Require that future development not obstruct scenic views from public streets, roads, or pedestrian trails.

For non-residential area criteria, the following General Criteria is established:

1. Ensure that future development is sensitive to bluff, lagoon, and ocean views, and blends with the open character of the land.
2. Limit development to low intensity uses that main a low profile character and are of low mass and lot coverage (10 to 20 percent).

City of Del Mar Municipal Code

According to the City of Del Mar Zoning Map (City of Del Mar 1988), the Project site is located in the City's Coastal Bluff Overlay Zone. Allowable uses within the Coastal Bluff Overlay Zone include those allowed by the underlying zone. Regarding development within the overlay zone, "no building, improvement, structure, or portion thereof shall be erected, constructed, converted, established, altered or enlarged; nor shall any lot or premises be excavated or graded for any purpose including, but not limited to, in-ground structures such as swimming pools or spas; nor shall clearance of vegetation occur until both a Conditional Use Permit and a Coastal Development Permit are obtained from the Planning Commission" (City of Del Mar Municipal Code Section 30.55.070). A minimum 40-foot setback from the top edge of the coastal bluff is also established for development on lands within the Coastal Bluff Overlay Zone.

Chapter 23.51, Trees, Scenic Views, and Sunlight, acknowledges that scenic views of the Pacific Ocean, nearby lagoons, canyons, the community and its landscapes and urban forest character, or other scenic vistas, "produce a variety of significant and tangible benefits for residents, property owners and visitors" (City of Del Mar Municipal Code Section 23.51.010[C]). The municipal code defines scenic views as views of the ocean, lagoons, canyons, the community and its landscapes and urban forest character, or other scenic vistas, from the Primary Living Area of a residence. Further, the municipal code establishes a process for private property owners to seek restoration and preservation of their scenic views as follows:

> "A person shall have the right to seek restoration and preservation of Scenic Views or Sunlight that existed at the time they purchased or occupied a property or in the last ten years, whichever is shorter, when such Scenic Views from the Primary Living Area, or Sunlight available to the Primary Living Area or solar energy system of a residence, have subsequently been unreasonably obstructed by the growth of Trees or Vegetation located within the Del Mar City limits and 300 feet of the Applicant's property boundary."

The procedure for resolving a conflict between Trees, Scenic Views, and Sunlight is described in Section 23.51.040 – Procedure – of the municipal code. Standards for Determining Unreasonable Obstruction are established in Section 23.51.050.

Chapter 23.50 specifically references the preservation of natural vegetation, including tree species. The code establishes that Monterey Cypress (*Cupressus macrocarpa*), Torrey Pine (*Pinus torreyana*) and all species of trees located within the Central Commercial zone and the environmentally sensitive Open Space Overlay zone are of particular significance to the City, and should therefore be protected to conserve the environmental qualities of the City. Permits are required to cut, remove, destroy or move a protected tree.

City of Del Mar Local Coastal Program Land Use Plan and Implementing Ordinances

The Coastal Act requires each local jurisdiction along California's coastline to prepare and submit for state certification, a Local Coastal Program for the portion of its areas within a specified Coastal Zone. The Project site is within the City's coastal zone boundary. The following general land use development goals and policies from the City of Del Mar Local Coastal Program Land Use Plan (City of Del Mar 1993) are applicable to the Project site:

- Policy II-1: Maintain the existing small-scale character of the community and permit only one- and two-story, low intensity development with a maximum allowable height of 26 feet.
- Policy II-2: Insure that future development, whether commercial or residential, retains the aesthetic quality of the community by protecting and preserving public views to the ocean and other significant natural resources; and by minimizing the disturbance of natural topography and vegetation.
- Policy III-9a: A minimum of 40 feet from the edge of the coastal bluff top shall be provided in the construction of all principle structures and all accessory structures.
- Policy III-9e: Native and other drought-tolerant plant species shall be utilized in all new bluff top construction projects so as to minimize irrigation requirements and to reduce potential slide hazards due to over watering of the bluffs.
- Policy IV-22: Enhance public improvements along appropriate bluff top areas which provide significant scenic vistas when such improvements are not in conflict with bluff preservation policies.

The Project site is located in the LCP Land Use Plan's Bluff, Slope and Canyon Overlay Zone. Applicable development review policies of the Bluff, Slope, and Canyon Overlay zone include the following:

- Regulation E (1): In order to preserve viewsheds and the open space appearance of the area from a distance, no structures shall exceed a height of 14 feet as measured pursuant to the provisions of the Del Mar Municipal Code unless it is found that scenic viewsheds and the open space appearance of the areas will be less affected by structures of a greater height.
- Regulation E (2): New development shall be sited and designed to minimize grading and alteration of natural topography and shall be subservient to and complement the natural topography of the area. Protection of the natural values of the surrounding topography and landscape shall take precedence over architectural values.
- Regulation E (7): No primary scenic views or scenic views from public streets or pedestrian trails shall be obstructed unless it is found that there is no feasible alternative siting which eliminates or significantly reduces the obstruction. In such cases, the bulk and scale of the proposed structure shall be minimized to the greatest extent feasible commensurate with preserving the physical characteristics of the site.
- Regulation E (8): In order to maximize and preserve natural open space, natural open space, natural landforms and views projects involving more than one dwelling unit on a lot shall be clustered on the flatter portions of the site, if determined to be practicable and desirable. "Clustering" in this context shall mean the siting of dwelling units in proximity to each other so as to maximize the amount of undeveloped open space. A clustered project within this overlay zone may disregard existing interior lot line and is not bound to comply with the minimum lot size, width, depth and setback provision of the underlying Del Mar Zoning Ordinance. A suitable site plan showing the clustered proposal shall be submitted for subdivisions and multiple unit construction projects in this overlay zone.

3 PROJECT SETTING

The Project is located in north coastal San Diego County in the City of Del Mar (Figure 1). The Project site is located atop a relatively flat mesa and noticeable bluff –top that encompasses a triangular shaped portion of land located in the northwestern corner of Del Mar. The bluff-top Project site overlooks the Pacific Ocean and features descending slopes on its west, east, and south sides. On-site elevations range from approximately 93 feet mean sea level (MSL) in the northern portion of the site to approximately 0 feet MSL at the base of cliffs along the western site boundary.

Photographs of the Project site and surrounding area are referenced below as support for the description of the Project setting. The location of the referenced photographs is depicted on Figure 8, Project Setting Photographs Key Map, which includes the boundaries of the City of Del Mar and City of Solana Beach for clarity.

Bound by Border Avenue/South Sierra Avenue to the north, Camino Del Mar to the east, North Beach to the south, and beach and ocean to the west, the fenced, approximately 16.6-acre Project site is comprised of eight parcels. Seven of the eight parcels are currently vacant. The northernmost portion of the Project site previously supported residential buildings that have been removed and currently consists of open land with scattered ice plant and grasses. The elevation gradually rises from east to west across the site and several mature palm trees and three abandoned telephone poles and lines also dot the northernmost portion of the Project site (see Photo A on Figure 9, Project Setting [1 of 5]). The property abuts Border Avenue and a two-story condominium development on the north (Del Mar Beach Club; see Photo B on Figure 9). A narrow view access easement is also located between the property and the two-story condominium development however, no coastal access is provided via the wood-chipped covered easement. In addition, the property is occasionally used for overflow parking for beach and other local events. The central portion of the Project site previously supported residential homes and ancillary structures that have been demolished. Mature trees and other landscaping line the northern, southern, and western boundaries of the central portion of the site (fencing is also installed along the perimeter) and grasses, exposed soils, and gravel typically cover the site interior (see Photo C and Photo D on Figure 9).

The southernmost parcel of the Project site is supports an occupied 5,800-square-foot single-story residence and guesthouse with a pool. Photo E on Figure 10, Project Setting (2 of 5), includes the residence, roof of the guesthouse, landscaping, and pedestrian paths. The residence is setback from the bluff but the property provides long and broad views south and north along the coastline and to the west. Photo F on Figure 10 that depicts a southerly view from the southern portion of the Project site. The parcel is landscaped with turf, iceplant, various shrubs, and tall and mature pine (*Pinus* sp.), cypress (*Cupressus* sp.), and palm trees (*Phoenix canariensis*; *Washingtonia robusta*). Photo G on Figure 10 depicts landscaping installed along the southern boundary of the Project site

as viewed from the James G. Scripps Preserve Bluff. Access to the property is provided from a private access road that serves the adjacent central portion of the Project site property. The access driveway parallels Camino Del Mar and runs perpendicular to Border Avenue (see Photo H on Figure 10). The access driveway is approximately 20 feet wide and lined by cypress and other mature trees on the west and pine and other trees and shrubs on the east. Limited public access currently exists north of the northernmost Project boundary.

The location of the Project site, development in the surrounding area, and major natural and built features are depicted in Figure 1. Residential and commercial land uses in Solana Beach border the Project site to the north. The residences are primarily two-story multifamily developments including the gated Del Mar Beach Club that is located west and east of South Sierra Avenue. A low, beige masonry wall topped with short metal bars is situated atop a 25-foot wide slope landscaped with groundcover and a few tall pine and paperbark (*Melaleuca quinquenervia*) trees located west of South Sierra Avenue (see Photo I on Figure 11, Project Setting [3 of 5]). This fence lines the eastern extent of the Del Mar Beach Club development. Attached homes within the development consist of two-story boxy structures featuring a beige/off-white stucco exterior and flat, wood-shingled roofs. Homes to the east across South Sierra Avenue display similar design elements including landscaping. A three-story office building is located east of the residential development and west of Highway 101. The rectangular, light cream-colored stucco and natural-looking wood building is partially obscured from view by mature pine and *Podocarpus* sp. trees installed to the immediate south and east of the building (see Photo J on Figure 11). Located in Solana Beach, the stuccoed office development features terraces on the upper floors and a rectangular and flat roofline. Additional two- and three-story multifamily residential developments are located further north along South Sierra Avenue and include the green-blue and off-white painted wood and stucco exterior La Playa Del Mar buildings, the beige /nude stucco and flat, red tile roof Del Mar Shores buildings, and the wood-clad, asymmetrical, and angular roofline Seascape Chateau and Seascape buildings designed in the Shed architectural style, commonly built as second homes or primary residences in suburban areas of California between 1965 and 1990 (see Photo K on Figure 11).

Each of the development properties feature varying densities of landscaping including mature trees and tall hedges. Residential properties are consistently fenced along South Sierra Avenue.

In the City of Solana Beach, one- to three-story residential and commercial uses are located along the Highway 101 corridor and to the north of the office building. Development includes restaurants and shops in one- and two-story wood structures with long pitch roofs and rectangular glass windows and hotels operating out of warm, two and three-colored stucco exterior and red tile roof buildings (see Photo L on Figure 11). Further, the concrete and glass Solana Beach City Hall building, and the Beachwalk neighborhood retail plaza that features one- and two story buildings painted in browns, light green, or light gold colors are also located along the Highway 101 corridor on the southbound approach towards the Project site (see Photo M, Photo 12). As with residential uses, commercial and other development along Highway 101 are situated on properties with generally small or narrow

planters featuring turf, low shrubs, flowers, and tall trees including palm, pine, and conifers (i.e., *Podocarpus* sp). The City of Solana Beach General Plan designates the area to the north of the Project site and west of Highway 101 as Multi-family Residential (generally west of South Sierra Avenue) and Commercial and Office (east of South Sierra Avenue and west of Highway 101.

North Beach and the mouth of the San Dieguito River (i.e., location where river flows into the Pacific Ocean) is located south of the Project site. The eastern portion of the beach adjacent to Camino Del Mar features posts for volleyball nets and a native demonstration garden. The southern portion of the beach is open and popular with local residents and dog owners (see Photo N on Figure 12, Project Setting [4 of 5], that depicts the mouth of the San Dieguito River, North Beach, and the Project site). Public access to the James G. Scripps Bluff Preserve is provided via North Beach and a paved access path is constructed into the east-facing slope of the bluff landform visible in Photo N. The south- and east-facing slopes of the bluff are covered with low, coastal sage scrub vegetation that displays tones of brown, grey and green. Tan exposed soils are also evident on the bluff slopes visible from Camino Del Mar and the visible trees atop the bluff are located on the Project Site. A private, beachfront residential development is located to the south of North Beach and west of Camino Del Mar. North and south of the river crossing, public beach parking is available along Camino Del Mar, a two-lane road with a raised median that features low grasses, shrubs, and near the Project site, mature pine trees.

A local restaurant and a surface parking lot are located east of Camino Del Mar. The restaurant (the Brigantine) is situated atop a bluff overlooking the San Dieguito Lagoon (see Photo O on Figure 12) and a local rail corridor to the south and east. Condominium development is located further to the south (south of the San Dieguito Lagoon) and the Del Mar Fairgrounds are located southeast. Tall palm trees are planted along the property frontage of Camino Del Mar and shorter palms and low, flowering shrubs occupy narrow planters that line the sidewalk The restaurant and underlying bluff is located approximately 40 to 50 feet higher in elevation than the lagoon and Fairgrounds. Notable visual elements of the Del Mar Fairgrounds include the wide oval shaped, turf and dirt track with water features and collection of single-story buildings in the infield, the large, multistory Mission style offices and grandstand building, and the many long, rectangular stable buildings (see Photo P on Figure 12). Vegetation on the fairgrounds property is scattered and somewhat limited; however, the inner track is planted with turf, trees, and shrubs surrounding the interior water features. North-south railroad tracks are located east of the lagoon and west of the fairgrounds. North of Viae la Valle and in the City of Solana Beach, the tracks are located at a lower elevation than lands to the west and east. Seven boxy and white painted stucco exterior, two-story residential homes in the City of Del Mar are located east of the restaurant and railroad tracks and immediately south of Via de la Valle. The small bluff-top development is gated and in addition to palm trees and bird of paradise plantings, a six-foot high, lightly colored masonry wall borders the development on the north (see Photo Q on Figure 13, Project Setting [5 of 5]).

Additional single-family and multifamily residential development is located north of Via de la Valle in Solana Beach and the local terrain rises from south to north and west to east, creating opportunities for ocean view lots and terraced residential development (see Photo R on Figure 13). Scenic views to the Pacific Ocean are available from these higher elevation residential areas in Solana Beach including condominiums off Solana Circle and single –family homes located off East and West Solana Circle (see Photo S on Figure 13). Residential developments incorporate tans to bluish stucco and grey to brown wood exteriors, flat to slightly pitched wood shingle or tiled roofs, stone and/or brick accents, and large to small expanses of glass windows on elevations (see Photos S and T on Figure 13). Architectural styles of individual multifamily developments and single-family homes vary. Residential properties are landscaped with turf, low shrubs and hedges, and trees including palm, pine, and occasionally, coral (*Erythrina* sp.), eucalyptus, and pepper trees. Relative to apartment or condominium uses, single-family residential lots tends to include a more diverse assortment of shrubs and trees.

4 VIEWER GROUPS, RESPONSE AND EXPOSURE

Because the Project site is located atop a noticeable bluff and due to the characteristics of topography within the surrounding area, views to the Project site are available throughout southern Solana Beach, northern Del Mar, and from bluff-top homes in the City of San Diego. In addition, the Project site is visible from North Beach and other local beaches, trails within/near the San Dieguito Lagoon River, Interstate 5 (I-5) and from parks and local roads. Viewer groups with a view to the Project site include residential viewers (Del Mar, Solana Beach, and City of San Diego), motorists on I-5, Camino Del Mar, Via de la Valle and various local roads, and recreational groups including trail users, beach and park goers, and surfers, kayakers, and others recreating in the ocean. Other groups provided views to the Project site include visitors to the Brigantine restaurant and workers at the nearby office complex to the north, rail users (i.e., Coaster and AMTRAK riders), and persons attending events at the Del Mar Fairgrounds.

While the discussion below describes the general availability of views to the Project site in the surrounding area, select key public views have been identified to assess the potential visual impacts including view blockage of the Project.

4.1 Residential Groups

Within the City of Del Mar the nearest residence provided views to the Project site is located approximately 330 feet to the east at 103 Via de la Valle. Despite the proximity, private views to the Project site from the residence may be obstructed by private yard landscaping in the foreground and by intervening landscaping located within the railway corridor and along the eastern boundary of the Project site. Approximately eight homes are located east of this residence (and south of Via de la Valle) and may be provided views to the Project site from west-facing windows on the second story of homes however; these private views may be partially obstructed or blocked by intervening landscaping. Residences are also located to the south of North Beach and south of the mouth of the San Dieguito River. Residences within the gated Sandy Lane development are located as close as 600 feet from the southern portion of the Project site and homes are located approximately 50 feet or lower in elevation than the bluff-top portions of the Project site. Generally, the residences are constructed close to one another and have small, narrow side yards. Due to the close proximity of neighbors to the north and south, valued views from the majority of residences in the Sandy Lane development tend to be to the west towards the Pacific Ocean. With the exception of the northernmost residences in the development, northward views towards the Project site may be regularly blocked from residences by intervening development and landscaping located on adjacent properties in the foreground. Due to the partially to fully screened nature of views toward the Project site due to intervening topography, vegetation, and/or distance, some residential viewers are expected to have moderate to low sensitivity.

Views to the Project site extend to the south and southeast of the Sandy Lane development and are be available at residential properties to the west and east of Camino Del Mar. With the exception of two or three-story multifamily residential development with available and unimpeded northerly views, the Project site is screened from view from the majority of homes due to the presence of intervening residential development, private yard landscaping and street trees located in the foreground and middle ground. Views to the Project site generally extend to the southern extent of the San Dieguito Lagoon and to homes located off Racetrack Drive. A small, 23 home single-family residential development is located near the eastern terminus of Racetrack Drive. From these residences the Project site is located in the background of available views and the presence of tall and mature Torrey Pines in the foreground may somewhat obscure longer views to the northwest. South of Coast Boulevard, the local topography rises and the landform to the east of Camino Del Mar consists of a locally prominent hill. Residential development climbs the west-facing slope of the hill and private lots are provided sweeping views to the north, west, and southwest. Hillside homes provided elevated and relatively clear vantage points to the Project site are located within 0.65 miles of the ocean bluff underlying the Project site. While visible from these elevated residences, the Project site is generally located in the background of the visible landscape and as a result, details and changes occurring on the Project site are somewhat muted and difficult to detect.

The nearest residential viewers in Solana Beach are located to the immediate north of the Project site. While residents in the southern portion of the private Del Mar Beach Club are provided foreground views to the Project site, residential buildings in the central and northern areas of the development are provided partially to fully screened southerly views. As experienced from these residences, neighboring residential development and landscaping in the foreground obscures the Project site from view. For similar reasons, the Project site is obscured from the majority of residential development to the north of the Del Mar Beach Club and west of South Sierra Avenue. However, the topography of southern Solana Beach rises to the east and northeast away from the Project site and creates a noticeable hill to the north of Via de la Valle and west of Stevens Avenue. Nardo Avenue somewhat functions as a "ridgeline" to the locally prominent hill and several residential developments to the west and southwest of Nardo Avenue are provided elevated and relatively unimpaired views to the Pacific Ocean and the Project site. For example, homes constructed off West Solana Circle are oriented to the west and are situated at an elevation of 150 feet to 170 feet. The residences are located within 0.35 miles of the north portion of the Project site that lies some 70 to 90 feet lower in elevation in the middle ground of the visible landscape. As experienced by these residences from elevated vantage points, clear views to the Project site are available and visual change occurring in the middle ground (including potential view blockage) would be particularly noticeable. The local terrain falls to the west of West Solana Circle and therefore, homes constructed to the west are located below the line of sight to the Project site. Lastly, middle-ground views to the Project site are provided to select homes constructed atop hilly terrain off Sea Turf Circle, Shoemaker Court, and Cofair Court.

Within the City of San Diego, views to the Project site are limited but extend to homes lining the San Dieguito River Valley and homes to the east of El Camino Real through the river valley. For example, homes off Ocean Vista Road, High Bluff Drive, and Landfair Road are constructed on elevated, ridgetop terrain overlooking the river valley. Views from private yards and High Bluff Drive are expansive and include the river valley, I-5 corridor, San Dieguito Lagoon, Del Mar Fairgrounds, Project site, and Pacific Ocean. As experienced from these homes and High Bluff Drive, the Project site is located in the background of the visible landscape and details and changes occurring on the Project site are somewhat muted and difficult to detect. The homes are located over two miles from the Project site and are situated at an elevation of between 300 and 315 feet (the highest point on the Project site is 93 feet). Descending slopes are located to the north of residential development off Ocean Vista Road, High Bluff Drive, and Landfair Road and the elevated vantage points and lack of intervening development between ridgeline residential development. While visible, the Project site is located in the background of the visible landscape and details on the Project site are difficult to detect. As El Camino Real descends the elevated terrain of the Del Mar Highlands area and enters the San Dieguito River Valley, development disappears from the foreground to the west. Westerly views towards I-5 and the coast consist of an undeveloped river valley. Homes to the east of El Camino Real are provided views that include the distant Project site in the background. Due to distance, details and changes occurring on the Project site as experienced from these residences are somewhat muted and difficult to detect.

Due to the private nature of views, the partially to fully screened nature of views of existing features on the Project site, and the availability of views to coastal and lagoon resources in the area, residential viewer are considered to be highly sensitive to changes occurring in the Project viewshed.

4.2 Motorist Groups

Interstate 5

The viewshed of the Project site extends to the east across the San Dieguito River Valley and encompasses an approximately 1.2 mile long segment of northbound I-5 as it descends elevated terrain located north of Del Mar Heights Road, traverses the river valley and approaches Via de la Valle. However, north of the San Dieguito River span, long westward views from I-5 are significantly shortened in length by the presence of fairground buildings in the middle ground and later, by hotel development and landscaping in the foreground. Between Del Mar Heights Road and Via de la Valle, average daily traffic on I-5 is over 250,000 vehicles (Caltrans 2018). Outside of peak hours, prevailing travel speed is approximately 65 to 70 miles per hour (travel speeds are substantially reduced during morning and evening peak hours). The segment of I-5 within the Project viewshed is located over 1.2 miles from the Project site. While the Project site is located in the background of the available view, the flat bluff and the dense grouping of mature trees are at times distinct in westerly views across the San Dieguito River Valley and beyond fairground development.

Assuming a prevailing travel speed of 65 miles per hour, views to the Project site are available for approximately 66 seconds over the 1.2-mile segment of the interstate included in the Project viewshed. However, the Project site occupies a small percentage of the westward view available to motorists and passengers and the foreground river valley landscape tends to dominant the visual environment. As a result, motorists and passengers are often attracted the elements in the foreground as opposed to elements in the background including the Project site. Lastly, interstate motorists and motorists in general tend to focus on the road instead of fixating on specific points or features in the landscape.

Due to the factors discussed above, the exposure of interstate motorists and passengers is moderate and sensitivity is reduced the distant location of the Project site in the available view and competing elements of interest in the foreground and middle ground (i.e., fairgrounds buildings) of the interstate.

Camino Del Mar

Camino Del Mar is the major north-south route through Del Mar. North of the San Dieguito River, the two-lane divided road features parallel and diagonal street parking and a bike lane adjacent to the southbound travel lane. North of the river, bike lane and parallel street parking are also available in the northbound direction. The western boundary of the Project site is within 20 feet of Camino Del Mar however, near the native demonstration garden at North Beach, the site is approximately 60 feet higher in elevation than the surface of the road. North of the demonstration garden, Camino Del Mar rises in elevation such that near the intersection with Via de la Valle, Camino Del Mar is approximately 5 feet lower in elevation than the northeast corner of the Project site. 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 27th Street) on a typical weekday is approximately 15,300 vehicles (LLG 2019). Near the Project site, the posted speed limit on the road is 30 mph.

The Project site is visible to northbound and southbound motorists on Camino Del Mar. On the northbound approach, the Project site is briefly visible at the Camino Del Mar/Jimmy Durante Boulevard intersection. Specifically, the background bluff top (located 0.90 miles away) is noticeable over an approximate 370-foot long segment of the road. Along this stretch, views are available for approximately 8 seconds assuming a travel speed of 30 mph. Beyond this segment, the Project site is abruptly obscured from view as the elevation of the road descends and homes and trees shorten the length of the available northward views. The slopes along the eastern Project site boundary are visible from as far as approximately 25th Street (approximately 0.6 miles away from the Project site) and a larger portion of southernmost area of the bluff landform is revealed to motorist at the San Dieguito River Bridge. From the bridge north, the Project site is visible in the foreground from northbound Camino Del Mar over an approximate distance of 0.40 miles.

Assuming travel speed of 30 mph, views are available for approximately 50 seconds. While views of the Project site are available, the San Dieguito River, ocean, San Dieguito Lagoon and Del Mar Fairgrounds all compete with the Project site for the attention of motorists and passengers. In addition, as Camino Del Mar climbs in elevation near the demonstration garden, a line of twelve (12) mature trees installed in the Camino Del Mar median briefly obscures views to the Project site and along this segment, the close proximity and elevation of the bluff landform obscures the central, northern, and western portions of the Project site from view. Near the Brigantine restaurant, the central median breaks and median plantings are no longer present. Despite the lack of median plantings, the dense line of cypress trees installed along the eastern boundary of the Project site and approximately 100 feet of motorists limits the availability of views to the interior of the site from northbound Camino Del Mar. The combination of this low exposure with the potential for more sustained exposure of the Project parcels when traveling north along Camino Del Mar results in a moderate level of exposure for northbound travelers. Sensitivity is equally moderate, as there are many competing elements in the view.

The northeastern corner of the Project site is visible to southbound motorists as Highway 101 passes through the Via de la Valle intersection and enters City of Del Mar boundaries and becomes Camino Del Mar. However, as previously discussed, south of the intersection the line of mature cypress trees installed along the eastern site boundary screens the interior of the Project site from view of Camino Del Mar motorists. Due to proximity to the Project site, westward views from southbound Camino Del Mar fully encompass the steep east-facing slopes of the bluff landform and views beyond the elevated eastern edge of the Project site are not available. The southbound travel lane of Camino Del Mar parallels the Project site for approximately 0.20 miles and motorists are within the Project site viewshed for approximately 24 seconds (assuming a travel speed of 30 mph), available westward views consists of steep sloped terrain and the crowns of mature trees atop eastern boundary of the bluff.

North of Via de la Valle, Camino Del Mar becomes Highway 101 and proceeds north through the cities of Solana Beach and Encinitas. While the Project site is outside of the normal field of vision of northbound motorists as they pass through the Highway 101/Via de la Valle intersection, the Project site is briefly visible (i.e., for approximately 4 seconds assuming 30 mph travel speed) to southbound Highway 101 motorists. South of Dahlia Drive and on the approach to Via de la Valle, the presence of one- and two-story commercial, hotel, civic, and office development, and street trees located west of the road screen the Project site from view of southbound Highway 101 motorists. However, at the Highway 101/Via de la Valle intersection, the northern portion of the Project site is visible to the first three to four cars queued in the three southbound travel lanes. As experienced from the southbound travel lane and during a red light, view exposure would be greatest for the first three to four cars queued in the three southbound travel lanes. Due to generally low exposure of the Project site combined with the opportunity for more sustained exposure for a small number of viewers (the first three to four vehicles queued at the intersection), exposure is moderate to low for southbound travelers. Sensitivity

is considered low for southbound travelers, as there are many competing elements in the view and, with the exception of the Camino Del Mar/Via de la Valle intersection, the Project site is generally outside of the normal field of view, as it is either directly west or at the backs of southbound motorists as they travel along Camino Del Mar.

Via de la Valle

Via de la Valle serves as a major east-west access corridor between southern Solana Beach, northern Del Mar, and Interstate 5. At its intersection with Highway 101, Via de la Valle is situated at an approximate elevation of 60 feet amsl, which is approximately 2 to 3 feet lower than the northeast corner of the Project site located approximately 150 feet away. Based on traffic counts conducted as part of the Traffic Impact Analysis prepared for the Project, average daily traffic on Via de Valle near the Project site (S. Cedros Avenue to Jimmy Durante Boulevard) on a typical weekday is approximately 18,800 vehicles (LLG 2019).

Due to the characteristics of local terrain, the Project site is screened from westbound Via de la Valle motorists east of Solana Circle. West of Solana Circle (i.e., approximately 0.28 miles west of the Project site), mature trees and a sliver of previously disturbed lands comprising the northern portion of the Project site are generally visible in the middle ground. As measured from Solana Circle to the west, these features of the Project site remain visible for approximately 24 seconds assuming a 40 mph travel speed. Due to the narrow view available through the Via de la Valle corridor, private yard landscaping tends to attract the attention of westbound motorists and passengers on Via de la Valle. In addition, due to the screening effects of landscaping in the foreground, the visible sliver of the northern portion of the Project site represents a small percentage of the available view. Further, with the exception of an approximate 175-foot long segment of Via de la Valle between the bridge span over railroad tracks and Highway 101, the central and southern portions of the Project site are entirely screened from view of westbound motorists by mature landscape trees and residential development in the foreground of the visible landscape. At the bridge span, available views to the west encompass the road corridor and the rising terrain of the northern portion of the Project site. At the bridge, views to the southwest look across the Brigantine restaurant parking lot and Camino Del Mar to existing trees on the southern portion of the Project site in the middle ground. The cluster of cypress trees along the site's eastern boundary are also noticeable and partially block the central portion of the Project site from view. Exposure to views of the Project site is elongated when cars begin to queue at the Via de la Valle/Highway 101 intersection such as during a red light event. At the intersection, the Project site is located in the foreground and while partially screened from view by trees planted along the eastern boundary, the Project site occupies a substantial portion of the visible landscape to the west. Excluding the potential to be stopped at the Via de la Valle intersection with Highway 101, motorists generally have relatively low exposure.

The Project site is located outside of the normal field of vision for eastbound motorists on Via de la Valle. Much of the road (east of Solana Circle) does not have views of the Project site, and eastbound travelers have the site at their back, and therefore do not have views toward the Project site. Therefore, for purposes of this report, eastbound Via de la Valle motorists are not considered to have views to the Project site.

The combination of this low exposure with the potential for more sustained exposure when stopped at the northeast corner of the Project parcels results in a moderate level of exposure. Sensitivity is equally moderate, and many of the viewers may be locals with frequent views of the site, while viewers on this primary roadway may be passing through with no expectations.

Jimmy Durante Boulevard

Jimmy Durante Boulevard is a primarily north-south corridor that roughly parallels Camino Del Mar before extending east over the San Dieguito River and along the eastern perimeter of the Del Mar Fairgrounds. Near its confluence with Camino Del Mar, Jimmy Durante Boulevard is situated at an approximate elevation of 55 feet amsl. North of this point and as the northbound travel lane approaches the San Dieguito River Bridge, the elevation of the road gradually decreases and ultimately reaches a low point of approximately 8 feet amsl at the intersection with San Dieguito Drive. Jimmy Durante Boulevard is a two-lane road with a raised median and sidewalk paralleling the northbound lane between Camino Del Mar and the San Dieguito River Bridge. North of the bridge, the road expands to four lanes, include sidewalks adjacent to north and southbound travel lanes and a wide (approximately 20 feet) painted median. Based on 2018 traffic counts conducted by the City, the average number of vehicles per hour on northbound Jimmy Durante Boulevard (238) as measured at the bridge is noticeably greater than the average number of vehicles per hour on southbound Jimmy Durante Boulevard (137) at the bridge (City of Del Mar 2018).

Limited background views to the Project site are available to northbound Jimmy Durante Boulevard motorists at and near the confluence with Camino Del Mar and at the San Dieguito River crossing. With the exception of at the river crossing, southbound motorists are not provided views to the Project site. Near Camino Del Mar as the road descends into the San Dieguito River valley, the crowns of tall trees on the Project site are somewhat detectable in the background but not overly distinct in the available northward view. Partially obscured background views to the Project site are available for approximately 9 seconds over a distance of 400 feet and as experienced from this segment, vegetation on the Project site occupies an extremely small portion of the landscape. North of this short segment, mature pine trees planted in the Jimmy Durante Boulevard median in the foreground and intervening development and landscaping to the northwest in the middle ground block the Project site from view. On the San Dieguito River Bridge, the Project site (located 0.60 miles away) is visible for approximately seven seconds in the background of the available northwestward view. While visible, the bluff landform occupies a relatively small portion of the

visible landscape and foreground elements including the San Dieguito River and the distinct hall and grandstand buildings at the Del Mar Fairgrounds tend to dominate the northwestward view. East of the river crossing, long, one- and two-story buildings (and eventually, the grandstands) at the Del Mar Fairgrounds enter the foreground and block the Project site from view. Similar brief views to the Project site lasting less than 7 seconds are available to southbound motorists on the bridge span. However, as experienced from the southbound travel lane, the Project site tends to be located in motorists' peripheral view and is then outside of the normal field of vision south of the San Dieguito River along the approach to downtown Del Mar. Therefore, viewer exposure is relatively low due to numbers of roadway users and the short duration of time in which the site is visible at a distance. Similarly, the distance of the site from the viewers, combined with competing view elements, results in traveler sensitivity being relatively low.

Local Roads

In addition to the major transportation corridors and routes listed above, the Project site is visible from a number of local roads in the cities of Del Mar, Solana Beach, and San Diego. For example, partially screened views of the Project site are available from westbound San Dieguito Drive and narrow roads on the west-facing slope of prominent terrain developed with single-family residences to the southeast. Roads to the north and northeast of the Project site in Solana Beach including Border Avenue and South Sierra Avenue offer unobstructed foreground views to the northern and central portions of the Project site. For example, Border Avenue parallels the northeastern portion of the Project site for approximately 350 feet and for approximately 8 seconds, the Project site occupies a substantial portion of the available southward view. North of the Project site, Border Avenue turns into South Sierra Avenue and the road is aligned perpendicular to the Project site for approximately 0.80 miles. While visible from southbound South Sierra Avenue, the Project site occupies a small percentage of the view and is generally indistinct north of Del Mar Shores Terrace (located 0.15 miles north of the Project site). South of Del Mar Shores Terrace, the Project site is centrally located in the view and increasingly dominates the landscape as motorists approach Border Avenue. Motorists on Highway 101 and South Cedros, southbound Solana Circle (for approximately 140 feet) and East and West Solana Circle are also provided fleeting foreground and middle-ground views to the Project site that are partially screened by intervening development and landscaping to open and unencumbered. Within the City of San Diego, High Bluff Drive and El Camino Real (between approximately Derby Downs Road and the southern parking lot of the Harvest Evangelical Church (a distance of 0.60 miles) provide motorists longer distance background views in which the Project site occupies a very small portion of the visible landscape. At its closest point, High Bluff Drive is situated at an elevation of approximately 330 feet amsl and 2.1 miles to the southeast of the Project site. El Camino Real (at its closest point) is situated at an elevation of 45 feet amsl and located approximately 1.8 miles to the southeast of the Project site. Viewer exposure from local roads is considered moderate, due to the combination

of areas with intervening development and distracting elements in the view and areas with open, unencumbered views to the Project site. Sensitivity is considered low to moderate, as there are multiple competing elements in the view and the Project site generally composes a small percentage of the available views; however, the Project site is dominant in the view along some portions of local roads.

4.3 Recreational Groups

The viewshed of the Project site encompasses several recreational areas in the surrounding environment including bluff tops and overlook parks, beaches and open water, and trails. For example, trails and vista points within the James G. Scripps Bluff Preserve are located to the immediate south and on the same bluff top as the Project site. The trails and westerly oriented vista points are accessible via a set of existing stairs located along the northwestern boundary of North Beach and a long paved pathway that climbs the east-facing slope of the bluff from south to north. While the southernmost portion of the Project site is visible to recreationists from the bluff preserve in the foreground and occupies a substantial portion of the visible landscape to the north, preserve benches are generally oriented to the south and west towards the coastline and ocean. In addition, approach trails lead to an approximately 170 foot long trail that parallels the western edge of the bluff top. Both the vista points and bluff top trail provide long, wide, and unencumbered views to the south and west and therefore, the valued views from the bluff preserve are assumed to be to the south and west. Recreationists at vista points and along the bluff top trail are considered to be transitory receptors however, these receptors are assumed to have moderate to high sensitivity to changes to visual resources that make up the valued coastal and ocean views.

Located adjacent to the James G. Scripps Bluff Preserve, north of the San Dieguito River mouth, and west of Camino Del Mar, the City of Del Mar's North Beach is a popular beach for recreation (primarily volleyball) and dog owners. The City permits dogs to be leash free on city beaches nine months of the year. Elevations on the northern triangle-shaped portion of North Beach bound by the preserve, San Dieguito River mouth, and Camino Del Mar range from approximately 6 to 10 feet amsl and vista points and trails atop the James G. Scripps Bluff Preserve are situated at an elevation of approximately 47 and 57 feet amsl. As such, foreground views to the southern portion of the Project site and the south- and east-facing slopes of the underlying bluff are available to recreationists and dog owners at North Beach. As these viewer types are considered to be temporary receptors (i.e., views are available during their duration of visit to North Beach), view exposure is considered to be temporary. In addition, the primary purpose of recreationists and dog owners in visiting North Beach is assumed recreational activities as opposed to general scenic enjoyment. Therefore, recreationists and dog owners at North Beach are considered to have low to moderate sensitivity to changes to visual resources.

Stretches of ocean to the west and southwest of the Project site provide water-based recreationists (swimmers, surfers, stand-up paddle boarders, boaters and other) primarily low-angle views to the western slope of the bluff top underlying the Project site. Landscaping along the western edge of the bluff top on the Project site is visible to these receptors and the extent of views to the Project site tends to widen with increases in distance from the shoreline. With the exception of the western edge of the bluff top, foreground and middle-ground views to the Project site available to water-based recreationists are limited and experienced over a temporary duration. While focused on the ocean and their recreational activities, the sensitivity of these receptors to changes in visual resources is assumed low to moderate.

Several trails in the Project area provide trail-based recreationists opportunities and views to the San Dieguito River and Lagoon and Project site. Extending north from Jimmy Durante Boulevard near the San Dieguito River bridge, the River Path is situated atop the southern bank of the river. The river path provides pedestrian access between Jimmy Durante Boulevard and Camino Del Mar. The approximately 0.40-mile segment of the path located north of Jimmy Durante Boulevard (the path extends to the south of the boulevard) provides pedestrians opportunities for relatively clear and temporary middle-ground views to the east-facing slope and landscaping atop the Project site. In addition, the southern terminus of the Solana Beach Coastal Rail Trail provides opportunities for southbound pedestrians and runners to view the northern portion of the Project site. The series of arches at the southern terminus of the Solana Beach Coastal Rail Trail are located approximately 170 feet to the northeast of the Project site. As experienced from this location, relatively unencumbered foreground views to the northern portion of the Project site are available and the site occupies a relatively large portion of the available southward view. However, view exposure and sensitivity of coastal rail trail users is considered temporary and low to moderate.

Lastly, the elevated Project site is visible from trails in the San Dieguito River Lagoon including the low-lying Coast to Crest Trail (west of I-5 the average elevation of the trail is approximately 9 feet amsl) and the Dust Devil Nature Trail (located east of I-5). The Coast to Crest Trail passes beneath I-5 and roughly parallels the northern bank of the San Dieguito River for approximately 0.75 miles to Jimmy Durante Boulevard. Due to its elevated location atop a prominent coastal bluff, the Project site visible above Del Mar Fairground building from portions of the trail. Views from the trail are experienced over a temporary duration by recreationists (walkers, hikers, and trail-runners) and users are considered to have moderate sensitivity to changes in the visual environment. The Dust Devil Nature Trail is approximately 1.75 miles long and consists of three intersecting loops (North, East, and West) that provide views of the San Dieguito Lagoon east of I-5. A staging/parking area is provided off El Camino Real and the eastern extend of the North Loop Trail and from this trail, recreationists can access the East and West Loops. While the topography of the Project site is detectable across the San Dieguito Lagoon, I-5 and above Del Mar Fairgrounds buildings, the Project site is located over 1.5 miles from the nearest trail segment and in the background of the available view. As such, the

distant Project site is not a dominant feature in westward views available from the Dust Devil Nature Trail. At the southwesterly oriented lookout point located at the westernmost extension of the West Loop trail, the Project site is located approximately 1.6 miles to the northwest and in the background of the visible landscape. Views from the loops trail are experienced over a temporary duration by recreationists (walkers, hikers, and trail-runners) and users are considered to have moderate sensitivity to changes in the visual environment.

Located in the City of San Diego and paralleling High Bluff Drive, Overlook Park is comprised of three irregularly shaped turf areas lined (and connected by) concrete paths. Overlook Park is bordered on the northwest by low and mounded flowering shrubs and wood, post and rail fence that is installed along the nearby bluff's edge. The turf areas and paths are situated at elevations ranging from 320 to 325 feet amsl and provide wide views to the north and northwest, across the San Dieguito River and to rising, developed and undeveloped terrain to the north of Via de la Valle, the Del Mar Fairgrounds and the Pacific Ocean. While located over 2 miles away and in the background of the available view, the Project site is located at a lower elevation than Overlook Park and is visible due to its elevated, bluff top location. View exposure to recreationists at Overlook Park is temporary and viewers are considered to have moderate to high sensitivity to changes to resources that make up the existing view. However, due to distance and competing features in the available broad view, visual change occurring on the Project site would be obscured and may be difficult to detect.

4.4 Commercial Groups

Commercial groups provided views to the Project site consist of nearby office employees, customers at the Brigantine restaurant, and customers of third-story shops and restaurants at the Del Mar Plaza.

A three-story office building is located at the northwestern concern of the Highway 101/Via de la Valle intersection and approximately 70 feet north of the Project site. As described in Section 2.1, above, the natural-looking wood building is partially obscured from view by mature pine and *Podocarpus* sp. trees installed to the immediate south and east of the building. In addition to partially screening the structure, existing landscaping partially screens the Project site in views from windows along the south and west elevations of the building. Employees are provided views to the Project site as they travel on Via de la Valle and Border Avenue to access the building's surface parking lot (approximately 40 spaces are available). However, views are experienced over a temporary duration and as a specific viewer group, office employees are considered to have a low to moderate sensitivity to visual change in the surrounding area.

The Brigantine restaurant is located west of Camino Del Mar and approximately 130 feet from the Project site. From the restaurant's parking lot adjacent to Camino Del Mar, customers are provided

westerly foreground views to the low, east-facing slope comprising the easternmost boundary of the Project site. Foreground views to the Project site are also available through windows constructed on the west elevation of the restaurant building however, these views are limited in number and inside diners are likely more inward focused than outside diners seated on the restaurant's outside patio. The Project site is visible in the foreground of views available from a small outdoor seating area constructed off the building's south elevation, however, the visible landscape also includes the Del Mar Fairgrounds and thus, the Project site is not a focal feature in the available view. Further, as customers are more likely to be attracted to the wider and more diverse views to the Del Mar Fairgrounds or focused inwardly on their dining companions, westerly foreground views to the Project site are not considered to be particularly valued by customers for purposes of this report. Additionally, a garden area is located on the east side of the building, facing away from, and without views to, the Project. Therefore, from the Brigantine restaurant, view exposure to the eastern portion of the Project site is temporary and viewer sensitivity is considered low.

4.5 Rail User Groups

North of the confluence of Camino Del Mar and Jimmy Durante Boulevard, the AMTRAK and NCTD rail corridor roughly parallels Camino Del Mar. Over an approximately 0.50-mile long segment of the track beginning at the San Dieguito River and continuing north, northbound AMTRAK and NCTD Coaster riders are provided westerly views to the Project site. At its closest point, rail track and riders are located within approximately 380 feet of the Project site. Over the approximately 0.50-mile long segment of track within the Project's viewshed, available views primarily encompass the east-facing slope and landscaping installed along the eastern edge of the bluff top. Due to generally high travel speeds and mobile nature of views from train cars, view exposure to rail users is brief. Viewer sensitivity for AMTRAK and NCTD Coaster commuters and leisure riders is therefore considered low to moderate.

4.6 Leisure Groups

The Del Mar Fairgrounds and nearby equestrian center are located approximately 630 feet east of the Project site and are bounded by Via de la Valle to the north, Jimmy Durante Boulevard to the east, Jimmy Durante Boulevard and the San Dieguito River to the south and the AMTRAK and NCTD Coaster rail corridor to the west. The terrain underlying the fairgrounds and equestrian center is generally flat and the average elevation across the 340-acre area is approximately 9 feet amsl. Managed and operated by the 22nd District Agricultural Association (22nd DAA), the fairgrounds and horse park host approximately 350 events each year. Events include those produced by the 22nd DAA (National Horse Show, San Diego County Fair, Scream Zone, and Surfside Race Place (off-site race book) and events/activities produced by companies that rent or lease facilities including horse races from July to September and in November, and consumer, trade and private events (Del Mar Fairgrounds 2018).

The Project site is visible from the westerly paved portion of the fairgrounds, grandstands, track infield, and the driveway and parking lot accessible through the Solana Gate. The Project site is primarily screened from view of fairgrounds visitors at the eastern paved parking lot off Jimmy Durante Boulevard by existing structures and landscaping constructed and installed to west and north of the parking lot in the foreground and middle ground. Specifically, the 3-story Surfside Race Place facility, the approximately 4 to 5 story Del Mar Arena, nearby palm trees, 2 to 3 story barn and expo center buildings, and the 5 to 6 story grandstands block the Project site from view of visitors at the easterly parking lot. Although views of to the Project site are available from publicly accessible locations within the Del Mar Fairgrounds, the views of visitors to the county fair, horse races and other popular events are generally focused inward on activities occurring at or on the fairgrounds property. Further, the views to the Project site available to fairgrounds visitors are temporary. Due to their primarily inward focus and brief duration of available views, leisure groups at the Del Mar Fairgrounds are considered to have low sensitivity to visual change occurring in the environment.

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5 KEY VIEW ASSESSMENT

5.1 Methodology

Because it is not feasible to analyze all the views in which the Project is visible, it is necessary to select a number of key viewpoints that clearly display the visual effects of the proposed Project. Key views generally represent the primary viewer groups that would potentially be affected by the Project. To determine the extent of available views to the Project site, Dudek created a viewshed analysis that included the Project site and surrounding area. The viewshed analysis used the height of Project buildings and on- and off-site terrain to present a graphical representation of the extent of available views to the Project site. However, the viewshed analysis solely references on- and off-site terrain in depicting the extent of available views to the Project site (elements including existing structures and vegetation that could impede off-site views to the Project site are not considered). Therefore, the viewshed analysis represents a worst-case scenario regarding the geographic extent of available views to the Project site. The viewshed analysis is provided as Figure 14, Viewshed Analysis.

Following completion of the viewshed analysis, Dudek performed a desktop-level review of candidate key view locations by using the Google Street View application. Seven candidate key view locations were identified by Dudek and included locations in the surrounding City of Del Mar and City of Solana Beach areas from which the public is provided views to the Project site. Once visibility to the site from candidate key view locations was confirmed, Dudek conducted a field investigation of the Project site and surrounding area and took photographs of the available view toward the Project site at each of the seven candidate key view locations. Photographs from each of the candidate key view locations were then shared with the applicant and City staff. Based on comments received by City staff, an additional five candidate key view locations were identified, and Dudek took photographs from each of these new locations. The original seven candidate key views and those added by the City compose the key views from which the Project is evaluated in this visual impact assessment. The location of the key views from which photo simulations of the Project were prepared and effects to existing views and visual character were assessed are depicted on Figure 15, Key Views. Further, the distance zones (foreground [FG], middle ground [MG] or background [BG]) and distance from each key view to the Project site is described in Table 2.

Table 2
Key View Distance Zones

Key View	Distance to Project Site	Distance Zone (FG/MG/BG)
Key View 1 – West Solana Circle (City of Solana Beach)	0.25 miles	MG
Key View 2 – South Sierra Avenue (City of Solana Beach)	130 feet	FG
Key View 3 – Via de la Valle at Highway 101	150 feet	FG
Key View 4 – Via de la Valle at South Cedros Avenue	450 feet	MG
Key View 5 – Del Mar Coastline northwest of North Beach	120 feet	FG
Key View 6 – Camino Del Mar (North of Lagoon Bridge)	230 feet	FG
Key View 7 – Camino Del Mar (South of Lagoon Bridge)	0.25 miles	MG
Key View 8 – Del Mar Coastline south of North Beach	0.3 miles	MG
Key View 9 – Jimmy Durante Boulevard at San Dieguito River Bridge	0.65 miles	MG
Key View 10 – Balboa Avenue (City of Del Mar)	0.8 miles	BG
Key View 11 – Camino Del Mar at Jimmy Durante Boulevard	0.9 miles	BG
Key View 12 – Del Mar Plaza Roof Deck	1.2 miles	BG
Key View 13 – James Scripps Bluff Preserve Trail	190 feet	FG

5.2 Photo Simulations

Three-dimensional (3-D) photo simulations of the Project on finished grade were prepared from each of the 13 key view locations. The 3-D simulations include existing site photographs taken by Dudek during field investigations as background images and true-scale 3-D models prepared in 3D Studio Max (a modeling and rendering software). Using available topography maps or digital elevation maps, a 3-D surface was created for the existing terrain, and then imported into 3D Studio Max. This 3-D surface was used to camera-match the background photos to the terrain model. 3-D models for the Project elements, including resort structures, graded slopes, retaining walls, roadway improvements, driveways, parking lots, fencing, and landscaping, were rendered onto the existing photographs. Landscaping is shown at estimated 10-year growth, and only facilities and elements visible to the 3-D model cameras were modeled by Dudek designers and appear in the photo simulations. These 3-D models were then merged into the 3-D scene at their finished grade elevations. Lighting was added to the scene to match the time of day the photographs were taken and to cast realistic shadows. Each view was rendered to a high-resolution image. The final product is a photorealistic before-and-after simulation that depicts the existing condition and the constructed Project and accompanying landscaping.

Visual simulations of the Project are conceptual in nature and reflect architectural characteristics and building materials that may be implemented. Design Guidelines established in the Specific Plan would govern development of the Project. Architectural guidelines would permit a mix of contemporary styles and a range of exterior materials and finishes including both natural and human-made material sources. Due to the range of architectural styles and building materials and finishes that would be permitted by the Specific Plan Design Guidelines, the final design of the Project may differ from the Project buildings depicted in the photo simulations prepared for this Visual Impact Assessment.

5.3 Key View Assessment

Key Views were analyzed for the potential contrast from existing to proposed conditions. The analysis below provides a discussion of existing and proposed conditions as viewed from each Key View, and

5.3.1 Key View 1 – West Solana Circle (City of Solana Beach)

Existing View

Key View 1 is located on West Solana Circle, near Solana Circle, and provides broad and long views to the south and west toward the Project site and the Pacific Ocean. Key View 1 is representative of views to the Project site available to nearby City of Solana Beach residents and motorists located on West and East Solana Circle atop locally prominent terrain. Further, a view corridor is identified in Exhibit 4 of the Solana Beach General Plan consisting of westerly, northwesterly, and southwesterly views from West Solana Circle (City of Solana Beach 1988). From Key View 1, the eastern boundary of the Project site is visible in the middle ground approximately 0.25 miles away and is situated at an elevation of approximately 60 feet above mean sea level (amsl). Key View 1 is situated at an elevation of approximately 165 feet amsl, and as such, panoramic coastal and ocean views are available from Key View 1 and along West Solana Circle (Figure 16a, Key View 1 – West Solana Circle [City of Solana Beach]).

As shown in the Key View 1 existing view (Figure 16a), the elevated vantage point available at Key View 1 provides motorists and a limited number of homes (approximately 10) long and broad ocean views that extend to the distant western horizon. Motorists traveling at 25 mph along West Solana Circle are afforded views to the coast and Project site for an approximately 0.25-mile stretch. Therefore, views available to motorists along this portion of West Solana Circle are available for approximately 36 seconds over an approximate distance of 0.25 miles at which point southbound West Solana Circle turns to the east and joins East Solana Circle. Exhibit 4 of the City of Solana Beach General Plan identifies the hilltop area near Key View 1 as a view corridor within the City of Solana Beach, with coastal scenic views to the west, northwest and southwest (City of Solana Beach 1988). At Key View 1, views extend beyond the sloped, grey and reddish tiled roofs of nearby multifamily

housing and the flat, white-topped roofs of office and residential development in the City of Solana Beach and to the southwest and west towards North Beach (obscured by tall palm trees) and the Project site. From Key View 1, the Project site appears as an elevated bluff with steep and vegetated southeasterly facing slopes and dense to, at times, clumped landscaping (primarily mature trees) on the southern portion in the middle ground of the view. While partially obscured by tall and spreading residential landscaping located east of Highway 101 and in the middle ground, the northern portion of the site gently climbs to the west and is covered by low golden grasses.

Analysis

The proposed mass, scale, and bulk of the proposed Project would be evident from Key View 1 and would create visual contrast compared to the existing visual character of the vacant and vegetated site Under existing conditions, the primarily vacant Project site is scattered with mature trees that shield the existing on-site residence from view. The Project includes resort structures that would appear as a cluster of rectangular buildings displaying flat rooflines. At Key View 1, viewers would be able to distinguish building materials on the facades of resort structures, including natural wood elements and glass windowpanes and partitions (see Figure 16b, Key View 1 – West Solana Circle [City of Solana Beach]). The flat roofline of the proposed structures would mimic the relatively flat topography of the bluff top and building colors would consist of warm tan, grey and brown earth tones found in the surrounding landscape.

As viewed from the elevated vantage point at Key View 1, the site coverage with the proposed resort development would be apparent. Similar to existing visible development in the view, portions of the resort development would be partially screened by existing and proposed landscaping that would help break up the bulk of the proposed buildings. Further, resort buildings would be partially screened by intervening development and vegetation, and scale and line contrasts would be relatively weak as viewed from Key View 1. The contrast in scale between Project structures and existing two and three-story development in the view would be relatively minor. It should also be noted that the City's municipal code identifies scenic views as "views of the ocean, lagoons, canyons, the community and its landscapes and urban forest character." The Project would result in an overall reduction in the site's natural appearance, vegetation and trees, which contribute to the community's landscapes and urban forest character. While protected trees that are proposed for removal as part of the Project would be appropriately mitigated, the Project would alter the existing visual character of the bluff-top landscape. Existing ocean views would be slightly changed in Kew View 1. However, these views to the ocean would not be substantially obstructed or altered because the panoramic views of the ocean would continue to dominate the scene. Additionally, the Project would be similar in bulk and scale to surrounding development as pictured in Key View 1; (see Figure 16b, Key View 1 – West Solana Circle [City of Solana Beach]). Therefore, although the Project would result in a contrast from the existing visual character of the site, it would not substantially degrade the existing views to the ocean or substantially degrade the visual character of the site.

5.3.2 Key View 2 – South Sierra Avenue (City of Solana Beach)

Existing View

Key View 2 is located on South Sierra Avenue, approximately 130 feet north of the Project site, and looks to the south toward the Project site (Figure 17a, Key View 2 – South Sierra Avenue [City of Solana Beach]). The Project site is located in the foreground from Key View 2, and views from this location are representative of views of the Project site available to local City of Solana Beach residents and motorists on South Sierra Drive. Additionally, the entrance to an existing bluff access trail is located immediately north of the Project site and stretches to the west along the property line, north of the chain link fence. Thus, this viewpoint is also representative of views afforded to recreationists utilizing the bluff access trail. The northern portion of the Project site and Key View 2 are located at a similar elevation (approximately 82 feet amsl); however, as discussed in the Key View 1 existing view description, the Project site gently climbs to the west and is covered by low grasses, shrubs, mature trees and patches of unvegetated land. A chain link fence separates the site from the road, creating thin and greyish horizontal and vertical lines in front of the naturally vegetated bluff top. A seemingly dense row of mature trees (including cedar and pines) spreads across the Project site from east to west and screens the southern portion of the site from view. The hazy silhouette of densely vegetated prominent terrain in the City is visible to the southeast beyond the Project site. Lastly, due to the location and orientation of Key View 2 and the presence of street trees and two-story residential development to the west of South Sierra Avenue, ocean views are not available at Key View 2. A view corridor is identified in Exhibit 4 of the Solana Beach General Plan consisting of westerly, northwesterly, and southwesterly views from near Key View 2 (City of Solana Beach 1988). It should be noted that Key View 2 is not representative of the westerly views available in the view corridor, as Key View 2 looks directly north toward the Project site.

Analysis

As depicted on Figure 17b, Key View 2 – South Sierra Avenue (City of Solana Beach), views of the primarily vacant, vegetated bluff top would be replaced with landscaping, access roads and multistory resort buildings constructed in a modern architectural style. The facades of proposed resort guest room buildings would incorporate expanses of unadorned concrete, natural wood, and glass windowpanes. The exterior materials and neutral tones of the guest room buildings would contribute a natural look to the development. As seen in the visual simulation presented on Figure 17b, a low-lying entryway monument sign would be installed at the main resort access road and would incorporate similar wood elements as the resort guest room building facade, creating a cohesive look between buildings and signage. The bluff access path would be improved as part of the Project. A short post and wire fence would replace the existing chain link fence along the access path that extends to the west along the northern site boundary. As no ocean views are

available from Key View 2, development of the site would not result in blockage of ocean views as viewed from Key View 2. However, distant views to the southeast of dark, densely vegetated hillsides in the City would be screened from view by the Project, and existing views to the naturally vegetated bluff top would be replaced by large structures, paved roads and landscaping.

As proposed and depicted on Figure 17b, the Project would introduce building scale and bulk that would contrast with the sloping, vacant and natural character of the northern portion of the Project site as viewed from Key View 2. The proposed Project's vertical bulk and scale would change the visual setting, in contrast to the gently sloping, natural bluff top. Further, proposed landscaping would noticeably shorten views across the Project site from the existing bluff access trail. Although the character of the site would substantially change, the existing visual quality of the site is moderately low. As viewed from Key View 2, the site lacks particularly memorable features and cohesive elements. For example, a dilapidated chain-link fence lines the Project site and abuts a recently mowed strip of undeveloped land bordered by a row of seemingly random tall and shorter trees (see existing conditions image on Figure 17a). In comparison to the undeveloped portions of the Project site that are visible under existing conditions from this viewpoint, implementation of the Project would introduce cohesive landscaping and modern buildings. Further, development of the modern three-story structure visible from Key View 2 would be located in close proximity to existing two- and three-story development (not visible in Key View 2). Specifically, existing two-story multifamily development buildings are located north of the site along Border Avenue and South Sierra Avenue and a three-story office building is located approximately 70 feet away at the northwestern corner of Highway 101 and Border Avenue. These existing structures display primarily stucco exteriors and wood paneled roofs, and contribute multistory building scale and multibuilding properties to the immediate area that relate to the Project and site layout. As such, the Project would change the visual character of the site, but would not substantially contrast from surrounding existing development.

5.3.3 Key View 3 – Via de la Valle at Highway 101

Existing View

Key View 3 is located at the northeastern corner of the Via de la Valle/Highway 101 intersection and looks southwest across the intersection toward the Project site. The Project site is visible in the foreground approximately 150 feet away and at an approximate elevation of 62 feet amsl. Key View 3 is representative of view accessibility and blockage provided by locales in close proximity to the Project. The recently mowed, tan-colored surface of the northern portion of the Project site is visible through an approximately 5-6 foot tall chain-link fence (see Figure 18a, Key View 3 – Via de la Valle at Highway 101). The east–west slope across the northern portion of the site is evident in the view from Key View 3, as is the wall of dense and spreading trees along the site's eastern boundary. This row of trees limits the availability of views to the Project site from locations

to the east, such as the Brigantine seafood restaurant and the handful of residences located south of Via de la Valle in the Boca Del Mar development. The existing image from Key View 3 is focused on the Project site and located in proximity such that existing structures and land uses to the north and east are not visible in the image. The southern portion of the site is hidden from view due to perimeter and interior trees. A local distribution utility line supported by wood poles is visible traversing the Project site from east to west. As at Key View 2, oceans views are not available at Key View 3.

Analysis

At Project buildout, views of the gently sloping, tan-colored surface of the northern portion of the Project site would be replaced with views of a multistory, terraced resort development. The majority of trees along the site's eastern boundary would be retained. Existing trees combined with additional landscaping would largely screen views into the eastern portion of the Project site. Portions of the top stories of resort structures toward the southeast boundary of the site would be visible from this point through and above the existing tree line bordering the eastern side of the access road. Architectural details of the proposed development, including concrete and wood facades, wooden balcony partitions, low glass balcony walls, concrete overhangs, and large glass windows are identifiable from Key View 3 (see Figure 18b, Key View 3 – Via de la Valle at Highway 101). The primary building materials (i.e., wood, concrete, glass, etc.) utilized for the proposed development are typical of materials displayed in remodeled residences, residential complexes, and commercial and hospitality structures in the Del Mar and Solana Beach communities. The Project site would be landscaped with low-lying shrubs, small and large trees surrounding the eastern and northern boundaries of the Project site. Additionally, several proposed trees, including palms and jacaranda, dot the Project site. Development of the Project site would not block any views of the ocean from this point since no ocean views are available under existing conditions.

The existing visual quality of the site is defined by a long tan strip of recently mowed land and a row of tall trees that traverse the Project site from east to west. The central, southern, and western portions of the site are obscured from view by dense clusters of mature trees. Visual quality of the site is moderately low because particularly striking visual features or patterns are lacking and existing site elements are not especially cohesive. The site has been previously disturbed and is currently covered with low grasses and exposed soils. While implementation of the Project would enhance site unity through introduction of consistent visual elements, the bulk and scale of the proposed development would dominate the scene. The Project would result in a **substantial change** from existing views of the primarily vacant site. Proposed landscaping, in addition to existing landscaping that would be retained, along the eastern and northern Project boundary would partially to fully screen some of the proposed resort structures and break up the mass of visible Project components. However, the mass of the Project would be noticeable and visible from this key view. Given the low visual quality of the site in it's current state, and the presence of

existing two- and three-story office, residential and civic development along the Highway 101 corridor that contributes long and tall building mass and scale to the visual landscape, the Project would not substantially degrade the visual character of the site and surrounding area. 5.3.4

5.3.4 Key View 4 – Via de la Valle at South Cedros Avenue

Existing View

Located on Via de la Valle, approximately 300 feet east of Key View 3 and approximately 450 feet east of the Project site, Key View 4 looks west across wide east- and westbound travel lanes and an undivided median toward the Via de la Valle/Highway 101 intersection and the northern portion of the Project site. The Project site is visible in the middle ground from Key View 4, which is representative of views afforded to motorists traveling westward on Via de la Valle. As viewed from Key View 4, the Via de la Valle corridor is flanked by tropical residential landscaping and street trees, tall streetlights, and wooden support poles (see Figure 19a, Key View 4 – Via de la Valle at South Cedros Avenue). Residential development including the boxy white exteriors of residences in the Boca Del Mar development to the southwest of Key View 4 is also located north and south of the road. With the exception of the low and tan-colored grasses and soils of the gently climbing northern portion, the Project site is largely blocked from view by a dense cluster of residential landscaping to the south of Via de la Valle.

Analysis

Due to existing landscaping installed adjacent to the eastbound travel lanes of Via de la Valle, the majority of the proposed development is blocked from view at Key View 4. However, the portion of the Project site that is visible would be completely built out and represent a visual change in comparison to existing conditions. The proposed bulk and multistory scale of the Project (located near the Via de la Valle/Highway 101 intersection) and taller resort guest room buildings to the west would be apparent. The proposed development would bear a resemblance to the boxy form of existing residential structures located in the foreground and to the south of Via de la Valle (see Figure 19b, Key View 4 – Via de la Valle at South Cedros Avenue). While the proposed development would display greater scale and mass than the existing view, the development would display a familiar form as visible residential buildings viewed from KOP 3. Further, while not visible in the particular vantage point presented in Figure 19b, two- and three-story development incorporating wood, glass, stucco, and concrete building materials are typical along the nearby Highway 101 and Via de la Valle corridors. Existing development establishes one- to three-story residential, office, commercial/.retail, hotel, and civic uses in the visual landscape and tempers the expectations of mobile receptors for pristine and undeveloped properties and unencumbered views. Therefore, implementation of the Project would result in a noticeable change, but would not result in substantial degradation of visual character as viewed from Key View 4.

5.3.5 Key View 5 – Del Mar Coastline northwest of North Beach

Existing View

Key View 5 is located west of the City's North Beach and looks toward the broad and striated western face of the bluff that underlies the Project site. The bluff is located in the foreground from Key View 5, which is located approximately 120 feet from the prominent bluff terrain, and is representative of views to the Project site available to beachgoers and others engaged in water-based activities to the immediate west. As shown on Figure 20a, Key View 5 – Del Mar Coastline northwest of North Beach, views to the bluff top are limited to the westernmost edge of the site that currently supports a low, wood-post and chain fence and chain-link fencing. Instead, viewers are provided views of a sandy beach that transitions to clusters of rocky outcrops and the sheer, striated, and granular western face of the ocean bluff. With the exception of bluff top fencing and signage, no development is visible from Key View 5.

Analysis

The proposed development would be setback from the edge of the coastal bluff**,** and as a result, Project components would not visible from Key View 5. As seen on Figure 20b, Key View 5 – Del Mar Coastline northwest of North Beach, existing and proposed views from this point are identical. With consideration that the visual character of the Project site would not change as viewed from Key View 5, there would be no substantial degradation to existing views. Although some elements would be visible to boaters and other ocean recreationists located at greater distance from the coastline, there would be a substantial variation in elevation between the viewer on the ocean and the development atop the bluff. Additionally, view focus could be expected to be oriented toward the open water views and coastline, rather than the elevated bluff-top. As such, the Project would result in no contrast or change as compared to the existing visual character or quality of the Project site and surrounding area as viewed from Key View 5 would occur.

5.3.6 Key View 6 – Camino Del Mar (North of Lagoon Bridge)

Existing View

Located to the east on Camino Del Mar, Key View 6 is situated approximately 230 feet from the eastern boundary of the Project site. At Key View 6, the Project site is visible in the foreground, and viewers are situated at an approximate elevation of 16 feet amsl, approximately 60 feet amsl lower than the bluff top of the Project site. Key View 6 is representative of views of the Project site afforded to motorists, cyclists and pedestrians traveling on Highway 101. Public beach parking and coastal access is available near Key View 6, and therefore, beachgoers would be afforded similar views of the Project site when arriving or departing the beach. As shown on Figure 21a, Key View 6 – Camino Del Mar (North of Lagoon Bridge), the Project site is

characterized by a broad and relatively steep east-facing slope covered with low, grey-to-green mounded vegetation separated by expanses of unvegetated sandy soil. The faint horizontal line of a black chain-link fence is visible along the Project site's eastern extent and moderate-to-tall, dark green, and spreading trees rise from the flat bluff top. The reddish tan color and angular lines of a gate and residential structure are barely visible on the Project site from Key View 6. Small, rectangular white signs are installed along the fence and interrupt the otherwise cluster of green on the bluff top. Low, greyish green vegetation and scant trees are installed in the Camino Del Mar median and cars parked along the southbound travel lane of the road also occupy the scene at Key View 6.

Analysis

Implementation of the Project would alter the existing visual character of the Project site as viewed from Key View 6. Architectural elements of proposed three-story resort villa buildings located along the eastern Project boundary, including light brown wood facades, glass windows, and flat and thin concrete balconies and building, would be evident from Key View 6 (see Figure 21b, Key View 6 – Camino Del Mar [North of Lagoon Bridge]). In comparison to the scattered and varying tree and shrub species that characterize the existing bluff top, Project development would create a consistent silhouette of angular lines displayed by concrete balconies and building overhangs. In addition to proposed resort buildings atop the bluff, the proposed restroom facility, roof observation deck, and stair system that would provide access to the James G. Scripps Bluff Preserve would be visible from Key View 6. As proposed, the rectangular, single-story restroom facility may incorporate a variety of suitable materials that would be identified in the Specific Plan. For purposes of this analysis, a split-face concrete block structure covered with a concrete and wood slat observation deck was assumed. The stair system was assumed to be constructed of concrete support pylons and wooden decks, stairs, and railing.

The proposed restroom facility would create a boxy yet low profile form that would block a small portion of the base of the bluff from view. However, the restroom facility would negate the need for temporary restroom facilities ("port-o-potty") to be deployed along Camino Del Mar and would avoid the color contrast associated with the presence of bright blue structures at the base of the bluff (see Figure 21a). A system of concrete stairs would climb the east-facing slope of the bluff and would create hard, lightly colored angular lines (see Figure 21b) that would contrast with the scattered shrub and grass covered slope terrain.

Incorporation of natural wood and earth-toned materials and colors in the exterior of proposed Project structures would create a visual connection between the resort and existing tan-colored soils of the bluff top and would reduce overall contrast. While the restroom facility and stair system would be a noticeable new feature in the visual landscape at Key View 6, Project components would not produce overly strong contrast and the stairs would create relatively thin lines against the greys and tans displayed by nearby soils and soils. As such, the addition of these Project

components would not dominate the scene. In addition, a significant portion of the east-facing slope would remain unaltered and the restroom facility and stair system would improve public services and enhance bluff top access. As viewed from Key View 6, both the proposed Project would represent visual change along the Camino Del Mar visual corridor however, existing characteristics of the slope and bluff top would remain prominent in the view. Therefore, the Project would not substantially degrade the visual quality or character of the site and surrounding areas as viewed from Key View 6.

5.3.7 Key View 7 – Camino Del Mar (South of Lagoon Bridge)

Existing View

Key View 7 is located on Camino Del Mar, just south of the lagoon crossing, approximately 0.25 miles southeast of the Project site. The Project is visible in the middle ground from Key View 7. Situated at an approximate elevation of 14 feet amsl, Key View 7 looks to the north-northwest along the divided travel lanes of Camino Del Mar toward the flat bluff top of the Project site, which is situated at approximately 85 feet amsl. Key View 7 is representative of views available to motorists and cyclists traveling northbound on Camino Del Mar, private residences located immediately west of Key View 7 in the City of Del Mar, beachgoers and recreationist on the San Dieguito Lagoon trail. The low horizontal and vertical lines created by the road, bridge fencing and railing (see Figure 22a, Key View 7 – Camino Del Mar [South of Lagoon Bridge]) draw the viewer's attention along the Camino Del Mar corridor to a focal point to the north comprised of the coastal bluff underlying the Project site. Visual focus tends to be directed toward the activity of cars and cyclists on Camino Del Mar, but then transitions to the tan-to-brown colored slopes, trapezoidal form, and dense, dark green vegetation of the prominent bluff. Although partially obscured, ocean views are available to the northwest, and the lifeguard tower and the sandy surface of North Beach are also visible. As viewers travel north on Camino Del Mar, ocean views to the west become wider and more prominent as the road spans the lagoon. Estuarine habitat consisting of wetlands, sandy shores and low grasses and shrubs is visible east of the road. From Key View 7, Camino Del Mar appears busy with activity; however visible development is largely screened by vegetation and limited to the grayish exterior and white angular lines of the Brigantine seafood restaurant and boxy, lightly colored exterior of partially obscured structures to the north and northeast. Fencing and a gate installed on the bluff top are difficult to detect from Key View 7, and the existing residential structure located on site is blocked from view by dense clusters of mature trees and vegetation on the Project site.

Analysis

Implementation of the Project would alter the existing view from Key View 7, a visual simulation of the Project is provided in Figure 22b, Key View 7 – Camino Del Mar (South of Lagoon Bridge).

Once constructed, the proposed development would be visible atop the bluff from this location. The introduction of the proposed resort development would result in a noticeable visual change along the eastern property boundary due the lack of any visible development currently atop the bluff as viewed from Key View 7. As proposed, the south-elevation of three-story resort villas along the eastern portion of the Project site would be partially screened by existing and proposed landscaping. However, the warm colors of natural wood elements, large windows and flat, angular rooflines and balconies on the structures would contrast from the round, dark green treetops under existing conditions. In addition to these structures, landscaping and structures displaying a natural wood element exterior in the southwestern corner of the Project site would be visible. These structures would display a low vertical profile and due to the warm color of exterior finishes, would tend to blend into surrounding landscaping and flat terrain in the westernmost portion of the bluff top.

In addition to the bluff top resort development, the proposed stairs that would provide beach access for the Project as well as new pedestrian access to the James G. Scripps Bluff Preserve, would add sharp angular lines and shadows to the east- facing slope of the bluff. The proposed restroom facility and roof observation deck would display tan and grayish tones and boxy shapes at the base of the east-facing slope. The light grey concrete supporting pillars and natural wood stairs and railing would zigzag from the roof of the restroom facility to the top of the bluff. Apart from the proposed restroom facility, roof observation deck and stair system the majority of the south- and east- facing slopes would remain unaltered and would retain its dense to dotted shrub and grass covered appearance and natural character.

While development would be visible, the majority of the Project would be obscured from view by existing and proposed landscaping and by intervening development on the Project site (i.e., the visible three-story villas). Visible development on the easterly portion of the Project site would be located in relatively close proximity to existing development in the view along the Camino Del Mar and Via de la Valle corridors that tend to display similar architectural elements (i.e., warm tones on building exteriors, flat rooflines, wood and glass building materials) as the Project. The bluff serves as a prominent focal point in the view, and the Project would change the visual character of the landform, but it would not result in substantial degradation.

5.3.8 Key View 8 – Del Mar Coastline south of North Beach

Existing View

Located south of North Beach and the mouth of the San Dieguito River, Key View 8 is situated on the Del Mar coastline approximately 0.30 miles from the Project site. The Project site is visible in the middle ground from Key View 8, and is representative of views to the Project site available to beachgoers (local beach access is provided to the public off Camino Del Mar at 29th Street) and nearby beach residents located west of Camino Del Mar. As shown on Figure 23a, Key View 8 –

Del Mar Coastline South of North Beach, the view looks north across the coastal waters and the sandy coastline of North Beach to the prominent southern and western bluff faces and bluff top underlying the Project site. The horizontal and vertical lines and light exterior colors of single-family beachfront residences to the immediate east of Key View 8 are visible. The shoreline and sandy beach is visible directly in the view and the Pacific Ocean is visible to the north and west. The lightly colored North Beach lifeguard tower is visible on the sand against a backdrop of the southeastern bluff face. The south- and southeast-facing slopes of the bluff are covered with primarily dry grasses and vegetation ranging from light to dark brown and dark green. An existing bluff access trail forms a faint, diagonal line across the southeastern bluff face that climbs the slope from west to east. The west-facing slope has exposed tan and gold sandy soils with horizontal striated lines and jagged crevices that cast dark shadows on the lower half of the bluff face, and slanted vertical lines from the top of the bluff with occasional patches of brown, dry vegetation on the upper half of the bluff face. North Beach appears to be characteristically busy with the activity of beachgoers. The existing structure located atop the bluff is not visible from Key View 8; instead, dense clusters of dark green, tall trees form soft, rounded lines atop the bluff.

Analysis

A visual simulation of the Project as viewed from Key View 8 is provided on Figure 23b, Key View 8 – Del Mar Coastline South of North Beach. The top one to two stories of proposed three-story resort buildings would be partially visible from Key View 8, resulting in visual change atop the bluff. The natural wood elements in building exteriors, and flat, horizontal rooflines of three-story villas on the eastern portion of the Project site would be visible above the round, soft lines displayed by existing bluff top vegetation and landscaping. However, Project buildings would not dominate the view. Rather, the natural dark brown and grey colors displayed by exterior finishes in the south elevations of buildings depicted in Figure 23b would help the proposed development blend into the existing setting created by the dark greens displayed by existing landscaping. As a result, scale and color contrasts would be weak. Further, the subtle diagonal line created by the existing road/access trail would be removed and replaced with appropriate native shrubs (revegetation of the road is not depicted in Figure 23b). The proposed stairs would create a thin zigzag line on the east-facing slope of the bluff that would be noticeable but would not be visually prominent in the view. Vertical, concrete support pillars would be the most noticeable feature of the stair system, as the natural wood color of the stairs and railing would blend into the surrounding bluff landscape. As viewed from Key View 8, the introduction of the Project would not substantially degrade the existing character or quality of the site and surrounding area and views would not be substantially altered.

5.3.9 Key View 9 – Jimmy Durante Boulevard at San Dieguito River Bridge

Existing View

Key View 9 is located on Jimmy Durante Boulevard at the San Dieguito River crossing. As opposed to a view from the road in which the concrete walls and parallel metal railing of the bridge walls would be visible, Key View 9 approximates westerly views from the bridge available to pedestrians and hikers/walkers along the nearby San Dieguito River trail (see Figure 24a, Key View 9 – Jimmy Durante Boulevard at San Dieguito River Bridge). Located 0.65 miles away, the Project site is visible in the middle ground of Key View 9, which looks to the northwest across the San Dieguito River, beyond the Del Mar Fairgrounds to the brownish stippled, east-facing slope and flat bluff top of the Project site. From Key View 9, foreground views are dominated by the bluish waters and vegetated banks of the San Dieguito River, long, tan buildings topped with pitched, red, metallic roofs of the Del Mar Fairgrounds structures located north of the river and the taller, tan, and red-roof Del Mar Fairgrounds grandstand building to the north. The northern extent of a bridge that supports the railroad tracks is visible as it spans the river. The numerous dark support beams and flat, horizontal deck of the bridge create dark horizontal and vertical lines in the view. In the middle ground, mottled brown vegetation is visible on the east facing slopes of the bluff and dense clusters of trees are visible atop the bluff. The lightly colored roof and rectangular form of the existing structure located on the Project site is visible, but additional details are indistinct from Key View 9 due to the distance. With the exception of this element of development, dense and dark green trees characterize the Project site bluff top.

Analysis

A visual simulation of the Project at viewed from Key View 9 is provided on Figure 24b, Key View 9 – Jimmy Durante Boulevard at San Dieguito River Bridge. Due to the distance of the Project site from Key View 9 and the greater elevation of the Project site compared to the key view, indistinct and partially screened views of Project components atop the bluff would be available. As shown on Figure 24b, rooflines of proposed resort development would create a barely visible, stepped horizontal line atop the bluff that would replace the irregular, curved line displayed by the crowns of existing trees. Visible flat rooflines would generally replicate the horizontal lines displayed by foreground buildings and the warm colors of architectural finishes of the proposed development would help the Project blend in with the existing bluff terrain and vegetation (see Figure 24b). Further, the inclusion of two- to six-story buildings within the Del Mar Fairgrounds contributes multistory building mass and scale to the view. In addition to distance between Key View 9 and the Project site that reduces the apparent scale of Project buildings, these existing features establish a developed character in the view that reduce effects to the visual setting resulting from the introduction of the Project. Implementation of the Project would not result in substantial changes to the existing view in comparison to existing conditions.

5.3.10 Key View 10 – Balboa Avenue (City of Del Mar)

Existing View

Key View 10 is situated on Balboa Avenue, approximately 0.80 miles to the southeast of the Project site in a hilly, residential neighborhood of the City. From the elevated vantage point available at Key View 10, the existing view is an expansive, panoramic view of the Pacific Ocean and coastline. The Project site is visible in the background from Key View 10. The view encompasses residential development in the foreground, undeveloped terrain located south of the San Dieguito River and east of the railroad line, single-family and multifamily development and residential landscaping located west of the railroad line. In addition, the western extent of the Del Mar Fairgrounds, North Beach, and the bluff top Project site are visible from Key View 10 (Figure 25a, Key View 10 – Balboa Avenue [City of Del Mar]). Existing structures located on the southern parcel of the Project site are visible as slivers of light colors and angular lines from Key View 10. The density of landscaping on the Project site obscures existing structures such that available views are broken and structures are not visually prominent. Visible development tends to display boxy and rectangular forms and grayish tones as viewed from Key View 10 and lots routinely incorporate moderate to dense site landscaping that effectively obscures elements of development from view. Panoramic ocean views are prominent from Key View 10.

Analysis

A visual simulation of the Project as viewed from Key View 10 is provided on Figure 25b, Key View 10 – Balboa Avenue (City of Del Mar). Implementation of the Project would alter the existing visual character of the Project site from Key View 10. Although distant and indistinct, the majority of the structures associated with the proposed resort would be visible. Existing and proposed trees and shrubs that currently run along the southern boundary of the Project site would shield the ground-level elements of the Project from view; however, the mounded forms and lines and dark green color displayed by existing dense vegetation on site would be replaced by rectangular and lightly colored multilevel resort buildings (Figure 25b). Additionally, the proposed stair system on the southeast face of the bluff would be visible as it zigzags down the bluff face. However, the natural wood and warm color of the stair system would blend into the existing topography and vegetation and is not visually prominent. Both the restroom facility and stairs would be visible but faint.

Ocean views directly beyond the Project site from Key View 10 are not visually prominent in comparison to the uninterrupted ocean views available to the south of the site. Further, in some areas beyond the Project site, ocean views are generally not available due to the elevated form of the bluff and the presence of dense, mature vegetation atop the bluff. With implementation of the proposed development, vegetation would be removed from the site to accommodate resort buildings and grounds. The introduction of a

multistory resort development on the primarily vacant site would alter existing views from this point; however, available ocean views would be minimally altered when compared to existing conditions. Furthermore, the quality and extent of existing unimpeded and uninterrupted ocean views available at Key View 10 to the west would not be altered by proposed development.

The flat bluff top would continue to display a primarily flat, horizontal form. As shown on Figure 25b, proposed development would contribute warm tan/brown tones and long rectangular forms to the bluff top. However, the buildings would display flat rooflines and as viewed from approximately 0.80 miles away, the Project would appear to exhibit comparable site coverage to that of existing development located west of the AMTRAK and NCTD Coaster rail corridor (see Figure 25b). In addition, existing development present in the view displays a varied architectural character and Project architecture would contribute to the existing visual variety displayed by visible commercial and residential development. While the proposed development would be evident from this view and would alter the existing character of the bluff top, the visual change depicted in Figure 25b would be experienced by a relatively limited of private residents and motorists, and the anticipated change would not constitute substantial degradation of the site and surrounding area.

5.3.11 Key View 11 – Camino Del Mar at Jimmy Durante Boulevard

Existing View

Key View 11 is located on northbound Camino Del Mar, near the Jimmy Durante Boulevard split and Luzon Avenue. Situated approximately 0.90 miles south of the Project site, Key View 11 looks to the north along the northbound travel lane of Camino Del Mar to the partially screened Project site bluff top visible in the background. The view from Key View 11 includes hilly terrain developed with seemingly continuous rows of whitish and tan-colored residences in the City of Solana Beach (Figure 26a, Key View 11 – Camino Del Mar at Jimmy Durante Boulevard). From Key View 11, dense plantings are installed along the Camino Del Mar corridor and foreground vegetation to the north partially blocks the south-facing slope of the Project site from view. Further, at a distance of approximately 0.90 miles, architectural details of the existing structure located on the Project site are indistinct, and clear views to these elements are interrupted and partially concealed by existing site landscaping. The hilly and prominent terrain to the north in the City of Solana Beach is densely developed by residential structures, and the whitish to tan tones of building exteriors marked the distant terrain. While discontinuous due to the presence of mature, spreading vegetation along the Camino Del Mar corridor, ocean views are available to the northwest from Key View 11.

Analysis

A visual simulation of the Project as viewed from Key View 11 is provided on Figure 26b, Key View 11 – Camino Del Mar at Jimmy Durante Boulevard. As viewed from Key View 11, the resort

development would display a low vertical profile and flat rooflines. These elements would be generally located central to the view and just above mature landscaping installed immediately adjacent to the bridge in the foreground. Due to the low profile and flat rooflines, proposed development atop the bluff would not be visually prominent in the landscape. The density of visible vegetation on site would be reduced to accommodate the Project; however, existing vegetation would be retained along the eastern and southern property boundary. As a result, the site would retain a semblance of its existing characteristics. In addition, the distance between Key View 11 and the Project site (approximately 0.90 miles) reduces the visual prominence of proposed resort buildings as experienced by local motorists on northbound Camino Del Mar at the Jimmy Durante Boulevard split. Further, Camino Del Mar and Jimmy Durante Boulevard are the dominant elements in the landscape and motorists are not provided continuous and long-duration opportunities for views away from the road and towards the Project site. Rather, glimpses to the Project site are available and motorists must pay attention to the immediate foreground (i.e., the road) to safely navigate the Camino Del Mar and Jimmy Durante Boulevard split and watch for other vehicles, cyclists and pedestrians. Further, the background bluff top (located 0.90 miles away) is noticeable over an approximate 370-foot long segment of the road. Along this stretch, views are available for approximately 8 seconds assuming a travel speed of 30 mph. Beyond this segment, the Project site is abruptly obscured from view as the elevation of the road descends and homes and trees shorten the length of the available northward views. Because the Project would not result in a substantial visual change from this point in comparison to existing conditions and the proposed resort buildings would not be visually prominent in the fleeting views to the Project site, the Project would not substantially degrade the existing character or quality of the site and surrounding area.

5.3.12 Key View 12 – Del Mar Plaza Roof Deck

Existing View

Key View 12 is located atop the rooftop dining and seating area within Del Mar Plaza, a shopping mall in the City, approximately 1.2 miles from the Project site, and looks to the north along Camino Del Mar and into the City of Solana Beach. The Project site is visible in the background from Key View 12. At Key View 12, restaurant furniture atop the rooftop deck, travel lanes, and median and streetscape plantings occupy immediate foreground views. Streetscape plantings, including the installation of tall and spreading pine trees and dense ficus trees (*Ficus* sp.), effectively conceal residential and resort development located to the northwest of Del Mar Plaza from view at Key View 12 (Figure 27a, Key View 12 – Del Mar Plaza Roof Deck). The tan and gold colors of the south-facing slope of the Project site are visible from Key View 12, and faint, light colored lines displayed by the existing structures located on site are detectable. However, development on the Project site is indistinct and not visually prominent. Ocean views are available at Key View 12, and viewers are attracted to long and broad views of the ocean available from the elevated vantage point of the Del Mar Plaza.

Analysis

A visual simulation of the Project at viewed from Key View 12 is provided on Figure 27b, Key View 12 – Del Mar Plaza Roof Deck. With implementation of the Project, views of the Project site from Key View 12 would be altered. However, due to distance between Key View 12 and the Project site, proposed resort development would be indistinct and would not be visually prominent (Figure 27b). While the scale and materiality of resort villas proposed near the southern property boundary would be visible from the Del Mar Plaza, the bulk of the proposed resort development would not be evident due to partial screening of the site associated with dense ficus trees installed in the foreground along Camino Del Mar. In addition, the Project would blend with the existing topography and landscape of the Project site due to distance and would not result in a substantial visual change as viewed from Key View 12.

5.3.13 Key View 13 – James Scripps Bluff Preserve Trail

Existing View

Key View 13 is located approximately 190 feet south of the Project site within the James Scripps Bluff Preserve area, atop the same bluff as the Project site. This area is comprised of the southern extent of the bluff-top with low-lying coastal shrub habitat and a small trail system where visitors are afforded panoramic views of the Pacific Ocean to the west. Key View 13 looks north toward the Project site along a bluff-top trail (see Figure 28a, Key View 13 – James Scripps Bluff Preserve Trail), and is representative of views of the Project site afforded to recreationists visiting the James Scripps Bluff Preserve. The Project site is visible in the foreground, beyond two parallel sandy, dirt trails, a vista point and surrounding low lying coastal shrub habitat. A low wood-post and chain fence is installed along the westernmost edge of the bluff, and a meandering, black chain-link fence chain continues along the bluff edge as it forms the western boundary of the existing on-site residential property. Chain-link fencing with barbed wire and periodic small, white rectangular signage separate the southern edge of the residential property from the James Scripps Bluff Preserve area, and delineates the northern Project site boundary. Existing vegetation and landscaping within the residential property is prominently visible. Vegetation consisting of dense clusters of various shrubs, and tall and mature pine (*Pinus* sp.), cypress (*Cupressus* sp.), and ficus trees (*Ficus* sp.) effectively conceal the existing residence, apart from small portions of the sandy-beige colored roof tiles and stone chimney. The Pacific Ocean and western face of the bluff are visible to the northwest. Viewer's attention is drawn to the expansive, panoramic views of the Pacific Ocean to the west.

Analysis

A visual simulation of the Project at viewed from Key View 13 is provided on Figure 28b, Key View 13 – James Scripps Bluff Preserve Trail. With implementation of the Project, views of the Project site from Key View 13 would be altered. The introduction of the Project would result in a

noticeable visual change along the southern property boundary. Existing views of dense vegetation and trees would be replaced with views of one- to three-story resort development with flat, angular rooflines. As proposed, the south-elevation of three-story resort villas would be partially screened by existing and proposed landscaping. However, the warm colors of natural wood elements, large windows and flat, angular rooflines and balconies on the structures would contrast from the light to dark shades of green presented by existing vegetation. While the bulk, scale and materiality of structures proposed near the southern property boundary would be visible from Key View 13, these structures would display a low vertical profile with flat rooflines. Also, the Project would use warm colors for exterior finishes and screening landscape.

Additionally, it should be noted that views of the ocean and western face of the bluff landform would remain unchanged. Further, notable views from this location not exemplified in Figure 28a include panoramic views of the Pacific Ocean to the west, coastline views to the north and south, river and estuarine habitat to the southeast, and distant hilly terrain to the east.

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6 VISUAL IMPACT ASSESSMENT

The following significance criteria are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), and are used throughout this report to determine the significance of potential aesthetic impacts associated with construction and operation of the Project. Impacts to aesthetics and visual resources would be significant if the proposed Project would:

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. Substantially degrade the existing visual character or quality of public views of the site and its surroundings.

D. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Threshold A: Would the Project have a substantial adverse effect on a scenic vista?

An important consideration of coastal development proposals in the City of Del Mar is the preservation of scenic views. The preservation of scenic views is established within the City's Municipal Code (see Section 2.2.3) and the City has a process for the restoration and preservation of private scenic views. Further, scenic views within the City of Del Mar include "views of the ocean, lagoons, canyons, the community and its landscapes and urban forest character" (City of Del Mar 2019). As demonstrated in Section 5 above, views of the ocean are available from public roads adjacent to the Project site and from public roads located atop elevated topography to the north and south in the Cities of Solana Beach and Del Mar. To assist in view preservation efforts the City has enacted height restrictions and a comprehensive design review process. For purposes of this assessment, 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 or where a distinct landscape (or landform) is evident and implementation of a project would result in strong visual contrast in existing views.

As detailed in the Specific Plan (Dudek 2019), the Project would be oriented and spaced such that the proposed buildings and open space areas would maintain important vistas to the west, south, and east. For example, the proposed building orientation design has a transect that clusters the majority of development at its center (see Figure 2b) and a reduced scale of building along the perimeter, providing a transitional edge treatment for the areas visible from public spaces, such as nearby roadways and the beach. As proposed, the Project would feature a combination of one- to three-story structures, with the highest structures clustered in the central portion of the Project site. In accordance with the Specific Plan and City regulations for bluff development, structures would be required to be set back from the top of the bluff a minimum of 40 feet, further

condensing structures toward the central, eastern and northern portions of the site. The heights of the proposed structures would be similar to the canopies of existing mature trees on site in order to minimally disrupt available coastal views from the surrounding area.

As described in Section 5.1 above, thirteen key views were identified and assessed to determine the anticipated visual contrast that would occur with implementation of the Project. While the key views are representative of views to the Project site available from roads, residences, and recreational areas in the proposed Project area, ten of the key views have been selected to assess potential Project impacts to scenic vistas and views. The selected key views (Key Views 1, 5, 6, 7, 8, 9, 10, 11 and 13) include public vantage points in the Cities of Solana Beach and Del Mar at which "blue water" views and the Project site are experienced alongside one another. In addition, the selected key views include public vantage points at which the prominent, elevated form of the bluff comprising the Project site is distinct such that it may be considered by viewers a valued component of the City's landscape. Key Views that were not selected for the following scenic vista analysis (Key Views 2, 3, 4) were excluded due to their lack of "blue water" views to the ocean or the prominent bluff landform. As such, these Key Views are not representative of scenic views. While key views did not specifically include residential views from private property, several of the key views (i.e., Key Views 1, 7, 8, 10 and 12) are located on public roads within/near residential neighborhoods and due to proximity, are representative of permanent private views available to residents. The potential adverse effects to scenic views resulting from the Project are addressed more specifically below for each identified key view.

Key View 1: West Solana Circle View (City of Solana Beach)

While located on West Solana Circle and representative of existing public views to the Project site provided to motorists, Key View 1 is also representative of existing private views to the Project site provided to nearby Solana Beach residences. Further, westerly views from this location are identified as a view corridor in Exhibit 4 of the Solana Beach General Plan (City of Solana Beach 1988). The Project site is visible in the middle ground approximately 0.25 miles from Key View 1.

At Key View 1, "blue water" ocean views are currently available to local motorists and residents on West Solana Circle and the elevated bluff underlying the Project site is evident due to the proximity of lower elevation land (e.g., North Beach) to the south (see Figure 16a). From Key View 1, the Project site appears as an elevated coastal bluff with steep and vegetated southeasterly facing slopes and dense to, at times, clumped landscaping (primarily mature trees) on the southern portion in the middle ground of the view. As illustrated in the visual simulation of the Project prepared from Key View 1, the introduction of a one- to three-story resort development on the primarily vacant Project site would alter the existing ocean view. The Project would result in a change in the site's natural appearance, vegetation and trees, which contribute to the community's landscapes and urban forest character. However, as described in Section 5.3.1, although the Project would result in a contrast from the existing visual character of the site, it would not substantially degrade the existing views to the ocean.

Key View 5 and 8: Del Mar Coastline Views

Key Views 5 and 8 are both located on the beach and are representative of existing public views to the Project site provided to nearby beachgoers and water-based recreationists in the Pacific Ocean. The Project site is visible in the foreground approximately 120 feet from Key View 5 and middle ground approximately 0.3 miles from Key View 8.

At Key Views 5 and 8 the prominent form and distinct topography of the bluff are evident to viewers. While Project development would not be visible from Key View 5 (see Figure 20b; proposed buildings, landscaping, and amenities would be setback from the edge of the coastal bluff and obscured in the foreground view), these elements would be visible to boaters and other ocean recreationists located a greater distance from the coastline. However, as demonstrated in Key View 8 (see Figure 23b), at vantage points more distant than Key View 5, proposed development would occupy less of the visible landscape and would be viewed in the context of existing residential development. As such, implementation of the Project would not result in strong visual contrast or obscure scenic views as seen from Key Views 5 and 8.

Key Views 6 and 7: Camino Del Mar Views

Key Views 6 and 7 are both located on Camino Del Mar and are representative of foreground (Key View 6) and middle ground (Key View 7) views to the Project site afforded to motorists on public roads, private residences located immediately west of Key View 7 in the City of Del Mar, beachgoers and recreationist on the San Dieguito Lagoon trail. In addition, Camino Del Mar is designated as a scenic corridor by the City of Del Mar and the Community Plan specifically identifies ocean and lagoon views as scenic views available from the road (City of Del Mar 1976). The Project site is visible in the foreground approximately 230 feet from Key View 6 and middle ground approximately 0.25 miles from Key View 7.

While implementation of the Project would noticeably alter the existing character of the bluff top and east-facing slope as viewed from Key Views 6 and 7 (see Figures 21b and 22b), existing coastal and lagoon views from Camino Del Mar would not be obstructed or otherwise affected. Therefore, the Project would have no impact on existing scenic views (blue water" coastal and lagoon views) from Camino Del Mar that are specifically identified in and protected by the Community Plan; see also Section 5.3.6 and 5.3.7.

Key View 9: Jimmy Durante Boulevard at San Dieguito River Bridge

Key View 9 is located on Jimmy Durante Boulevard on a bridge that spans the San Dieguito River. Key View 9 is representative of westerly views from the bridge available to pedestrians and hikers/walkers along the nearby San Dieguito River trail (motorists' views from the bridge would

include intervening concrete walls and parallel metal railing of the bridge walls). The Project site is visible in the middle ground approximately 0.65 miles from Key View 9.

At Key View 9, "blue water" views of the San Dieguito River are prominent in the foreground, and views to the Project site are available in the distance beyond long white and red buildings within the Del Mar Fairgrounds and the railroad tracks. The prominent bluff top rises above the intervening development, and the mottled brown and tan appearance of the eastern bluff face is visible. The stepped, horizontal roofline of the Project would replace the crowns of existing dark green trees on site, however, the change in the scene would not attract attention. In addition, the distance between Key View 9 and the Project site would reduce the apparent scale of Project buildings, which would mimic the flat bluff top. Views of the San Dieguito River, which dominate the view, would remain unchanged.

Key View 10: Balboa Avenue Views (City of Del Mar) and Key View 12: Del Mar Plaza Views

Key Views 10 and 12 are both located in more distant, higher elevation vantage points within the City of Del Mar and are representative of both public and private views to the Project site and the coast and ocean. Viewers from these locations include motorists, patrons of the Del Mar Plaza mall and eateries, and private residences. The Project site is visible in the background approximately 0.8 miles and 1.2 miles from Key Views 10 and 12, respectively.

At Key Views 10 and 12, proposed resort development atop the bluff would be noticeable in the background in views from private and public vantage points. However, from relatively distant vantage points, Project development would be visible but would not dominate the scene, and the scale and mass of the Project would display similarities with the scale and mass of existing development in the surrounding area (see Figures 25b and 27b). Also, as viewed from these vantage points, one- to three-story structures on the Project site would not substantially alter coastal views (existing ocean views would primarily be maintained) and would not interrupt the scenic features of the view. Further, the prominent bluff landform would remain visible, and Project development would not attract visual focus because "blue water" ocean and lagoon views would dominate the scene.

Key View 11: Camino Del Mar at Jimmy Durante Boulevard

Key View 11 is located on northbound Camino Del Mar, near the Jimmy Durante Boulevard split and Luzon Avenue, and is representative of views of the Project site afforded to motorists. The Project site is visible in the background approximately 0.9 miles away from Key View 11.

At Key View 11, motorists are provided intermittent "blue water" ocean views and views to the bluff underlying the Project site. Views are interrupted or partially screened by intervening vegetation and infrastructure as motorists travel along the roadway. The Project would display a low vertical profile and flat rooflines atop the flat bluff (see Figure 26b). While the density of visible vegetation on site would be reduced, the replacement of existing on-site trees with resort

development would be barely noticeable from Key View 11. Further, the Project would not result in increased blockage of "blue water" ocean or coastal views. The Project would not result in substantial visual changes from Key View 11.

Key View 13: James Scripps Bluff Preserve

Key View 13 is located approximately within the James Scripps Bluff Preserve area, atop the same bluff as the Project site, and is representative of views of the Project site afforded to recreationists visiting the James Scripps Bluff Preserve. The Project site is visible in the foreground approximately 190 feet away from Key View 13.

At Key View 13, recreationists are afforded immediate foreground views of the Project site and the southern extent of the bluff-top with low-lying coastal shrub habitat and two parallel trails. The western bluff face and "blue water" ocean views are available to the northwest from Key View 13. The small trail system within the James Scripps Bluff Preserve provides visitors with panoramic views of the Pacific Ocean to the west. The introduction of the proposed resort development would result in a noticeable visual change along the southern property boundary. Existing views of dense, green vegetation and trees would be replaced with tan colored building facades, large windows and flat, angular rooflines. While Project development would be visible from Key View 13, Project structures and amenities would not substantially affect the long and broad westerly views of the ocean, coastline views to the north and south, river and estuarine habitat to the southeast, and distant hilly terrain to the east.

Summary

As previously discussed, Project development would be visible in the key viewpoints analyzed for purposes of this threshold. Project elements (buildings, landscaping, and bluff access improvements) would be noticeable but would not be visually prominent or substantially detract from existing scenic views. As proposed, Project buildings would be sited so that the low intensity structures are located closest to the bluff to provide edge treatment and preserve views and open space. Taller buildings would be constructed along the more south, central and eastern portions of the Project site in an effort to reduce impacts on existing coastal views. As specified in the Specific Plan, buildings would be designed to follow the natural topography and display flat rooflines in order to preserve existing views to the extent practicable and minimize the appearance of bulk and massing. In summary, the Project not have a substantial effect on scenic vistas and impacts would **be less than significant.**

Threshold B: Would the Project substantially damage scenic resources including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?

There are no officially designated state scenic highways within close proximity to the City of Del Mar, nor any within the northwestern San Diego County region (Caltrans 2018). The nearest facility included in the State Scenic Highway Program, I-5, is located approximately 1.2 miles east of the Project site. From roughly Coronado north to SR-74 near San Juan Capistrano, I-5 is an Eligible State Scenic Highway under Caltrans' Scenic Highway Mapping System (Caltrans 2018).

Within this portion of Eligible State Scenic Highway, the Project site is temporarily visible to northbound I-5 motorists as the interstate passes Del Mar Heights Road and makes a noticeable descent as it approaches the San Dieguito Lagoon State Marine Conservation Area. Along this approximately 1.2-mile stretch of the interstate, the prominent bluff outcropping that underlies the Project site is visible in the distance in northwesterly views to the coast. As the Interstate spans the San Dieguito Lagoon State Marine Conservation Area motorists are provided views of estuarine habitat to the east and west. Westerly views also include densely vegetated hillsides with scattered development, coastal development within the City of Del Mar, the Del Mar Fairgrounds and the Pacific Ocean; easterly views also include densely vegetated hillsides with scattered development, the San Dieguito River valley framed by distant hills.

The westerly and northwesterly views to the coast and Project Site are available to motorists for approximately 66 seconds before being abruptly obscured by tall buildings at the Del Mar Fairgrounds. As such, motorists would be traveling through the scenic landscape as the I-5 spans the San Dieguito Lagoon State Marine Conservation Area for over 1 minute. However, the distance between I-5 and the Project site would reduce the apparent scale and mass of proposed development, and the Project would be relatively indistinct in views from northbound I-5. Further, due to the variety of visual elements in the scene it is anticipated that motorists would be primarily focused on the road and the foreground views of estuarine habitat rather than distant views to the coastal bluff located over one mile away.

The Project site is generally located outside the normal field of vision of southbound I-5 motorists in this area. As such, existing views available to motorists from southbound I-5 would not be noticeably altered by development of the Project. Lastly, proposed development would not entail removal or damage to historic buildings or trees within a state scenic highway. There are no historic buildings on site and trees proposed for removal as part of the Project would be appropriately mitigated. Specifically, there are 42 protected trees proposed for removal that require mitigation as part of the Project and 49 protected trees that would be retained on site. The 42 protected trees proposed for removal would be replaced with 77 new protected specimen trees. It should also be noted that trees within the Project site are not particularly discernible from I-5. No impact to an officially designated scenic highway would occur and the introduction of proposed

development on the Project site would result in minor visual change as experienced from I-5, an Eligible State Scenic Highway. Therefore, as I-5 is not an officially designated state scenic highway and visual changes would be minor as viewed from such a distance, impacts to scenic resources within the eligible state scenic highway would be **less than significant**.

Threshold C: Would the Project substantially degrade the existing visual character or quality of public views of the site and its surroundings?

The development standards and design guidelines of the Specific Plan aim to carry out the goals and policies of the City's Community Plan and LCP, as amended in the Specific Plan. According to City regulations, proposed designs must be "appropriately scaled with other structures in the neighborhood" (23.08.077, C) and must be "in harmony with neighborhood character" in terms of design, scale, bulk, coverage and exterior appearance (30.31.060). In order to maintain scenic quality and ensure harmony with existing neighborhood character, the Specific Plan Design Guidelines govern site design, architectural character, building orientation, massing and scale, exterior materials and finishes, exterior lighting, walls, fencing and screening, landscaping and signage.

In accordance with the Specific Plan Design Guidelines (Dudek 2019), the Project would feature a combination of one-, two- and three-story structures, with the highest structures (maximum of 46 feet tall) clustered in the middle of the Project site to minimally disrupt existing coastal views available from off-site locations. Based on the Conceptual Site Plan (see Figure 2b), the siting and positioning of on-site buildings and the parking structure achieve a low profile resulting in primarily maintained coastal views from nearby private residential properties and outdoor gathering spaces (see Figure 16b, Figure 25b, and Figure 27b). Additionally, architectural design would emphasize horizontal elements over vertical ones to tie the buildings to the landscape. The placement of buildings considers the organic, undulating edges of the bluff and the existing natural topography in order to achieve a design that conceals building mass and scale and preserves views. The heights of the proposed structures (maximum of 46 feet) would be similar to the canopies of existing mature trees on site in order to minimally disrupt available coastal views from the surrounding area. Further, in accordance with the Specific Plan and City regulations for bluff development, structures would be required to be set back from the top of the bluff a minimum of 40 feet, condensing structures toward the central and eastern portions of the site.

Existing neighboring development adjacent to the north in Solana Beach consists of three- and four-story, multifamily condominium structures (e.g., the Del Mar Beach Club and Del Mar Shores Terrace). However, southerly views toward the Project site from the residential neighborhood immediately north of the Project site would be noticeably shortened (see Figure 17b). Southerly views of views of the primarily vacant, vegetated bluff top would be replaced with landscaping, access roads and multistory buildings. From certain public vantage points that view

the Project site from foreground and middle ground distances (see Key Views 1, 6, and 7), the Project would alter the primarily natural appearance of the bluff.

As previously mentioned, the removal of select vegetation from the Project site would be required to accommodate the proposed Project and would be noticeable from public vantage points in the surrounding area. However, site development would include the installation of new landscaping, and select tree species would be retained and relocated on site. Transitional edge treatments would be included in the areas visible from public spaces. Where appropriate, the edge treatment would include installation of landscaping to further soften the edge appearance. In addition, and as depicted on Figure 6, development of the site would include installation of bluff top restoration planting zones that would consist of a tailored plant palette of endemic shrub species to promote stabilization and beautification of the coastal environment. This area would provide a backdrop to the public access trail and enhance user experience of the walking and seating areas. It should be noted that the Project would result in the creation of new public vantage points with ocean and coastal views. Large open-space courtyard areas would provide coastal views and the proposed access path would provide new and improved pedestrian access to the James Scripps Bluff Preserve where visitors are provided panoramic ocean views.

The scale of proposed development would be noticeable when viewed from an immediate foreground distance such as from Border Avenue/South Sierra Avenue (see Key View 2; Figure 17b) or from within the James Scripps Bluff Preserve (see Key View 13; Figure 28b). From more distant viewing locations the apparent scale of proposed structures would be reduced. For example, as experienced at Key View 4, (i.e., Via de la Valle at South Cedros Avenue), the one- to three-story scale of proposed buildings (see Figure 19b) would be visible but would be comparable to the two- and three-story scale of surrounding development in the Via de la Valle corridor. Further, at Key View 8 (located 0.3 miles southwest of the Project site) the scale of the proposed development would be moderated by distance and existing trees on site that display comparable scale (see Figure 23b). And from coastal viewing locations and relatively distant and elevated vantage points such as Key View 11 and Key View 12, the mass and scale of the Project would be partially obscured by distance as well as existing and proposed landscaping (see Figures 26b and 27b).

In accordance with the Specific Plan, the Project would implement coastal-inspired architectural character that blends harmoniously with the character of existing surrounding development and coastal bluff. The colors of materials consist of warm, natural tones and may include the following materials: wood siding/rain screen, terra-cotta rain screen, synthetic wood composite, and cementitious composite siding. As experienced at Key Views 1, 2, 3 and 4, use of contemporary materials (primarily natural appearing wood) in architectural finishes of proposed buildings would be evident as the structures would display warm tones of brown that mimic natural wood (see Figures 16b, 17b, 18b, and 19b). Project architecture would incorporate lightly colored concrete

in the structural aspects of buildings. Similarly, lightly colored (and darker) finishes are currently displayed in the surrounding area by existing residential, office, and commercial development (see Figures 11, 12, and 13). As such, incorporation of lightly colored finishes would not be unique to the Project site and would not result in the substantial degradation of existing visual character and quality. Further, the architectural design would emphasize horizontal elements over vertical ones to tie the building to the landscape and to help reduce the appearance of height and scale. The horizontal form of proposed buildings is depicted in visual simulations prepared from Key Views 1, 7, 8, 9, 10 and 11 (see Figures 16b, 22b, 23b, 24b, 25b, and 26b). Subtle variations and site-specific adjustments of architectural facades would also be incorporated to help reduce scale and to appear as a more organic pattern of development while creating visual interest.

As detailed above, implementation of the Project would change the existing character of the primarily vacant site. From a visual perspective, the mass and one- to three-story scale of buildings on the Project site would be consistent with the massing of the surrounding area that includes two- to three-story scale buildings north of the Project site. Specifically, existing two-story multifamily development buildings are located north of the site along Border Avenue and South Sierra Avenue and a three-story office building is located approximately 70 feet away at the northwestern corner of Highway 101 and Border Avenue. These existing structures display primarily stucco exteriors and wood paneled roofs, and contribute multistory building scale and multibuilding properties to the immediate area.

Overall, implementation of the Project would alter the existing character and quality of the natural appearance of the site. As viewed from Key Views 1, 2, 6, 7, the natural bluff-top character would be replaced with that of resort development. Therefore, the introduction of multiple one- to three-story structures to the primarily vacant site would result in a substantial change to the character and quality of the distinct landform. However, as analyzed Section 5.3, Kew View Assessment, these changes do not represent a substantial degradation of visual character to the Project site and surrounding area.

Threshold D: Would the Project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Construction

The site is primarily undeveloped and contains limited sources of existing lighting and glare associated with the existing on-site residence. Construction of the Project would be limited to daylight hours between 7:00 a.m. and 7:00 p.m., and construction lighting would not generally be required. However, construction activities including the delivery of materials and more focused earthwork or building construction occurring in later months of the year may temporarily require or result in a need for artificial lighting during nighttime hours. In these limited instances, construction

lighting would be focused on the active area of construction and would be directed downward to minimize the potential for light trespass and skyglow. Because potential sources of nighttime lighting during construction would not be regularly occurring, temporary use of limited construction lighting would not substantially affect existing nighttime views. Therefore, lighting and glare impacts to existing nighttime and daytime views during construction would be **less than significant**.

Lighting

Operation of the proposed Project would introduce numerous sources of permanent exterior nighttime lighting. For example, new sources of lighting would be associated with proposed resort pathway/safety lighting, accent lighting, and architectural lighting (refer to Figure 3). As depicted on Figure 3, and as described in Chapter 4 and 5 of the Specific Plan (Dudek 2019), pathway lighting would be primarily located along the perimeter of the resort, framing the emergency access pathways. Illumination from pathway lighting would range from 1-5 foot-candles, and fixtures would be relatively low in profile, and would be directed away from adjacent properties and public rights-of-way. Also, low foot-candle lighting elements would primarily installed along the development side (i.e., eastern side) of the loop trail closest to the bluff edge. Siting and the installation of low foot-candle fixtures would prevent light spillover from these sources onto the beach. Additionally, low-voltage lighting fixtures would be used along the loop trail. Accent lighting would be located throughout internal portions of the resort among open space areas and landscaping; providing lighting on focal points and objects surrounding the main road leading to the arrival court, pools and spas, fountains, and events garden. Illumination from accent lighting would range from 1-5 foot-candles and fixtures would be located low to the ground or in locations out of sight. Further and as stated in Table 1, lighting that is installed adjacent to open space areas (including the James G. Scripps Bluff Preserve) would be shielded and directed away from those areas so as to prevent light spillover. Architectural lighting would be located throughout the development in order to illuminate areas around the resort guestrooms and resort villas, and to emphasize elevation changes and barriers. Illumination from architectural lighting would range from 5-10 foot-candles.

Consistent with Design Guidelines outlined within Chapter 5 of the Specific Plan, lighting fixture selection for the Project would be tailored to frame each distinct area within the property while concentrating on prevention of light pollution and glare. Further, all lighting materials would be selected for their durability, suitability for the coastal environment, and compatibility with the resort's architecture. In addition, all exterior lighting fixtures would be positioned to illuminate outdoor use areas such as pools, spas, event gardens, internal walkways, and the arrival court and other drop-off areas. Energy conservation, safety, and security would be emphasized when designating the lighting system. The Project would incorporate gradual reduction of light intensity between major points of activity, in order to provide the desired modulation of light without sacrificing safety and utility. Additionally, lighting illumination would be directed downward to minimize the spread of the beam, and all exterior lights would be hooded or shielded.

Lighting fixture types, quantities, and locations would be taken into consideration to accommodate on-site needs, the surrounding environment, and City lighting policies. In addition, the Specific Plan indicates the installation of low foot-candle lighting elements across the majority of the Project site and lighting installed adjacent to open space areas would be shielded and directed away from those areas to prevent light spillover. However, implementation of the proposed Project would substantially increase of the amount of operational lighting atop the bluff in comparison to existing conditions. As existing development on site is primarily shielded from public viewing by existing landscaping and setback, the visibility of nighttime lighting at the Project site under existing conditions is extremely limited. Therefore, the introduction of multiple sources of nighttime lighting to the primarily vacant site associated with the proposed development would result in a **potentially significant impact** related to existing nighttime views and more specifically, light trespass onto adjacent residential properties to the north.

With implementation of Mitigation Measure VIS-1, impacts associated with Project lighting and light trespass onto adjacent residential properties would be reduced to a less than significant level.

Mitigation Measure VIS-1: The Project applicant shall prepare a detailed Lighting Plan and photometric study for the proposed development. The Lighting Plan shall be prepared by a qualified lighting engineer or lighting profession. The Lighting Plan shall indicate the location of all lighting fixtures to be installed and the intensity/characteristics of each luminaire. A detailed lighting schedule shall be included in the Lighting Plan. A photometric study that details anticipated light spillover and light levels on adjacent properties and roads shall also be prepared and submitted to the City of Del Mar for review and comment.

Glare

The architectural and environmental design of the Project would include potentially reflective surfaces. Glass and rooftop solar panels are the primary sources of potential glare that would be installed on the Project site. Regarding glass associated with windows, walls or other elements of proposed buildings, the Specific Plan includes glass specifications that would minimize potential glare generated by glass elements. For example, the Specific Plan includes specifications that installed glass should be highly transparent with low reflectivity and little to no color tinting. Also, all installed glass shall be required to meet California Building Code standards. Installation of low reflectivity glass would minimize opportunities for Project buildings to generate daytime glare that would be received by off-site receptors and adversely affect the quality of daytime views. Further, proposed building roofs would be lightly colored “cool roofs” in order to minimizing solar heat gain into buildings and minimize the potentially reflective properties of roof finishes.

As indicated in the Specific Plan, solar panels may be installed on proposed buildings to generate on-site electricity for use in Project operations. If installed, rooftop solar panels would primarily display flat, horizontal form that would mimic the horizontal form of proposed building roof line. While specific panels and racking systems to support the rooftop panels are not yet known, this analysis assumes that the greatest potential for glare to be generated by proposed solar panels and received at off-site land uses (including residential land uses to the east) would be during late afternoon/evening hours. In the hours approaching sunset, the sun lowers towards the western horizon and displays an increasingly low angle in the sky. Despite the potential for rooftop solar panels to generate glare received at off-site viewing locations, photovoltaic solar panels would feature a dark surface and anti-reflective coating. In addition, photovoltaic solar panels are designed to be highly absorptive of all light that strikes the panel surfaces, generating electricity rather than reflecting light. In regards to glare and reflectance levels, typical solar panels have a lower index of refraction/reflectivity then common sources of glare in residential and commercial environments include steel, standard glass, plexiglass, and smooth water (Shields 2010). The glare and reflectance levels of most modules are further reduced with the incorporation of stippled glass "texturing" that allows more light energy to be channeled/transmitted through the glass while weakening the reflected light. With application of anti-reflective coatings and use of modern glass technology, proposed rooftop solar panels installed at the Project would display overall low reflectivity. As such, the potential installation of solar panels atop proposed buildings would not create a new source of substantial glare that would adversely affect daytime views in the area. Impacts would be **less than significant**.

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SOURCE: DUDEK

FIGURE 1

Project Location

Marisol Project Visual Impact Assessment

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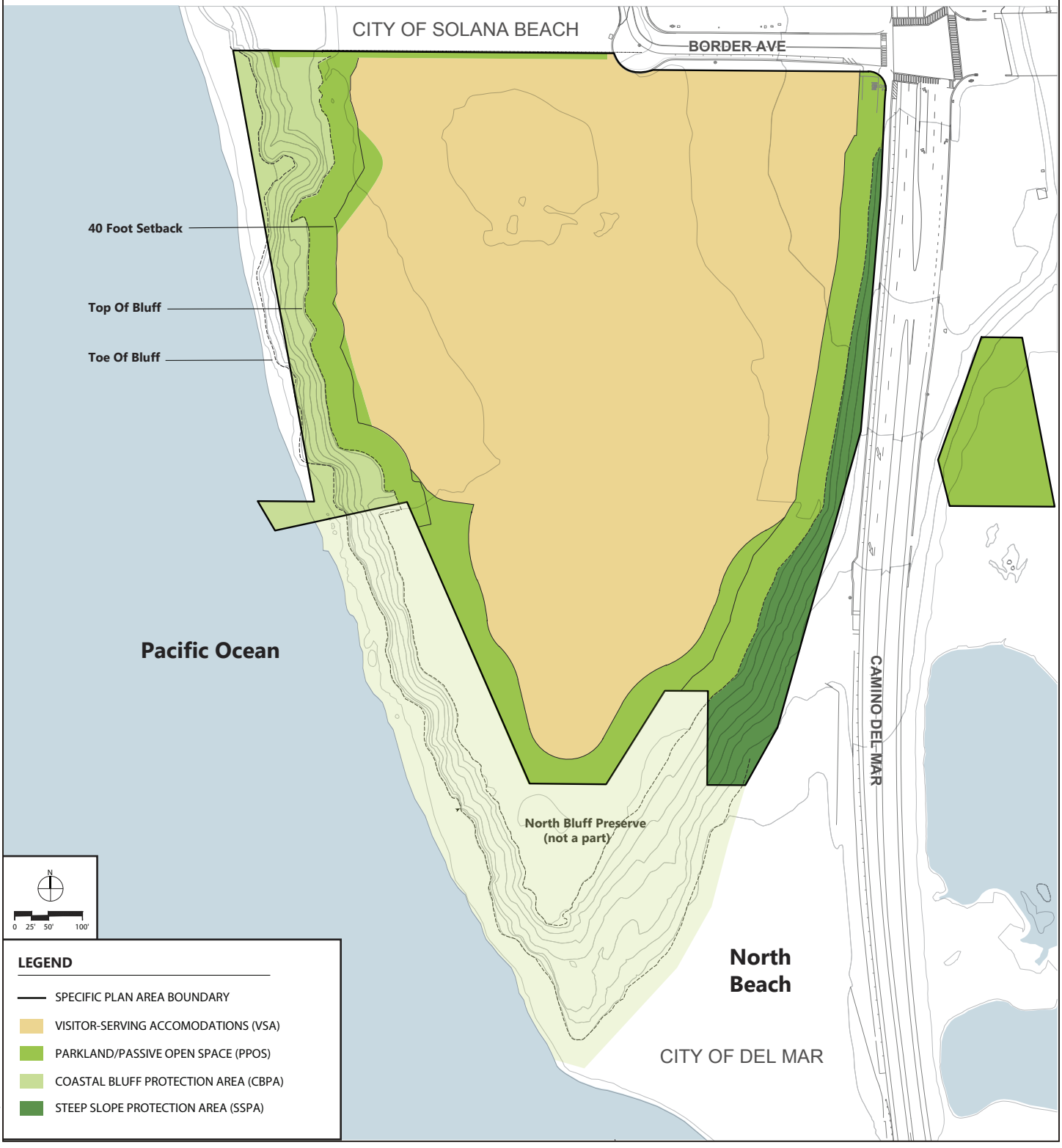

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FIGURE 2a

Land Use Plan

Marisol Project Visual Impact Assessment

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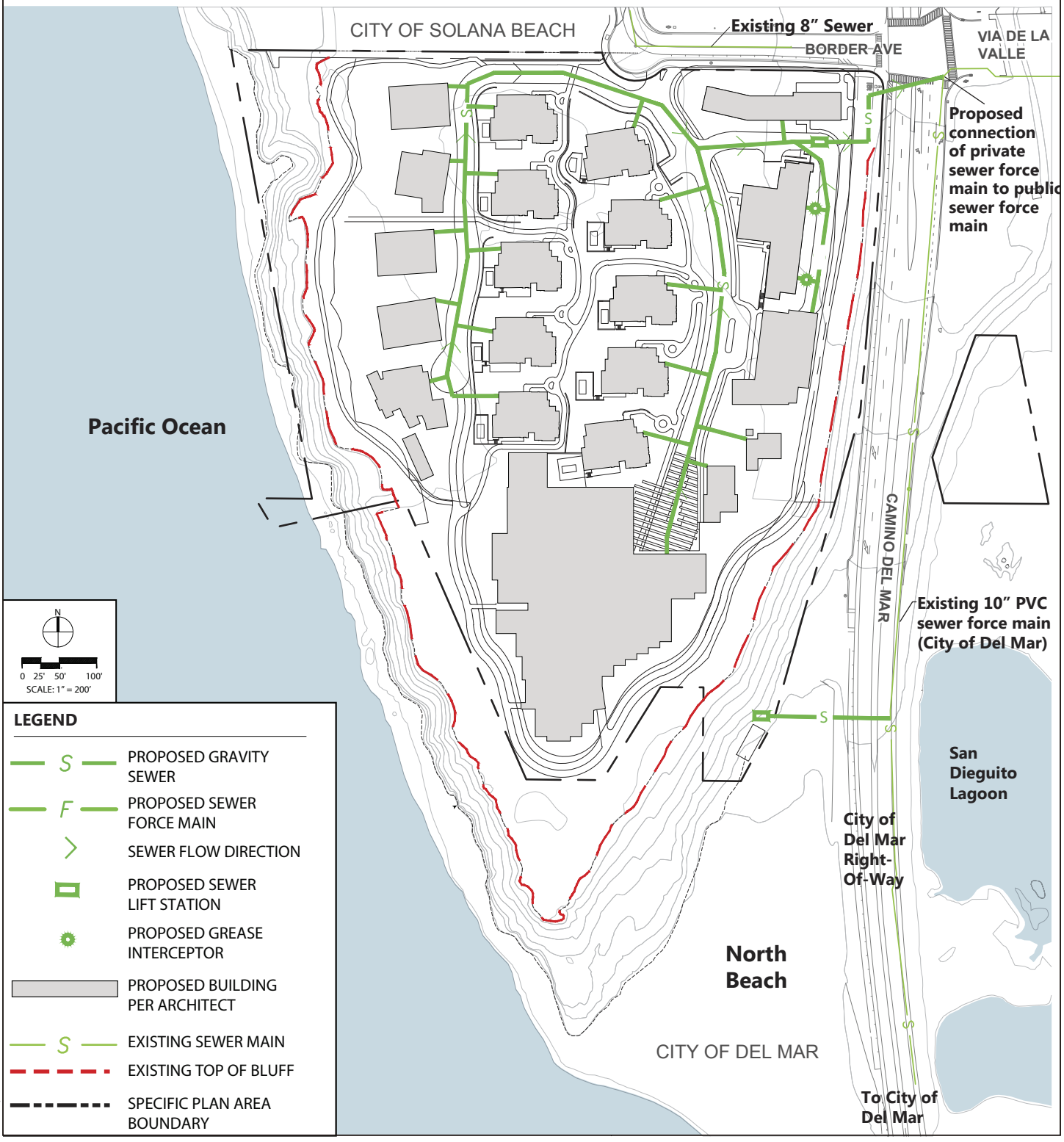

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FIGURE 2b

Conceptual Site Plan

Marisol Project Visual Impact Assessment

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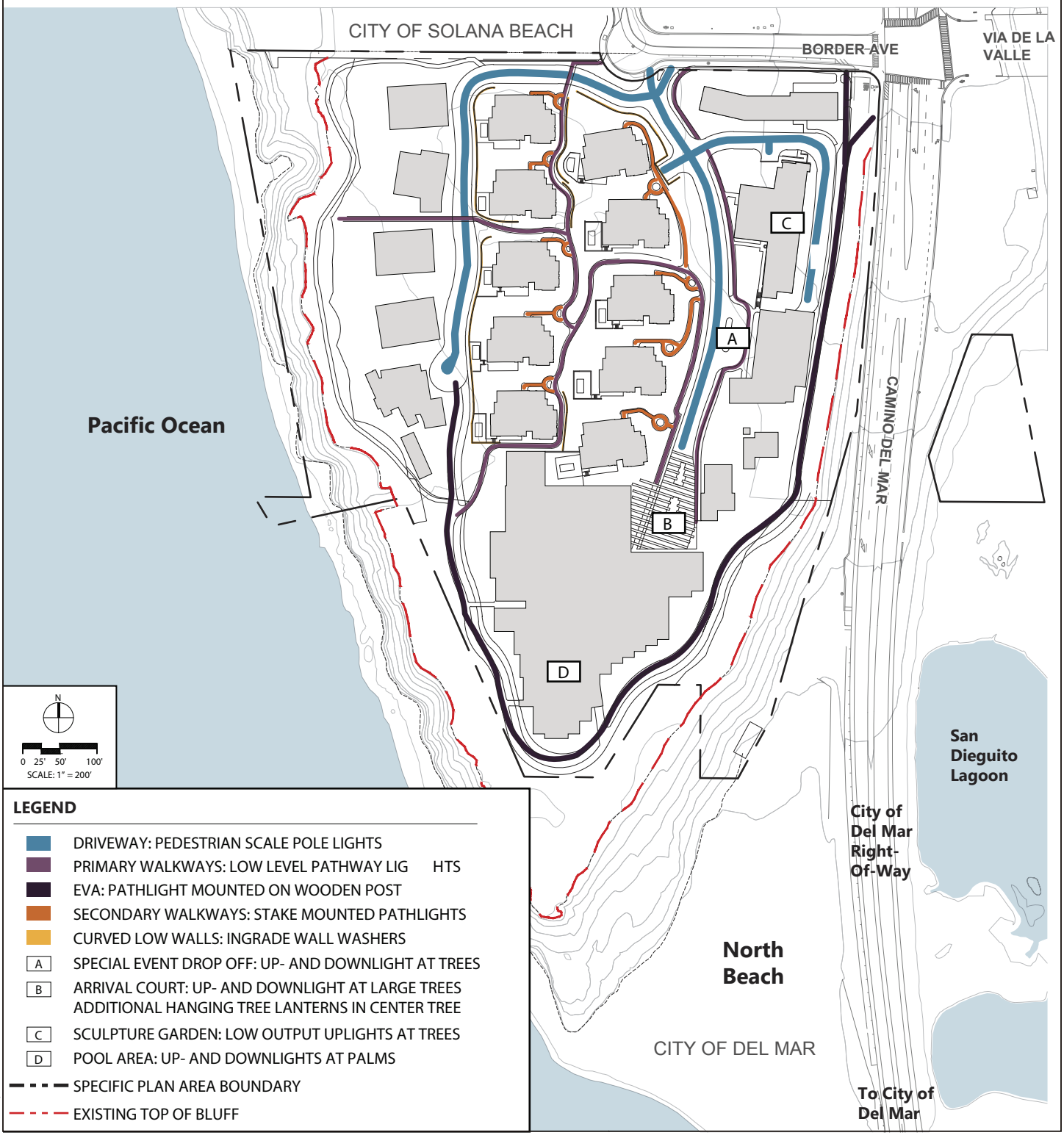

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FIGURE 3

Conceptual Lighting Plan

Marisol Project Visual Impact Assessment

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FIGURE 4

Conceptual Fencing

Marisol Project Visual Impact Assessment

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FIGURE 5

Conceptual Signage

Marisol Project Visual Impact Assessment

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SOURCE: DUDEK

FIGURE 6

Conceptual Planting Plan

Marisol Project Visual Impact Assessment

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Project Site

Zoning (City of Solana Beach)

- ER, Estate Residential 1 DU/Acre
- ER-2, Estate Residential 1-2 DU/Acre
- LRc, Low Residential 3 DU/Acre
- LRd, Low Residential 3 DU/Acre
- LMRc, Low-Medium Residential 4 DU/Acre
- LMRd, Low-Medium Residential 4 DU/Acre
- MR, Medium Residential 5-7 DU/Acre
- MHR, Medium-High Residential 8-12 DU/Acre
- HR, High Residential 13-20 DU/Acre
- SC, Special Commercial
- LC, Light Commercial
- C, General Commercial
- LI, Light Industrial
- OP, Office/Professional
- PI, Public/Institutional
- ROW, Road Right-of-Way
- LR/SP, Low Residential/Specific Plan
- OSR/SP, Open Space Recreation/Specific Plan
- OSR, Open Space/Recreation

Zoning (City of Del Mar)

- R1-40, Very Low Density
- R1-14, Modified Low Density
- R1-10, Low Density
- R1-15, Medium Density (Single Family)
- RM, Medium Density (Mixed)
- R2, High Density
- RC, Residential Commercial
- CC, Central Commercial
- BC, Beach Commercial
- PC, Professional Commercial
- NC, North Commercial
- VC, Visitor Commercial
- FR, Fairgrounds (Racetrack)
- RR, Railroad Right-of-Way
- FW, Floodway
- PP, Public Parkland
- PF, Public Facilities
- GSP, Garden Specific Plan
- PSP, Plaza Specific Plan
- HSP, Hotel Specific Plan

SOURCE: Bing Maps 2018; SANGIS

DUDEK 0 1,000 2,000 Feet

FIGURE 7

Zoning

Marisol Project Visual Impact Assessment

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SOURCE: SANGIS 2017

DUDEK

0 265 530 Feet

FIGURE 8

Project Setting Photographs Key Map

Marisol Project Visual Impact Assessment

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Photo A: Looking southwest from northeastern corner of the Project Site

Photo B: Looking west from Border Avenue to north portion of Project Site, access easement/path (no coastal access provided), and adjacent residential buildings

Photo C: Looking west from previously disturbed central portion of Project Site

Photo D: Looking east to landscaping on previously disturbed central portion of Project Site

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FIGURE 9

Project Setting (1 of 5)

Marisol Project Visual Impact Assessment

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Photo E: Looking north from southern portion of Project Site to existing on-site residence, landscaping and paths

Photo F: Looking south from southern portion of Project Site towards Del Mar coastline

Photo G: Looking north from James G. Scripps Bluff Preserve (Del Mar) to southern portion of Project Site

Photo H: Looking south from Border Avenue to driveway to central and southern portions of Project Site

FIGURE 10

Project Setting (2 of 5)

Marisol Project Visual Impact Assessment

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Photo I: Looking northwest from South Sierra Avenue to two-story residential development and landscaping in Solana Beach

Photo J: Looking north from Border Avenue to three-story office development in Solana Beach

Photo K: Looking west from South Sierra Avenue to two-story residential development in Solana Beach

Photo L: Looking west from Highway 101 sidewalk to three-story hotel and two-story Solana Beach City Hall development

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FIGURE 11

Project Setting (3 of 5)

Marisol Project Visual Impact Assessment

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Photo M: Looking southwest from Highway 101 sidewalk to commercial, residential, and hotel development in Solana Beach

Photo N: Looking north from Camino Del Mar pedestrian bridge (Del Mar) to North Beach and Project Site

Photo O: Looking southwest from Camino Del Mar to the Brigantine Restaurant and San Dieguito Lagoon in Del Mar

Photo P: Looking east from James G. Scripps Bluff Preserve (Del Mar) to San Dieguito Lagoon, Del Mar Fairgrounds and surrounding area

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FIGURE 12

Project Setting (4 of 5)

Marisol Project Visual Impact Assessment

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Photo Q: Looking west from Via de la Valle (Del Mar) to residential development, landscaping, and Project Site

Photo R: Looking north from River Path (Del Mar) across San Dieguito Lagoon to Project Site and Del Mar and Solana Beach residential development

Photo S: Looking southwest from West Solana Circle (Solana Beach) to residential development, Project Site, and ocean

Photo T: Looking southeast from South Cedros Avenue (Solana Beach) to two-story residential development in varied architectural styles

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FIGURE 13

Project Setting (5 of 5)

Marisol Project Visual Impact Assessment

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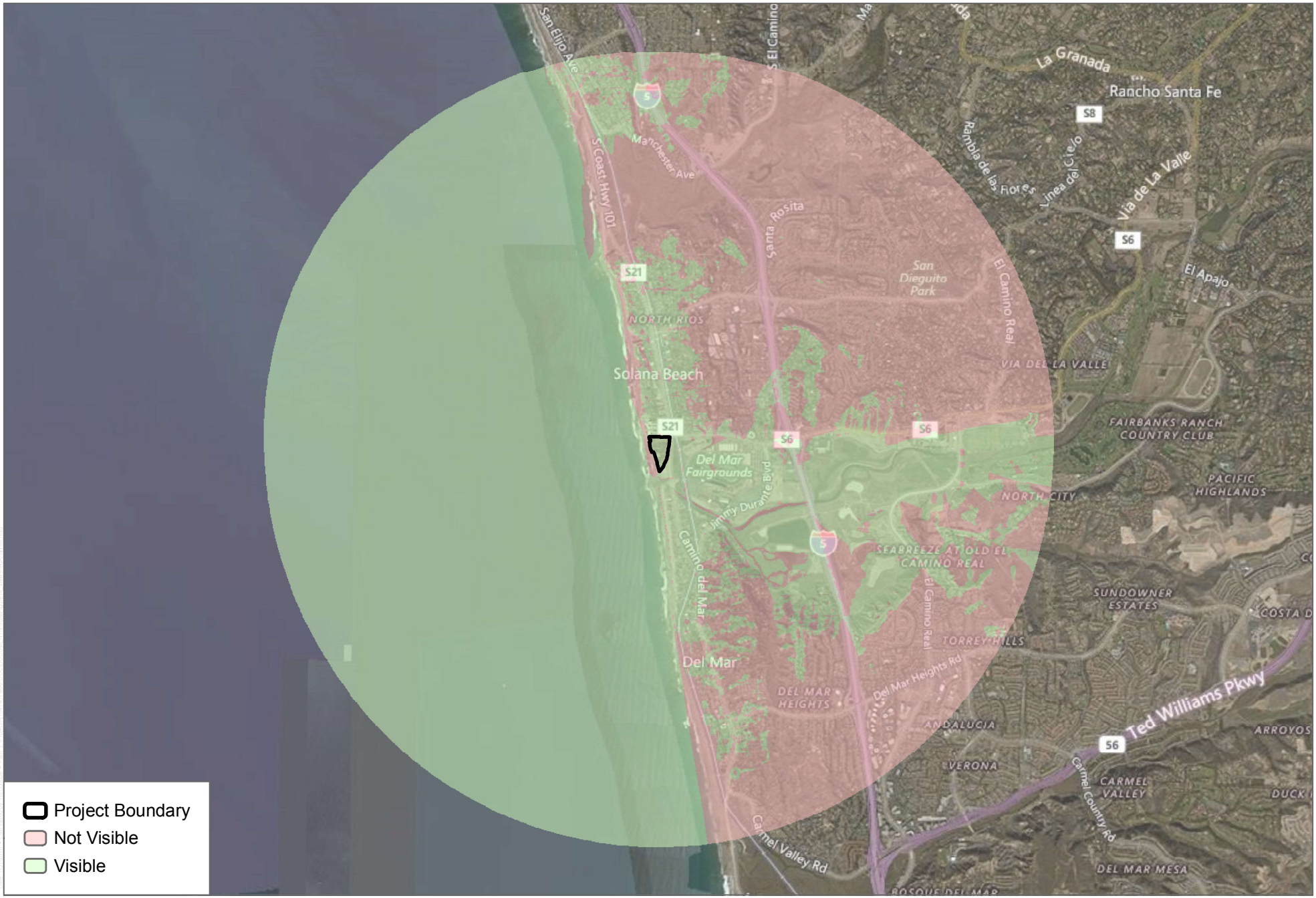

SOURCE: Bing Maps 2018

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FIGURE 14

Viewshed Analysis

Marisol Project Visual Impact Assessment

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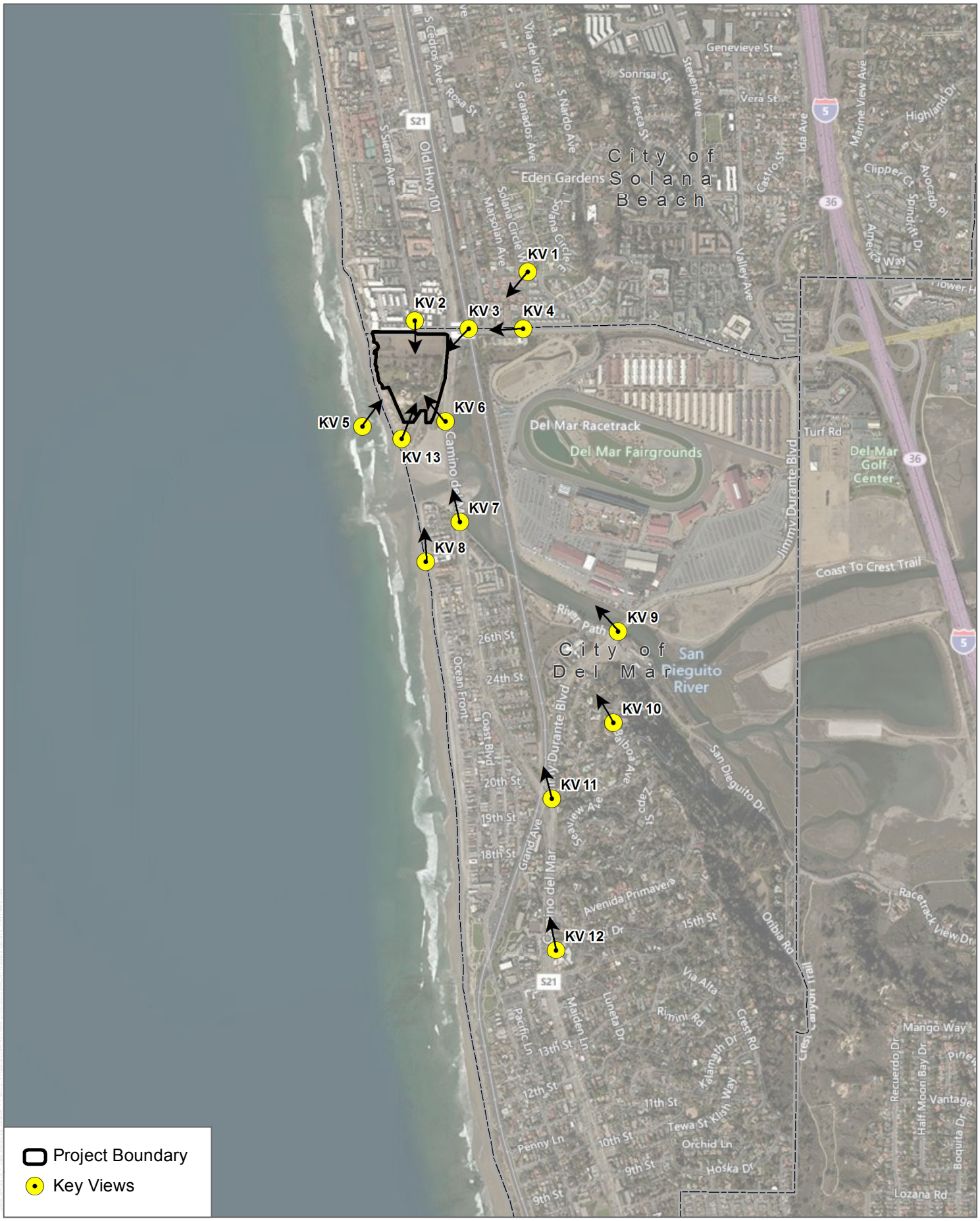

SOURCE: Bing Maps 2018

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0 700 1,400 Feet

FIGURE 15

Key Views

Marisol Project Visual Impact Assessment

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Existing view southwest from West Solana Circle towards Project Site (located approximately 0.25-mile away)

FIGURE 16a

Key View 1 - West Solana Circle (City of Solana Beach)

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project

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FIGURE 16b

Key View 1 - West Solana Circle (City of Solana Beach)

Marisol Project Visual Impact Assessment

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Existing view south from South Sierra Avenue towards Project Site (located approximate 130 feet away)

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FIGURE 17a

Key View 2 - South Sierra Avenue (City of Solana Beach)

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project

FIGURE 17b

Key View 2 - South Sierra Avenue (City of Solana Beach)

Marisol Project Visual Impact Assessment

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Existing view west from Via de la Valle at Highway 101 towards Project Site (located approximately 130 feet away)

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FIGURE 18a

Key View 3 - Via de la Valle at Highway 101

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project

FIGURE 18b

Key View 3 - Via de la Valle at Highway 101

Marisol Project Visual Impact Assessment

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Existing view west from Via de la Valle towards Project site (located approximately 420 feet away)

FIGURE 19a

Key View 4 - Via de la Valle at South Cedros Avenue

Marisol Project Visual Impact Assessment

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Visual Simulation of Project

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FIGURE 19b

Key View 4 - Via de la Valle at South Cedros Avenue

Marisol Project Visual Impact Assessment

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Existing view east from the Del Mar Beach towards the Project site (located approximately 120 feet away)

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FIGURE 20a

Key View 5 - Del Mar Coastline northwest of North Beach

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project (Project Not Visible)

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FIGURE 20b

Key View 5 - Del Mar Coastline northwest of North Beach

Marisol Project Visual Impact Assessment

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Existing view northwest from Camino Del Mar towards the Project site (located approximately 230 feet away)

FIGURE 21a

Key View 6 - Camino Del Mar (North of Lagoon Bridge)

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project

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FIGURE 21b

Key View 6 - Camino Del Mar (North of Lagoon Bridge)

Marisol Project Visual Impact Assessment

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Existing view northwest from Camino Del Mar towards Project site (located approximately 0.25-mile away)

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FIGURE 22a

Key View 7 - Camino Del Mar (South of Lagoon Bridge)

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project

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FIGURE 22b

Key View 7 - Camino Del Mar (South of Lagoon Bridge)

Marisol Project Visual Impact Assessment

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Existing view north from Del Mar coastline towards Project site (located approximately 0.30-mile away)

FIGURE 23a

Key View 8 - Del Mar Coastline South of North Beach

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project

FIGURE 23b

Key View 8 - Del Mar Coastline South of North Beach

Marisol Project Visual Impact Assessment

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Existing view northwest towards Project site (located approximately 0.65-mile away)

FIGURE 24a

Key View 9 - Jimmy Durante Boulevard at San Dieguito River Bridge

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project

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FIGURE 24b

Key View 9 - Jimmy Durante Boulevard at San Dieguito River Bridge

Marisol Project Visual Impact Assessment

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Existing view northwest from Balboa Avenue towards Project site (located approximately 0.80-mile away)

FIGURE 25a

Key View 10 - Balboa Avenue (City of Del Mar)

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project

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FIGURE 25b

Key View 10 - Balboa Avenue (City of Del Mar)

Marisol Project Visual Impact Assessment

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Existing view northwest from Camino Del Mar towards Project site (located approximately 0.90-mile away)

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FIGURE 26a

Key View 11 - Camino Del Mar at Jimmy Durante Boulevard

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project

FIGURE 26b

Key View 11 - Camino Del Mar at Jimmy Durante Boulevard

Marisol Project Visual Impact Assessment

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Existing view north from Del Mar Plaza towards Project site (located approximately 1.2 miles away)

FIGURE 27a

Key View 12 - Del Mar Plaza Roof Deck

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project

FIGURE 27b

Key View 12 - Del Mar Plaza Roof Deck

Marisol Project Visual Impact Assessment

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Existing view north from James Scripps Bluff Preserve Trail towards Project site (located approximately 190 feet away)

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FIGURE 28a

Key View 13 - James Scripps Bluff Preserve Trail

Marisol Project Visual Impact Assessment

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Conceptual Visual Simulation of Project

FIGURE 28b

Key View 13 - James Scripps Bluff Preserve Trail

Marisol Project Visual Impact Assessment

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Appendix C

Air Quality and Greenhouse Gas Emissions Analysis Technical Report

Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Marisol Project City of Del Mar, California

Prepared for:

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Del Mar, California 92014

Prepared by:

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NOVEMBER 2019

Printed on 30% post-consumer recycled material.

TABLE OF CONTENTS

Section **Page No.**

EXECUTIVE SUMMARY VII

1 INTRODUCTION 1
1.1 Report Purpose and Scope 1
1.2 Project Location 1
1.3 Project Description 2
1.4 Project Design Features 3

2 AIR QUALITY 9
2.1 Environmental Setting 9
2.1.1 Climate, Meteorological, and Topographical Conditions 9
2.1.2 Pollutants and Effects 11
2.1.3 Sensitive Receptors 18
2.2 Regulatory Setting 18
2.2.1 Federal Regulations 18
2.2.2 State Regulations 19
2.2.3 Local Regulations 22
2.3 Regional and Local Air Quality Conditions 27
2.3.1 San Diego Air Basin Attainment Designation 27
2.3.2 Local Ambient Air Quality 28
2.4 Significance Criteria and Methodology 30
2.4.1 Thresholds of Significance 30
2.4.2 Approach and Methodology 33
2.5 Impact Analysis 38
2.5.1 Would the project conflict with or obstruct implementation of the applicable air quality plan? 38
2.5.2 Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation? 40
2.5.3 Would the project 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)? 43
2.5.4 Would the project expose sensitive receptors to substantial pollutant concentrations? 44
2.5.5 Would the project create objectionable odors affecting a substantial number of people? 52

TABLE OF CONTENTS (CONTINUED)

Section **Page No.**

3 GREENHOUSE GAS EMISSIONS 53
3.1 Environmental Setting 53
3.1.1 Climate Change Overview 53
3.1.2 Greenhouse Gases 54
3.1.3 Global Warming Potential 55
3.2 Regulatory Setting 56
3.2.1 Federal Regulations 56
3.2.2 State Regulations 58
3.2.3 Local Regulations 72
3.3 Greenhouse Gas Inventories and Climate Change Conditions 73
3.3.1 Sources of Greenhouse Gas Emissions 73
3.3.2 Carbon Sequestration 74
3.3.3 Potential Effects of Climate Change 75
3.4 Significance Criteria and Methodology 79
3.4.1 Thresholds of Significance 79
3.4.2 Approach and Methodology 82
3.5 Impact Analysis 86
3.5.1 Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? 86
3.5.2 Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? 90
4 REFERENCES CITED 109
5 LIST OF PREPARERS 117

APPENDICES

A CalEEMod Output Files
B CO Hot Spot Analysis
C Renewable Energy Generation Calculations
D Efficiency Metric Calculations

TABLE OF CONTENTS (CONTINUED)

Page No.

FIGURES

1 Regional Map 5
2 Vicinity Map 7

TABLES

1 Ambient Air Quality Standards 19
2 San Diego Air Basin Attainment Classification 27
3 Local Ambient Air Quality Data 29
4 San Diego Air Pollution Control District Air Quality Significance Thresholds 31
5 Construction Scenario Assumptions 34
6 Project Trip Rate Assumptions 37
7 Estimated Maximum Daily Construction Criteria Air Pollutant Emissions 41
8 Estimated Maximum Daily Operational Criteria Air Pollutant Emissions 42
9 CALINE4 Predicted Carbon Monoxide Concentrations 48
10 Pollutants, Sources, Health Effects, and Attainment Status 49
11 Greenhouse Gas Emissions Sources in California 74
12 2020 and 2035 Calculated Efficiency Metric 81
13 2023 Interpolated Efficiency Metric 81
14 Estimated Annual Construction GHG Emissions 87
15 Vegetation Removal – Estimated Loss of Sequestered Carbon 87
16 Removed Trees – Estimated Loss of Sequestered Carbon 88
17 Estimated Annual Operational GHG Emissions 89
18 Planted Trees – Estimated Gain of Sequestered Carbon 89
20 Project Consistency with the City of Del Mar CAP 91
21 San Diego Forward: The Regional Plan Consistency Analysis 93
22 Greenhouse Gas Related Laws and Regulations 96

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
2030 Scoping Plan	*2017 Climate Change Scoping Plan Update*
2050 RTP/SCS	*2050 Regional Transportation Plan/Sustainable Communities Strategy*
°C	degrees Celsius
°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AB	Assembly Bill
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CALGreen	California's Green Building Standards
CALINE4	California LINE Source Dispersion Model
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	methane
City	City of Del Mar
CNRA	California Natural Resources Agency
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	San Diego County
CPUC	California Public Utilities Commission
DPM	diesel particulate matter
EO	Executive Order
EPA	U.S. Environmental Protection Agency
First Update	*First Update to the Climate Change Scoping Plan: Building on the Framework*
GHG	greenhouse gas
GWP	global warming potential
HAPs	hazardous air pollutants
HFC	hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
LOS	level of service
MMT	million metric ton
MPO	metropolitan planning organization
MT	metric tons
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NHTSA	National Highway Traffic Safety Administration

Acronym/Abbreviation	Definition
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
O_3	ozone
PDFs	Project Design Features
PFC	perfluorocarbon
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
Ppb	parts per billion
Ppm	parts per million
Project	Del Mar Beach Resort Project
RAQS	Regional Air Quality Strategy
Regional Plan	*San Diego Forward: The Regional Plan*
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
Scoping Plan	*Climate Change Scoping Plan: A Framework for Change*
SCS	Sustainable Communities Strategy
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
SO_x	sulfur oxides
TAC	toxic air contaminants
Under 2 MOU	Global Climate Leadership Memorandum of Understanding
VMT	vehicle miles traveled
VOC	volatile organic compound
ZNE	zero net energy

EXECUTIVE SUMMARY

The purpose of this technical report is to assess the potential air quality and greenhouse gas (GHG) emissions impacts associated with implementation of the proposed Marisol (project) located within the City of Del Mar (City). This assessment utilizes the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.).

Project Overview

The Plan Area includes approximately 17.45 acres of land, located at Border Avenue and west of Camino Del Mar, as well as a portion east of Camino Del Mar, in the northwestern corner of the City of Del Mar. The Plan Area is comprised of 16.55 acres of privately owned land, 0.78-acre of public right-of-way along Camino Del Mar, and a 0.12-acre City coastal viewing access parcel located at the northern extent of the Plan Area. The Specific Plan Area would be accessible from the intersection of South Sierra Avenue and Border Avenue on the northern side of the Plan Area

The project consists of a Specific Plan including five land use sub-designations: Visitor Serving Accommodations (VSA), Parkland/Passive Open Space (PPOS), Coastal Bluff Protection Area (CBPA) and Steep Slope Protection Area (SSPA). The VSA land use sub-designation allows for the development of approximately 65 hotel guest rooms, 31 villas (some of which may be used as hotel guest rooms when not in use by owners, subject to provisions in the Specific Plan), 10 lower-cost shared visitor-serving accommodations, 22 affordable housing units, and associated amenities. Amenities include, but are not limited to, restaurants, bar/lounge, special event space, meeting space, swimming pools, a spa and fitness center and retail.

The PPOS land use sub-designation allows for public amenities such as trails, vista points, picnic areas, public access stairway and public restrooms, and passive recreational uses. Passive recreational uses are defined in the Specific plan as low intensity recreational activities that require little or no infrastructure and that are geared toward the viewing and appreciation of scenic and environmentally sensitive areas.

The CBPA and SSPA land use sub-designations serve as protection areas. The only disturbance allowed within the CBPA is the minimal amount necessary to install drainage control measures to protect a coastal bluff area from degradation and/or erosion. Shoreline protection devices are prohibited in this area. The only disturbance allowed within the SSPA is the minimal amount necessary to provide a public access stairway, public restrooms, and related facilities for hotel and public visitor services at the toe of slope; to implement drainage control measures to protect the steep slope area from degradation and/or erosion; and to allow interpretive signage and pathway lighting.

The project site is located within the San Diego Air Basin (SDAB) and is within the jurisdiction of the San Diego Air Pollution Control District (SDAPCD). Construction and operational criteria air pollutant and GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2, consistent with SDAPCD guidance.

Air Quality

The air quality impact analysis evaluated the potential for adverse impacts to air quality due to construction and operational emissions resulting from the project. Impacts were evaluated for their significance based on the SDAPCD mass daily criteria air pollutant thresholds of significance (SDAPCD 2007). Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. Criteria air pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and lead. Pollutants that are evaluated include volatile organic compounds (VOCs), oxides of nitrogen (NO_x), CO, sulfur oxides (SO_x), PM_{10}, and $PM_{2.5}$. VOCs and NO_x are important because they are precursors to O_3.

Air Quality Plan Consistency

Regarding consistency with local air quality plans, the project would result in a more intensive land use than currently allowed under the City's 1985 Community Plan (City of Del Mar 1985), which SDAPCD's Regional Air Quality Strategy (RAQS) emissions forecast is based on. The project was deemed to be consistent with 2016 RAQS, which is the current air quality plan, because the most recent forecasts of the San Diego Association of Governments (SANDAG) anticipate growth for the project area of 199 new residents over a period of 8 years (2012 to 2020). The addition of approximately 199 new residents to Subregional Area 13 as a result of the project would be accommodated in the population forecast used to prepare the 2016 RAQS.

Construction Criteria Air Pollutant Emissions

Construction of the project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and VOC off-gassing) and off-site sources (i.e., on-road haul trucks, vendor trucks, and worker vehicle trips). Estimated maximum daily construction emissions would not exceed the SDAPCD significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ during construction in all construction years (2020–2022). Therefore, project construction impacts would be less than significant.

Operational Criteria Air Pollutant Emissions

Operational year 2023 was assumed, consistent with the construction schedule. Operation of the project would generate operational criteria air pollutants from mobile sources (i.e., vehicle trips), area sources (i.e., consumer product use, architectural coatings, and landscape maintenance equipment), and energy (i.e., natural gas). Estimated maximum daily operational emissions would not exceed the SDAPCD operational significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$. Therefore, project operational impacts would be less than significant.

Exposure of Sensitive Receptors

Carbon Monoxide Hotspots

Operation of the project would not expose sensitive receptors to localized high concentrations of CO or contribute traffic volumes to intersections that would cause a CO hotspot. As neither the 1-hour nor the 8-hour CO California Ambient Air Quality Standards (CAAQS) would be equaled or exceeded at any of the studied intersections, potential operational CO hotspot impacts would be less than significant.

Toxic Air Contaminants

Construction activities would not generate emissions in excess of the SDAPCD mass daily thresholds; therefore, project-generated construction emissions are not anticipated to be substantial. Diesel equipment used during project construction would be subject to the California Air Resources Board (CARB) air toxic control measures for in-use off-road diesel fleets, which would minimize diesel particulate matter (DPM) emissions.

No long-term sources of toxic air contaminant (TAC) emissions are anticipated during operation of the project because the project would only include residential units, recreational land uses, and commercial land uses; the project would not include heavy industrial uses or other land uses typically associated with stationary sources and TACs. Additionally, the project would not be located next to a major source of TACs or high-volume roadway. As such, the project would not result in substantial TAC emissions that may affect nearby receptors, nor would the project be exposed to nearby sources of TACs. Impact would be less than significant.

Odors

Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application, which would disperse rapidly from the project site and generally occur at magnitudes that would not affect substantial numbers of people. Impacts associated with odors during construction

would be less than significant. The project is a hotel/resort development that would not include land uses with sources that have the potential to generate substantial odors, and impacts associated with odors during construction and operation would be less than significant.

Cumulative Impacts

The potential for the project to result in a cumulatively considerable impact, per the SDAPCD guidance and thresholds, is based on the project's potential to exceed the project-specific daily thresholds. As discussed previously, maximum construction and operational emissions would not exceed the SDAPCD significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$. Therefore, the project would not result in a cumulatively considerable increase in criteria air pollutants.

Greenhouse Gas Emissions

Global climate change is primarily considered a cumulative impact, but must also be evaluated on a project-level under CEQA. A project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHG emissions. GHGs are gases that absorb infrared radiation in the atmosphere. Principal GHGs regulated under state and federal law and regulations include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). GHG emissions are measured in metric tons of CO_2 equivalent (MT CO_2e), which account for weighted global warming potential factors for CH_4 and N_2O.

Project-Generated Construction and Operational Greenhouse Gas Emissions

The threshold applied to assess the potential for the project to generate GHG emissions either directly or indirectly that may have a significant impact on the environment was generated by the local and statewide long-term GHG reduction goals. Pursuant to the South Coast Air Quality Management District (SCAQMD) recommendation, construction emissions were amortized over a 30-year project lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies (SCAQMD 2008).

This analysis developed a City-specific efficiency metric threshold to determine significance of project-generated GHG emissions, which is expressed as MT CO_2e per service population per year. A project's "service population" refers to a project's residents plus employees that would be generated by the project. An efficiency metric is calculated by dividing the allowable GHG emissions inventory in a selected calendar year by the service population (residents plus employees), which then leads to the identification of a quantity of emissions that can be permitted on a per service population basis without significantly impacting the environment. This approach is appropriate for the project because it measures the project's emissions on a per service population basis to determine its overall GHG efficiency relative to regulatory GHG reduction goals.

Because there are no GHG emissions, employment, or population data specific to the project's build-out year of 2023, an efficiency metric threshold was generated for 2023 by interpolating the efficiency metrics for 2020 and 2035. The efficiency metric was calculated two ways—based on the City's Climate Action Plan (CAP) projections, and based on statewide GHG emission reductions targets—and the more stringent of the two calculated thresholds was applied in the analysis. First, for the CAP-based efficiency metric, the City's CAP emission reduction targets for 2020 and 2035 were used to calculate a linear trend line and emissions targets for each interim year. Second, to generate the statewide consistency threshold, the 2020 baseline interpolated to the project's build-out year, using the 5.2% rate of average annual decline identified by CARB as necessary to achieve the 2030 reduction target (40% below 1990 levels) set out in Senate Bill (SB) 32 and the 2050 reduction target (80% below 1990 levels) established in Executive Order (EO) S-3-05 (CARB 2015b). To develop a service population, SANDAG Series 13 Regional Growth Forecast was used to estimate employment, consistent with the residential population projections in the CAP. An emissions level per service population per year was generated by dividing the interpolated emissions by the corresponding forecasted service population. The calculated efficiency metric for 2023 based on the CARB Scoping Plan projected emissions trajectory was 4.48 MT per service population per year, which is more stringent than the CAP-based efficiency metric of 4.83 MT per service population per year; therefore, the former was applied to evaluate the significance of project-generated GHG emissions.

Construction of the project would result in GHG emissions primarily associated with use of off-road construction equipment, on-road hauling and vendor (i.e., material delivery) trucks, and worker vehicles. Total project-generated GHG emissions during construction were estimated to be 1,712 MT CO_2e over the construction period. Additionally, the project would disturb 15.55 acres and grade a total of 14.86 acres, with varying carbon content values, and would remove 53 trees, resulting in a sequestered carbon loss of 59 MT CO_2e. Estimated project-generated construction emissions plus the loss of sequestered carbon amortized over 30 years would be approximately 59 MT CO_2e per year.

The project would generate operational GHG emissions from area sources (e.g., landscape maintenance), energy sources (e.g., natural gas and electricity), mobile sources, solid waste, and water supply and wastewater treatment. Estimated annual project-generated operational GHG emissions would be approximately 3,011 MT CO_2e per year. Additionally, the project would plant 77 trees, resulting in a carbon sequestration offset of 55 MT CO_2e over the project lifetime, resulting in approximately 2 MT CO_2e of sequestration annually over 30 years. Estimated total annual project-generated operational emissions in 2023 and amortized project construction emissions would be approximately 3,068 MT CO_2e per year.

The project is anticipated to entail 353 employees, 146 full-time residents of the villas, 8 residents of the single-family housing units, 45 residents of the affordable housing, and 135 hotel guests, resulting in a service population of 687 people. Estimated annual GHG emissions of 3,068 MT CO_2e per year divided by a service population of 687 people is 4.47 MT CO_2e per service population per year. As such, annual operational GHG emissions with amortized construction emissions would not exceed the 2023 interpolated threshold of 4.48 MT CO_2e per service population per year. Therefore, the project-generated GHG emissions would result in a less than significant impact.

Consistency with Applicable Greenhouse Gas Reduction Plans

The City adopted a CAP in 2016. The CAP is not qualified under CEQA Section 15183.5, and is focused on City actions that could reduce GHG emissions and help the City meet its 2030 GHG reduction targets. Although the CAP does not include specific implementation actions for private development actions, the project is consistent with the objectives of the CAP goals to the extent the goals are applicable to the project. Additionally, the project would not interfere with the City's implementation of the CAP's goals; therefore, this impact would be less than significant. The project is also consistent with applicable policy objectives and strategies from SANDAG's San Diego Forward: The Regional Plan (SANDAG 2015). In addition, the project would not interfere with implementation of the GHG reduction goals for 2030 or 2050 as established in EO S-3-05 and SB 32. Accordingly, the project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, and thus impacts would be less than significant.

1 INTRODUCTION

1.1 Report Purpose and Scope

The purpose of this report is to evaluate the potential air quality and greenhouse gas (GHG) emissions impacts associated with implementation of the Del Mar Beach Resort (project) located within the City of Del Mar (City). This assessment uses the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), and is based on the emissions-based significance thresholds recommended by the San Diego Air Pollution Control District (SDAPCD) and other applicable thresholds of significance.

This introductory section provides a description of the project and the project location. Section 2, Air Quality, describes the air quality-related environmental setting, regulatory setting, existing air quality conditions, and thresholds of significance and analysis methodology. Section 2 also presents an air quality impact analysis, per Appendix G of the CEQA Guidelines. Section 3, Greenhouse Gas Emissions, follows the same format as Section 2 and similarly describes the GHG emissions-related environmental setting, regulatory setting, existing climate change conditions, and thresholds of significance and analysis methodology. Similarly, Section 3 also presents a GHG emissions impact analysis per Appendix G of the CEQA Guidelines. Section 4, References Cited, includes a list of the references cited. Section 5, List of Preparers, includes a list of those who prepared this technical report.

1.2 Project Location

The project site includes approximately 17.45 acres of land located south of Border Avenue and west of Camino Del Mar, as well as a portion east of Camino Del Mar, in the northwestern corner of the City of Del Mar (see Figure 1). The Plan Area is comprised of 16.55 acres of privately owned land, 0.78 acres of public right-of-way along Camino Del Mar, and a 0.12-acre City coastal viewing access parcel located at the northern extent of the Plan Area. The site comprises eight parcels, seven of which are vacant including Assessor's Parcel Numbers 298-241-06, 07, 29, 34, 35, 36, and 299-030-14 and 15. A one-story, 5,800 square foot residence (with accessory garage structure and pool cabana building) is located on the most southern parcel of the project site (Assessor's Parcel Number: 299-030-15-00).

Additional land that may be included in the project area includes the City of Del Mar North Bluff Preserve (Assessor's Parcel Number: 299-030-07), Camino del Mar public right-of-way easterly and adjacent to the site, portions of North Beach, and a City coastal viewing access easement (Assessor's Parcel Number: 298-241-18) located at the northern extent of the project site (see Figure 2).

1.3 Project Description

The project consists of a Specific Plan including five land use sub-designations: Visitor Serving Accommodations (VSA), Parkland/Passive Open Space (PPOS), Coastal Bluff Protection Area (CBPA) and Steep Slope Protection Area (SSPA). The VSA land use sub-designation allows for the development of approximately 65 hotel guest rooms, 31 villas (some of which may be used as hotel guest rooms when not in use by owners, subject to provisions in the Specific Plan), 10 lower-cost shared visitor-serving accommodations, 22 affordable housing units, and associated amenities. Amenities include, but are not limited to, restaurants, bar/lounge, special event space, meeting space, swimming pools, a spa and fitness center and retail.

The PPOS land use sub-designation allows for public amenities such as trails, vista points, picnic areas, public access stairway and public restrooms, and passive recreational uses. Passive recreational uses are defined in the Specific plan as low intensity recreational activities that require little or no infrastructure and that are geared toward the viewing and appreciation of scenic and environmentally sensitive areas.

The CBPA and SSPA land use sub-designations serve as protection areas. The only disturbance allowed within the CBPA is the minimal amount necessary to install drainage control measures to protect a coastal bluff area from degradation and/or erosion. Shoreline protection devices are prohibited in this area. The only disturbance allowed within the SSPA is the minimal amount necessary to provide a public access stairway, public restrooms, and related facilities for hotel and public visitor services at the toe of slope; to implement drainage control measures to protect the steep slope area from degradation and/or erosion; and to allow interpretive signage and pathway lighting.

Off-site improvements include a new potable water main for the project to extend into the City in order to find a suitable connection point. The existing water mains servicing the northernmost houses before the entrance to the lagoon are currently served by either an existing 4-inch or 6-inch water main, which would not have sufficient capacity to serve as the connection point for the new water main. Two alternatives for the proposed water main are being analyzed. Both alternatives consist of constructing a new 16-inch diameter pipeline. One alternative is to construct approximately 4,500 linear feet of new 16-inch water main in Via de la Valle from the intersection of Via de la Valle San Dieguito Drive and Jimmy Durante Boulevard to via 28th Street and Camino Del Mar within the City. The second alternative would construct approximately 5,000 linear feet of 16-inch pipe connected to an existing 20-inch City of Del Mar pipeline beginning on the west side of the intersection of Jimmy Durante Boulevard and San Dieguito Drive. This pipeline would extend northwest, following the Public Works Yard paved access road, then go along the dirt access road adjacent to the Public Works Yard up to the proposed crossing of the railroad right-of-way and drainage ditch. The work to cross the railroad right-of-way and drainage ditch would be done using a jack-and-bore construction method to avoid interruption of these resources. Then the pipeline would

continue west via 27th or 28th Street to Camino Del Mar, then north to Via De La Valle. This alternative would replace existing pipelines south of Sandy Lane and construct new pipelines north of Sandy Lane to Via de la Valle. All pipeline construction and replacement would occur within paved roads, City and North County Transit District right-of-way, or the Public Works yard.

1.4 Project Design Features

The following Project Design Features (PDFs) shall be included in the project:

PDF-AQ-1 **Architectural Coating Limits**. The project shall comply with the following volatile organic compound (VOC) content limits for architectural coatings for residential and non-residential and uses: 50 grams per liter VOC for interior surfaces and 100 grams per liter VOC for exterior coatings.

PDF-AQ-2 **Facilitate Use of Electrical Lawn and Garden Equipment**. Prior to the issuance of residential building permits, the applicant or its designee shall provide evidence to the County of San Diego that building design plans require that residential structures be equipped with outdoor electric outlets in the front and rear of the structure to facilitate use of electrical lawn and garden equipment.

PDF-AQ/GHG-1 **Wood Burning Stoves and Fireplaces**. Prior to the issuance of building permits, the project applicant or its designee shall submit building plans illustrating that no wood burning stoves or fireplaces would be constructed.

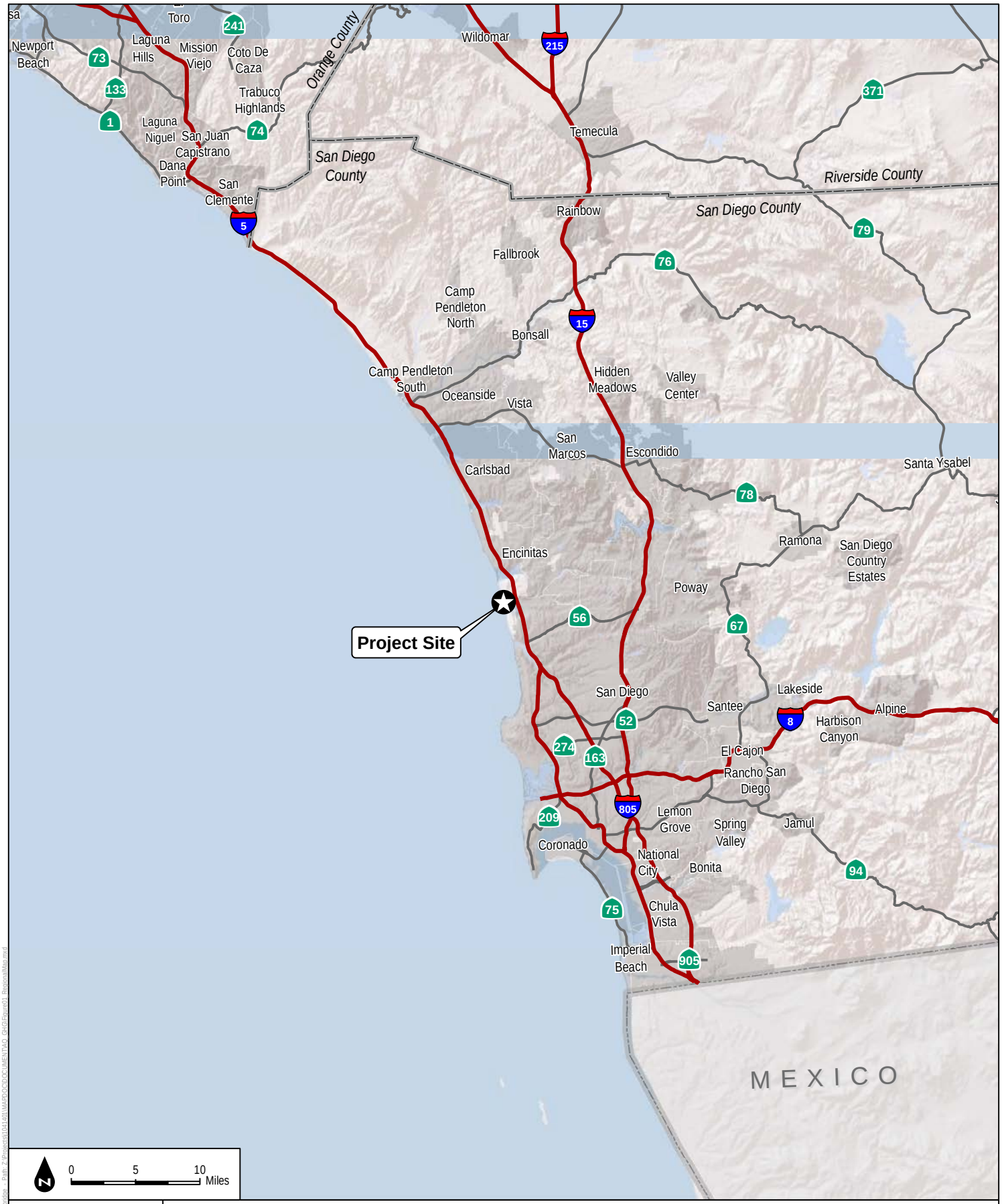
PDF-AQ/GHG-2 **Photovoltaic Generation**. Prior to the issuance of building permits, the project applicant or its designee shall submit building plans illustrating that the project will install photovoltaic systems, which would generate 45% of project-wide energy demand.

PDF-AQ/GHG-3 **Green Power Purchase (Electricity)**. Prior to the issuance of certificates of occupancy, the project applicant shall demonstrate that the project has an agreement in place to purchase at minimum 75% green power (electricity) from the City's or equivalent Community Choice Aggregate program to offset all remaining electricity demand from the project that is not provided by on-site solar power.

PDF-AQ/GHG-4 **Transportation Demand Management**. The following Transportation Demand Management (TDM) measures shall be implemented.

- Provide a Commute Transportation Information Display (e.g., bulletin board) to be placed in a common area that is accessible by all employees (e.g., employee lounge).
- Designate 8% of total parking as designated for low emitting, or fuel-efficient and carpool/van pool vehicles
- Provide short-term and long-term bicycle parking spaces consisting of convenient and secure, permanently anchored bicycle racks.
- Provide a free shuttle service for employees from the Solana Beach train station.
- Provide an airport/train station shuttle service for guests on an "on-demand" basis. Pickups/drop-offs to and from the airport and train station will be made via the hotel's website when booking, via phone, or in person with the hotel's front desk.
- Provide employees with 511 San Diego Compass Card—compatible with use on Metropolitan Transit System Bus, Rapid, Rapid Express, Trolley, and North County Transit District Breeze, Coaster, or Sprinter transit services—on which fares can be stored.
- Offer employees the value of one month's transit fare (i.e., up to the value of a 511 San Diego Compass Card 30-day pass) to be provided on an employee's existing Compass Card (for one month per employee).
- Provide free shuttle services for employees from the Solana Beach Coaster station.
- Provide alternate work schedules, including housekeeping, customer service, and restaurant employees.
- Provide 1% of the parking spaces to be equipped with electric vehicle charging equipment and an additional 1% of total parking as 'Electric Vehicle Capable'.

To ensure that the TDM Program strategies are implemented and effective, a resort employee would be designated transportation coordinator (likely as part of an Human Resource personnel role) would be established to monitor the TDM Program, and would be responsible for developing, marketing, implementing, and evaluating the TDM Program.



SOURCE: ESRI 2017

FIGURE 1

Regional Map

DUDEK

Del Mar Resort Air Quality and Greenhouse Gas Emissions Analysis Technical Report

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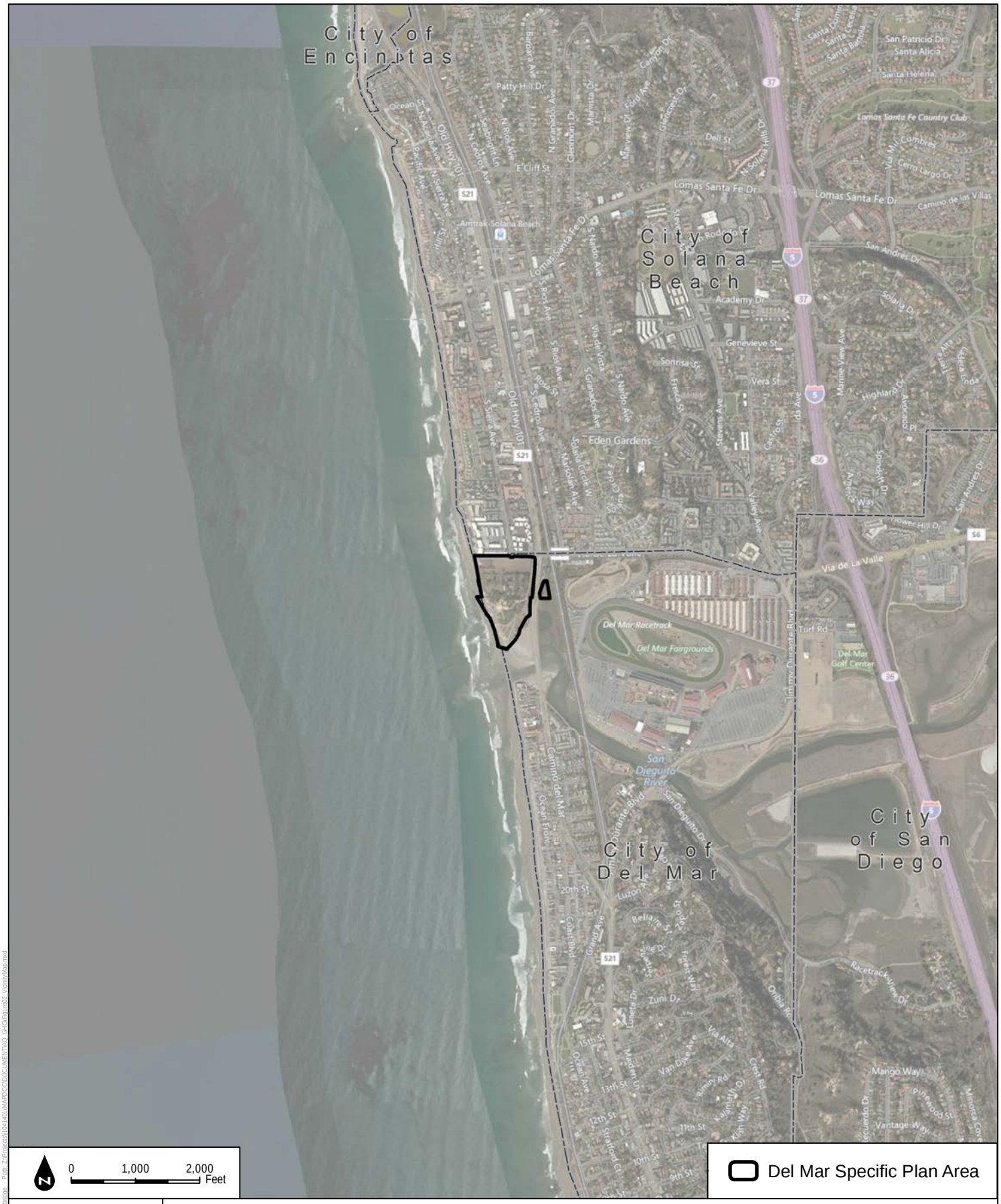

SOURCE: Bing Maps 2018

FIGURE 2

Vicinity Map

DUDEK

Del Mar Resort Air Quality and Greenhouse Gas Emissions Analysis Technical Report

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2 AIR QUALITY

2.1 Environmental Setting

The project site is located within the San Diego Air Basin (SDAB or basin) and is subject to SDAPCD guidelines and regulations. The SDAB is one of 15 air basins that geographically divide the State of California. The SDAB comprises the entire San Diego region and covers approximately 4,260 square miles.

2.1.1 Climate, Meteorological, and Topographical Conditions

The primary factors that determine air quality are the locations of air pollutant sources and the amount of pollutants emitted. Meteorological and topographical conditions, however, are also important. Factors such as wind speed and direction, air temperature gradients and sunlight, and precipitation and humidity interact with physical landscape features to determine the movement and dispersal of air pollutants. Meteorological and topographical factors that affect air quality in the SDAB are described below.[1]

Regional Climate and Meteorological Conditions

The climate of the San Diego region, as in most of Southern California, is influenced by the strength and position of the semi-permanent high-pressure system over the Pacific Ocean, known as the Pacific High. This high-pressure ridge over the West Coast often creates a pattern of late-night and early-morning low clouds, hazy afternoon sunshine, daytime onshore breezes, and little temperature variation year-round. The SDAB is characterized as a Mediterranean climate with dry, warm summers and mild, occasionally wet winters. Average temperature ranges (in degrees Fahrenheit (°F)) from the mid-40s to the high 90s, with an average of 201 days warmer than 70°F. The SDAB experiences 9 to 13 inches of rainfall annually, with most of the region's precipitation falling from November through March, and infrequent (approximately 10%) precipitation during the summer. El Niño and La Niña patterns have significant effects on the annual rainfall received in San Diego, where San Diego receives less than normal rainfall during La Niña years.

The interaction of ocean, land, and the Pacific High maintains clear skies for much of the year and influences the direction of prevailing winds (westerly to northwesterly). The winds tend to blow onshore in the day and offshore at night. Local terrain is often the dominant factor inland, and

[1] The discussion of meteorological and topographical conditions of the SDAB is based on information provided in the SDAPCD *2016 Monitoring Plan* (SDAPCD 2017a), the County of San Diego *Guidelines for Determining Significance – Air Quality* (County of San Diego 2007), the County of San Diego *General Plan Update EIR* (County of San Diego 2011), and the CARB *Recommended Area Designation for the 2010 Federal Sulfur Dioxide Standard* (CARB 2011a).

winds in inland mountainous areas tend to blow through the valleys during the day and down the hills and valleys at night.

The favorable climate of San Diego also works to create air pollution problems. Sinking, or subsiding air from the Pacific High, creates a temperature inversion known as a subsidence inversion, which acts as a "lid" to vertical dispersion of pollutants. Weak summertime pressure gradients further limit horizontal dispersion of pollutants in the mixed layer below the subsidence inversion. Poorly dispersed anthropogenic emissions combined with strong sunshine leads to photochemical reactions that result in the creation of ozone (O_3) at this surface layer. In addition, light winds during the summer further limit ventilation.

In the fall months, the SDAB is often impacted by Santa Ana winds, which are the result of a high-pressure system over the Nevada and Utah regions that overcomes the westerly wind pattern and forces hot, dry winds from the east to the Pacific Ocean. The Santa Ana winds are powerful and can blow the SDAB's pollutants out to sea. However, a weak Santa Ana can transport air pollution from the South Coast Air Basin, located north of the SDAB, and greatly increase O_3 concentrations in the San Diego area.

Under certain conditions, atmospheric oscillation results in the offshore transport of air from the Los Angeles region to San Diego County (County). This often produces high O_3 concentrations, as measured at air pollutant monitoring stations within the County. The transport of air pollutants from Los Angeles to San Diego can also occur within the stable layer of the elevated subsidence inversion, where high levels of O_3 are transported.

Site-Specific Meteorological Conditions

The local climate in the San Diego region is characterized as semi-arid with consistently mild, warmer temperatures throughout the year. The average summertime high temperature in the region is approximately 80°F. The average wintertime low temperature is approximately 45°F. Average precipitation in the local area is approximately 10 inches per year, with the bulk of precipitation falling between December and March (WRCC 2009).

Topographical Conditions

Topography in the San Diego region varies greatly, from beaches in the west to mountains and desert in the east; much of the topography in between consists of mesa tops intersected by canyon areas. Along with local meteorology, topography influences the dispersal and movement of pollutants in the SDAB. Mountains to the east prohibit dispersal of pollutants in that direction and help trap pollutants in inversion layers.

The topography of the SDAB also drives pollutant levels, and the SDAB is classified as a "transport recipient," whereby pollutants are transported from the South Coast Air Basin to the north and, when the wind shifts direction, from Tijuana, Mexico, to the south.

2.1.2 Pollutants and Effects

2.1.2.1 Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The national and California standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include O_3, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and lead. These pollutants, as well as toxic air contaminants (TACs), are discussed in the following paragraphs.[2] In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric O_3) and at the Earth's surface in the troposphere (ground-level O_3).[3] The O_3 that the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" O_3. Stratospheric, or "good," O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

[2] The descriptions of each of the criteria air pollutants and associated health effects are based on the U.S. Environmental Protection Agency's (EPA's) Criteria Air Pollutants (EPA 2018a) and the California Air Resources Board's (CARB's) Glossary of Air Pollutant Terms (CARB 2019a).

[3] The troposphere is the layer of the Earth's atmosphere nearest to the surface of the Earth. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2013). These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

Inhalation of O_3 causes inflammation and irritation of the tissues lining human airways, causing and worsening a variety of symptoms. Exposure to O_3 can reduce the volume of air that the lungs breathe in and cause shortness of breath. O_3 in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. The occurrence and severity of health effects from O_3 exposure vary widely among individuals, even when the dose and the duration of exposure are the same. Research shows adults and children who spend more time outdoors participating in vigorous physical activities are at greater risk from the harmful health effects of O_3 exposure. While there are relatively few studies of O_3's effects on children, the available studies show that children are no more or less likely to suffer harmful effects than adults. However, there are a number of reasons why children may be more susceptible to O_3 and other pollutants. Children and teens spend nearly twice as much time outdoors and engaged in vigorous activities as adults. Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults. Also, children are less likely than adults to notice their own symptoms and avoid harmful exposures. Further research may be able to better distinguish between health effects in children and adults. Children, adolescents and adults who exercise or work outdoors, where O_3 concentrations are the highest, are at the greatest risk of harm from this pollutant (CARB 2019b).

Nitrogen Dioxide and Oxides of Nitrogen. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources (such as electric utility and industrial boilers).

A large body of health science literature indicates that exposure to NO_2 can induce adverse health effects. The strongest health evidence, and the health basis for the ambient air quality standards (AAQS) for NO_2, results from controlled human exposure studies that show that NO_2 exposure can intensify responses to allergens in allergic asthmatics. In addition, a number of epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses. Infants and children are particularly at risk because they have disproportionately higher exposure to NO_2 than adults due to their greater breathing rate for their body weight and their typically greater outdoor exposure

duration. Several studies have shown that long-term NO_2 exposure during childhood, the period of rapid lung growth, can lead to smaller lungs at maturity in children with higher levels of exposure compared to children with lower exposure levels. In addition, children with asthma have a greater degree of airway responsiveness compared with adult asthmatics. In adults, the greatest risk is to people who have chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease (CARB 2019c).

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

CO is harmful because it binds to hemoglobin in the blood, reducing the ability of blood to carry oxygen. This interferes with oxygen delivery to the body's organs. The most common effects of CO exposure are fatigue, headaches, confusion and reduced mental alertness, light-headedness, and dizziness due to inadequate oxygen delivery to the brain. For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress. Inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance. Unborn babies whose mothers experience high levels of CO exposure during pregnancy are at risk of adverse developmental effects. Unborn babies, infants, elderly people, and people with anemia or with a history of heart or respiratory disease are most likely to experience health effects with exposure to elevated levels of CO (CARB 2019d).

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

Controlled human exposure and epidemiological studies show that children and adults with asthma are more likely to experience adverse responses with SO_2 exposure, compared with the non-asthmatic population. Effects at levels near the 1-hour standard are those of asthma exacerbation, including bronchoconstriction accompanied by symptoms of respiratory irritation such as wheezing, shortness

of breath, and chest tightness, especially during exercise or physical activity. Also, exposure at elevated levels of SO_2 (above 1 parts per million [ppm]) results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality. The elderly and people with cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most likely to experience these adverse effects (CARB 2019e).

SO_2 is of concern both because it is a direct respiratory irritant and because it contributes to the formation of sulfate and sulfuric acid in particulate matter (NRC 2005). People with asthma are of particular concern, both because they have increased baseline airflow resistance and because their SO_2-induced increase in airflow resistance is greater than in healthy people, and it increases with the severity of their asthma (NRC 2005). SO_2 is thought to induce airway constriction via neural reflexes involving irritant receptors in the airways (NRC 2005).

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Coarse particulate matter (PM_{10}) consists of particulate matter that is 10 microns or less in diameter and is about 1/7 the diameter of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) consists of particulate matter that is 2.5 microns or less in diameter and is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_x, NO_x, and VOCs.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also produce haze and reduce regional visibility and damage and discolor surfaces on which they settle.

A number of adverse health effects have been associated with exposure to both $PM_{2.5}$ and PM_{10}. For $PM_{2.5}$, short-term exposures (up to 24-hour duration) have been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis,

asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days. These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases. In addition, of all of the common air pollutants, $PM_{2.5}$ is associated with the greatest proportion of adverse health effects related to air pollution, both in the United States and worldwide based on the World Health Organization's Global Burden of Disease Project. Short-term exposures to PM_{10} have been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease, leading to hospitalization and emergency department visits (CARB 2017a).

Long-term exposure (months to years) to $PM_{2.5}$ has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children. The effects of long-term exposure to PM_{10} are less clear, although several studies suggest a link between long-term PM_{10} exposure and respiratory mortality. The International Agency for Research on Cancer published a review in 2015 that concluded that particulate matter in outdoor air pollution causes lung cancer (CARB 2017a).

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth.

Sulfates. Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO_2 in the atmosphere and can result in respiratory impairment, as well as reduced visibility.

Vinyl Chloride. Vinyl chloride is a colorless gas with a mild, sweet odor, which has been detected near landfills, sewage plants, and hazardous waste sites, due to the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air can cause nervous

system effects, such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation can cause liver damage, including liver cancer.

Hydrogen Sulfide. Hydrogen sulfide is a colorless and flammable gas that has a characteristic odor of rotten eggs. Sources of hydrogen sulfide include geothermal power plants, petroleum refineries, sewers, and sewage treatment plants. Exposure to hydrogen sulfide can result in nuisance odors, as well as headaches and breathing difficulties at higher concentrations.

Visibility-Reducing Particles. Visibility-reducing particles are any particles in the air that obstruct the range of visibility. Effects of reduced visibility can include obscuring the viewshed of natural scenery, reducing airport safety, and discouraging tourism. Sources of visibility-reducing particles are the same as for $PM_{2.5}$ described above.

Volatile Organic Compounds. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as VOCs (also referred to as reactive organic gases). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the primary sources of hydrocarbons. Other sources include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of VOCs result from the formation of O_3 and its related health effects. High levels of VOCs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic (i.e., cancer-causing) forms of hydrocarbons, such as benzene, are considered toxic air contaminants (TACs). There are no separate health standards for VOCs as a group.

2.1.2.2 Non-Criteria Air Pollutants

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic noncancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics "Hot Spots" Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location

of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources, such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources, such as automobiles; and area sources, such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC.

Diesel Particulate Matter. Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair), and thus is a subset of $PM_{2.5}$. DPM is typically composed of carbon particles ("soot," also called black carbon, or BC) and numerous organic compounds, including over 40 known cancer-causing organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. The CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM; 17 CCR 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000). Because it is part of $PM_{2.5}$, DPM also contributes to the same non-cancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies. Those most vulnerable to non-cancer health effects are children whose lungs are still developing and the elderly who often have chronic health problems.

Odorous Compounds. Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. For instance, an odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the

intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

2.1.3 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005).

The nearest existing sensitive receptors are located adjacent to the project site's northern boundary. Receptors also include visitors and residents of the project.

2.2 Regulatory Setting

2.2.1 Federal Regulations

2.2.1.1 Criteria Air Pollutants

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the Clean Air Act, including setting National Ambient Air Quality Standards (NAAQS) for major air pollutants; setting hazardous air pollutants (HAPs) standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O_3 protection measures, and enforcement provisions. Under the Clean Air Act, NAAQS are established for the following criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan (SIP) that demonstrates how those areas will attain the standards within mandated time frames.

2.2.1.2 Hazardous Air Pollutants

The 1977 federal Clean Air Act amendments required the EPA to identify National Emission Standards for Hazardous Air Pollutants to protect public health and welfare. HAPs include certain VOCs, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 Clean Air Act amendments, which expanded the control program for HAPs, 187 substances and chemical families were identified as HAPs.

2.2.2 State Regulations

2.2.2.1 Criteria Air Pollutants

The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. The CAAQS describe adverse conditions; that is, pollution levels must be below these standards before a basin can attain the standard. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and $PM_{2.5}$ and visibility-reducing particles are values not to be exceeded. All others are not to be equaled or exceeded. The NAAQS and CAAQS are presented in Table 1.

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary[c,d]*	*Secondary[c,e]*
O_3	1 hour	0.09 ppm (180 μg/m³)	—	Same as Primary Standard[f]
	8 hours	0.070 ppm (137 μg/m³)	0.070 ppm (137 μg/m³)[f]	
NO_2[g]	1 hour	0.18 ppm (339 μg/m³)	0.100 ppm (188 μg/m³)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 μg/m³)	0.053 ppm (100 μg/m³)	
CO	1 hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	None
	8 hours	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	
SO_2[h]	1 hour	0.25 ppm (655 μg/m³)	0.075 ppm (196 μg/m³)	—

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
	3 hours	—	—	0.5 ppm (1,300 µg/m³)
	24 hours	0.04 ppm (105 µg/m³)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}[i]	24 hours	50 µg/m³	150 µg/m³	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m³	—	
$PM_{2.5}$[i]	24 hours	—	35 µg/m³	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m³	12 µg/m³	15 µg/m³
Lead[j,k]	30-day Average	1.5 µg/m³	—	—
	Calendar Quarter	—	1.5 µg/m³ (for certain areas)[k]	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 µg/m³	
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m³)	—	—
Vinyl chloride[j]	24 hours	0.01 ppm (26 µg/m³)	—	—
Sulfates	24 hours	25 µg/m³	—	—
Visibility reducing particles	8 hours (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to the number of particles when the relative humidity is less than 70%	—	—

Source: CARB 2016.

Notes: µg/m³ = micrograms per cubic meter; mg/m³= milligrams per cubic meter; ppm = parts per million by volume; O_3 = ozone; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns.

a California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, suspended particulate matter (PM_{10}, $PM_{2.5}$), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once per year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

d National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[e] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] On October 1, 2015, the national 8-hour O_3 primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[g] To attain the national 1-hour standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

[h] On June 2, 2010, a new 1-hour SO_2 standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the national 1-hour standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 $\mu g/m^3$ to 12 $\mu g/m^3$. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM_{10} standards (primary and secondary) of 150 $\mu g/m^3$ were also retained. The form of the annual primary and secondary standards is the annual mean averaged over 3 years.

[j] CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

2.2.2.2 Toxic Air Contaminants

The state Air Toxics Program was established in 1983 under AB 1807 (Tanner). The California TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) HAPs. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate air toxics emissions. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000 (CARB 2000). Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment Program. All of these regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel powered equipment. Several Airborne Toxic Control Measures that reduce diesel emissions including in-use off-road diesel-fueled fleets (13 CCR 2449 et seq.) and in-use on-road diesel-fueled vehicles (13 CCR 2025).

California Health and Safety Code Section 41700

Section 41700 of the Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

2.2.3 Local Regulations

2.2.3.1 San Diego Air Pollution Control District

CARB is responsible for the regulation of mobile emission sources within the state, and local air quality management districts and air pollution control districts are responsible for enforcing standards and regulating stationary sources. The project site is located within the SDAB and is subject to the guidelines and regulations of the SDAPCD.

In San Diego County, O_3 and particulate matter are the pollutants of main concern, since the County exceeds state ambient air quality standards for those pollutants most years. For this reason, the SDAB has been designated as a nonattainment area for the state PM_{10}, $PM_{2.5}$, and O_3 standards. The SDAB is also a federal O_3 attainment (maintenance) area for 1997 8-hour O_3 standard, an O_3 nonattainment area for the 2008 8-hour O_3 standard, and a CO maintenance area (western and central part of the SDAB only, including the project area).

Federal Attainment Plans

In December 2016, the SDAPCD adopted an update to the Eight-Hour Ozone Attainment Plan for San Diego County (2008 O_3 NAAQS). The 2016 Eight-Hour Ozone Attainment Plan for San Diego County indicates that local controls and state programs would allow the region to reach attainment of the federal 8-hour O_3 standard (1997 O_3 NAAQS) by 2018 (SDAPCD 2016a). In this plan, SDAPCD relies on the Regional Air Quality Strategy (RAQS) to demonstrate how the region will comply with the federal O_3 standard. The RAQS details how the region will manage and reduce O_3 precursors (NO_x and VOCs) by identifying measures and regulations intended to reduce these pollutants. The control measures identified in the RAQS generally focus on stationary sources; however, the emissions inventories and projections in the RAQS address all potential sources, including those under the authority of CARB and the EPA. Incentive programs for reduction of emissions from heavy-duty diesel vehicles, off-road equipment, and school buses are also established in the RAQS.

Currently, the County is designated as moderate nonattainment for the 2008 NAAQS and maintenance for the 1997 NAAQS. As documented in the 2016 Eight-Hour Ozone Attainment Plan for San Diego County, the County has a likely chance of obtaining attainment due to the transition to low emission cars, stricter new source review rules, and continuing the requirement of general conformity for military growth and the San Diego International Airport. The County will also continue emission control measures including ongoing implementation of existing regulations in ozone precursor reduction to stationary and area-wide sources, subsequent inspections of facilities and sources, and the adoption of laws requiring Best Available Retrofit Control Technology for control of emissions (SDAPCD 2016a).

State Attainment Plans

The SDAPCD and The 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 RAQS for the SDAB was initially adopted in 1991 and is updated on a triennial basis, most recently in 2016 (SDAPCD 2016a). The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O_3. The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in San Diego County and the cities in the County, to forecast future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by San Diego County and the cities in the County as part of the development of their general plans (SANDAG 2017a, 2017b).

In December 2016, the SDAPCD adopted the revised RAQS for the County. Since 2007, the San Diego region reduced daily VOC emissions and NO_x emissions by 3.9% and 7.0% respectively; the SDAPCD expects to continue reductions through 2035 (SDAPCD 2016a). These reductions were achieved through implementation of six VOC control measures and three NO_x control measures adopted in the SDAPCD's 2009 RAQS (SDAPCD 2009). The SDAPCD is also considering additional measures, including three VOC measures and four control measures to reduce 0.3 daily tons of VOC and 1.2 daily tons of NO_x, provided they are found to be feasible region-wide. In addition, SDAPCD has implemented nine incentive-based programs, has worked with SANDAG to implement regional transportation control measures, and has reaffirmed the state emission offset repeal.

In regards to particulate matter emissions reduction efforts, in December 2005, the SDAPCD prepared a report titled "Measures to Reduce Particulate Matter in San Diego County" to address implementation of Senate Bill (SB) 656 in San Diego County (SB 656 required additional controls to reduce ambient concentrations of PM_{10} and $PM_{2.5}$) (SDAPCD 2005). In the report, SDAPCD

evaluated implementation of source-control measures that would reduce particulate matter emissions associated with residential wood combustion; various construction activities including earthmoving, demolition, and grading; bulk material storage and handling; carryout and track-out removal and cleanup methods; inactive disturbed land; disturbed open areas; unpaved parking lots/staging areas; unpaved roads; and windblown dust (SDAPCD 2005).

SDAPCD Rules and Regulations

As stated above, the SDAPCD is responsible for planning, implementing, and enforcing federal and state ambient standards in the SDAB. The following rules and regulations apply to all sources in the jurisdiction of SDAPCD, and would apply to the project:

- **SDAPCD Regulation II: Permits; Rule 20.2: New Source Review Non-Major Stationary Sources**. Requires new or modified stationary source units (that are not major stationary sources) with the potential to emit 10 pounds per day or more of VOC, NO_x, sulfur oxides (SO_x), or PM_{10} to be equipped with BACT. For those units with a potential to emit above Air Quality Impact Assessments Trigger Levels, the units must demonstrate that such emissions would not violate or interfere with the attainment of any national air quality standard (SDAPCD 1998).

  The Proposed Project does not propose specific stationary sources. If stationary sources were to be included as part of the Proposed Project, or at a later date, those sources would be subject to Rule 20.2 and would require appropriate operating permits from the SDAPCD. Because the SDAPCD has not adopted specific criteria air pollutant thresholds for analyses under the California Environmental Quality Act (CEQA), the thresholds identified in Rule 20.2 are used in this analysis as screening-level thresholds to evaluate project-level impacts, as discussed in Section 3.1.

- **SDAPCD Regulation IV: Prohibitions; Rule 50: Visible Emissions.** Prohibits discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than 3 minutes in any period of 60 consecutive minutes that is darker in shade than that designated as Number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or of such opacity as to obscure an observer's view to a degree greater than does smoke of a shade designated as Number 1 on the Ringelmann Chart (SDAPCD 1997).
- **SDAPCD Regulation IV: Prohibitions; Rule 51: Nuisance.** Prohibits the discharge, from any source, of such quantities of air contaminants or other materials that cause or have a tendency to cause injury, detriment, nuisance, annoyance to people and/or the public, or damage to any business or property (SDAPCD 1969).

- **SDAPCD Regulation IV: Prohibitions; Rule 55: Fugitive Dust.** Regulates fugitive dust emissions from any commercial construction or demolition activity capable of generating fugitive dust emissions, including active operations, open storage piles, and inactive disturbed areas, as well as track-out and carry-out onto paved roads beyond a project Site (SDAPCD 2009).
- **SDAPCD Regulation IV: Prohibitions; Rule 67.0.1: Architectural Coatings.** Requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories (SDAPCD 2015a).

- **SDAPCD Regulation XII: Toxic Air Contaminates; Rule 1200: Toxic Air Contaminants - New Source Review**. Requires new or modified stationary source units with the potential to emit TACs above rule threshold levels to either demonstrate that they will not increase the maximum incremental cancer risk above 1 in 1 million at every receptor location, or demonstrate that toxics best available control technology (T-BACT) will be employed if maximum incremental cancer risk is equal to or less than 10 in 1 million, or demonstrate compliance with SDAPCD's protocol for those sources with an increase in maximum incremental cancer risk at any receptor location of greater than 10 in 1 million but less than 100 in 1 million (SDAPCD 2017b).

  The Proposed Project does not propose specific stationary sources that would generate TACs that are not commonly associated with residential development projects. If stationary sources with the potential to emit TACs were to be included as part of the Proposed Project, or at a later date, those sources would be subject to SDAPCD Rule 1200, and would be subject to New Source Review requirements.

- **SDAPCD Regulation XII: Toxic Air Contaminates; Rule 1210: Toxic Air Contaminant Public Health Risks – Public Notification and Risk Reduction**. Requires each stationary source that is required to prepare a public risk assessment to provide written public notice of risks at or above the following levels: maximum incremental cancer risks equal to or greater than 10 in 1 million, or cancer burden equal to or greater than 1.0, or total acute noncancer health hazard index equal to or greater than 1.0, or total chronic noncancer health hazard index equal to or greater than 1.0 (SDAPCD 2017c).

  The Proposed Project does not propose specific stationary sources that would generate TACs. If stationary sources with the potential to emit TACs were to be included as part of the Proposed Project, or at a later date, those sources would be subject to SDAPCD Rule 1210, and would be subject to Public Notification and Risk Reduction requirements. The thresholds identified in Rule 1210 are used in this analysis as thresholds for the health risk assessment, which are consistent with the SDAPCD health risk assessment guidelines (SDAPCD 2015b).

2.2.3.2 San Diego Association of Governments

SANDAG is the regional planning agency for San Diego County and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SANDAG serves as the federally designated metropolitan planning organization (MPO) for San Diego County. With respect to air quality planning and other regional issues, SANDAG has prepared *San Diego Forward: The Regional Plan* (Regional Plan) for the San Diego region (SANDAG 2015). The Regional Plan combines the big-picture vision for how our region will grow over the next 35 years with an implementation program to help make that vision a reality. The Regional Plan, including its Sustainable Communities Strategy (SCS), 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 diverse needs of the San Diego region through 2050.

In regard to air quality, the Regional Plan sets the policy context in which SANDAG participates in and responds to SDAPCD's air quality plans and builds off the air district's air quality plan processes that are designed to meet health-based criteria pollutant standards in several ways (SANDAG 2015). First, it complements air quality plans by providing guidance and incentives for public agencies to consider best practices that support the technology-based control measures in air quality plans. Second, the Regional Plan emphasizes the need for better coordination of land use and transportation planning, which heavily influences the emissions inventory from the transportation sectors of the economy. This also minimizes land use conflicts, such as residential development near freeways, industrial areas, or other sources of air pollution.

On September 23, 2016, SANDAG's Board of Directors adopted the final *2016 Regional Transportation Improvement Program*. It is a multi-billion dollar, multi-year program of projects for major transportation projects in the San Diego region. Transportation projects supported through federal, state, and TransNet (the San Diego transportation sales tax program) funds must be included in an approved Regional Transportation Improvement Program. The programming of locally funded projects also may be programmed at the discretion of the agency. The 2016 Regional Transportation Improvement Program covers five fiscal years and incrementally implements the Regional Plan (SANDAG 2016).

2.2.3.3 City of Del Mar

The City of Del Mar General Plan includes policies related to improving air quality (both directly and indirectly) (City of Del Mar 1985). Applicable policies include the following:

Transportation Element

Goal 2. Objective F. Work to reduce transportation related sources of water pollution, particularly in storm water runoff.

Policy 1: Seek to promote the reduction of vehicle-miles-traveled, thereby reducing congestion and reducing air and water pollution.

Policy 2: Recognize and publicize the relationship between air pollution and water pollution in the deposition onto streets and other surfaces of airborne contaminants, including metals and fine particulate matter (PM_{10}).

Environmental Management Element

Goal 1. Objective H.

Policy 12: Encourage reductions and modifications to air pollution generating activities and sources to reduce the deposition of air-borne pollutants and improve urban and stormwater runoff water quality.

2.3 Regional and Local Air Quality Conditions

2.3.1 San Diego Air Basin Attainment Designation

Pursuant to the 1990 federal Clean Air Act Amendments, the EPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant, based on whether the NAAQS have been achieved. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as "attainment" for that pollutant. If an area exceeds the standard, the area is classified as "nonattainment" for that pollutant. As previously discussed, these standards are set by the EPA or CARB for the maximum level of a given air pollutant that can exist in the outdoor air without unacceptable effects on human health or the public welfare. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified" or "unclassifiable." The designation of "unclassifiable/attainment" means that the area meets the standard or is expected to be meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are redesignated as maintenance areas and must have approved Maintenance Plans to ensure continued attainment of the standards. The California Clean Air Act, like its federal counterpart, called for the designation of areas as "attainment" or "nonattainment," but based on CAAQS rather than the NAAQS. Table 2 summarizes the SDAB's federal and state attainment designations for each of the criteria pollutants.

Table 2
San Diego Air Basin Attainment Classification

Pollutant	National Designation	California Designation
O_3 (1-hour)	Attainment[a]	**Nonattainment**
O_3 (8-hour – 1997) (8-hour – 2008)	Attainment (Maintenance) **Nonattainment (Moderate)**	**Nonattainment**

Table 2
San Diego Air Basin Attainment Classification

Pollutant	National Designation	California Designation
NO_2	Unclassifiable/Attainment	Attainment
CO	Attainment (Maintenance)	Attainment
SO_2	Unclassifiable/Attainment	Attainment
PM_{10}	Unclassifiable/Attainment	**Nonattainment**
$PM_{2.5}$	Unclassifiable/Attainment	**Nonattainment**
Lead	Unclassifiable/Attainment	Attainment
Sulfates	No federal standard	Attainment
Hydrogen sulfide	No federal standard	Unclassified
Visibility-reducing particles	No federal standard	Unclassified
Vinyl chloride	No federal standard	No designation

Sources: EPA 2018b (National); CARB 2018 (California).
Notes:
Bold text = not in attainment; Attainment = meets the standards; Attainment (Maintenance) = achieves the standards after a nonattainment designation; Nonattainment = does not meet the standards; Unclassified or Unclassifiable = insufficient data to classify; Unclassifiable/Attainment = meets the standard or is expected to meet the standard despite a lack of monitoring data.
[a] The federal 1-hour standard of 0.12 parts per million was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in SIPs.

In summary, the SDAB is designated as a nonattainment area for national and California O_3 standards and state PM_{10} and $PM_{2.5}$ standards. The SDAB is designated as a nonattainment area for state PM_{10} and $PM_{2.5}$ standards; however, it is designated as an attainment area for federal PM_{10} and $PM_{2.5}$ standards. The SDAB is designated as an attainment area for national and California CO standards, national and California NO_2 standards, national and California SO_2 standards, and national and California lead standards.

2.3.2 Local Ambient Air Quality

CARB, air districts, and other agencies monitor ambient air quality at approximately 250 air quality monitoring stations across the state. The project site's local ambient air quality is monitored by the SDAPCD. As stated previously, an ambient air quality standard defines the maximum amount of a pollutant averaged over a specified period of time that can be present in outdoor air without harm to the public's health. Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. The most recent background ambient air quality data from 2016 to 2018 are presented in Table 3. The Del Mar–Mira Costa College monitoring station, located at 832 Camino Del Mar, is the nearest air quality monitoring station to the project site, located approximately 1.11 miles south of the project site. The data collected at this station are considered representative of the air quality experienced in the project site. Air quality data for O_3 from the Del Mar–Mira Costa College monitoring station is provided in Table 3. Because NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$ are not monitored at the Del Mar–Mira Costa College monitoring station, NO_2, PM_{10}, and $PM_{2.5}$ measurements were taken from the San Diego–Kearny Villa

Road monitoring station; CO measurements were taken from the Rancho Carmel Drive monitoring station; and SO_2 measurements were taken from the El Cajon–Floyd Smith Drive monitoring station.

California air districts have based their thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the air basin can accommodate without affecting the attainment date for the NAAQS or CAAQS. Since an ambient air quality standard is based on maximum pollutant levels in outdoor air that would not harm the public's health, and air district thresholds pertain to attainment of the ambient air quality standard, this means that the thresholds established by air districts are also protective of human health.

Table 3
Local Ambient Air Quality Data

Concentration or Exceedances	Ambient Air Quality Standard	2016	2017	2018
Ozone (O_3) – Del Mar–Mira Costa College Monitoring Station				
Maximum 1-hour concentration (ppm)	0.09 ppm (state)	0.079	0.075	ND
Number of days exceeding state standard		*1*	*1*	ND
Maximum 8-hour concentration (ppm)	0.070 ppm (state)	0.071	0.061	ND
	0.070 ppm (federal)	0.071	0.061	ND
Number of days exceeding state standard		*2*	*1*	*ND*
Number of days exceeding federal standard		*2*	*1*	*ND*
Nitrogen Dioxide (NO_2) – San Diego–Kearny Villa Road Monitoring Station Monitoring Station				
Maximum 1-hour concentration (ppm)	0.18 ppm (state)	0.053	0.054	0.045
	0.100 ppm (federal)	0.053	0.054	0.045
Number of days exceeding state standard		*0*	*0*	*0*
Number of days exceeding federal standard		*0*	*0*	*0*
Annual concentration (ppm)	0.030 ppm (state)	0.009	0.009	0.008
	0.053 ppm (federal)	—	—	—
Carbon Monoxide (CO) –11403 Rancho Carmel Drive				
Maximum 1-hour concentration (ppm)	20 ppm (state)	—	—	—
	35 ppm (federal)	2.0	1.5	1.9
Number of days exceeding state standard		—	—	—
Number of days exceeding federal standard		*0*	*0*	*0*
Maximum 8-hour concentration (ppm)	9.0 ppm (state)	—	—	—
	9 ppm (federal)	1.2	1.4	1.1
Number of days exceeding state standard		—	—	—
Number of days exceeding federal standard		*0*	*0*	*0*
Sulfur Dioxide (SO_2) – El Cajon–Floyd Smith Drive Monitoring Station				
Maximum 1-hour concentration (ppm)	0.075 ppm (federal)	0.006	0.011	0.035
Number of days exceeding federal standard		*0*	*0*	*0*
Maximum 24-hour concentration (ppm)	0.14 ppm (federal)	0.002	0.004	0.004
Number of days exceeding federal standard		*0*	*0*	*0*
Annual concentration (ppm)	0.030 ppm (federal)	0.001	0.001	0.001

Table 3
Local Ambient Air Quality Data

Concentration or Exceedances	Ambient Air Quality Standard	2016	2017	2018
Coarse Particulate Matter (PM_{10}) – San Diego–Kearny Villa Road Monitoring Station				
Maximum 24-hour concentration (μg/m³)	50 μg/m³ (state)	35.0	47.0	38.0
	150 μg/m³ (federal)	36.0	46.0	38.0
Number of days exceeding state standard[a]		*ND (0)*	*0.0 (0)*	*0.0 (0)*
Number of days exceeding federal standard[a]		*0.0 (0)*	*0.0 (0)*	*0.0 (0)*
Annual concentration (state method) (μg/m³)	20 μg/m³ (state)	ND	17.6	18.4
Fine Particulate Matter ($PM_{2.5}$) – San Diego–Kearny Villa Road Monitoring Station				
Maximum 24-hour concentration (μg/m³)	35 μg/m³ (federal)	19.4	27.5	32.2
Number of days exceeding federal standard[a]		*0 (0)*	*0 (0)*	*0.0 (0)*
Annual concentration (μg/m³)	12 μg/m³ (state)	7.8	8.0	8.3
	12.0 μg/m³ (federal)	7.5	7.9	8.3

Sources: CARB 2019f; EPA 2019a.

Notes: — = not available; μg/m3 = micrograms per cubic meter; ND = insufficient data available to determine the value; ppm = parts per million
Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.
Exceedances of federal and state standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed federal or state standards during the years shown. There is no federal standard for 1-hour O_3, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.
Del Mar-Mira Costa College Monitoring Station is located at 832 Camino Del Mar, Del Mar, California 92014.
San Diego–Kearny Villa Road Monitoring Station is located at 6125A Kearny Villa Road, San Diego, California 92145.
El Cajon–Floyd Smith Drive Monitoring Station is located at 10537 Floyd Smith Drive, El Cajon, California 92020.

[a] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

2.4 Significance Criteria and Methodology

2.4.1 Thresholds of Significance

The State of California has developed guidelines to address the significance of air quality impacts based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), which provides guidance that a project would have a significant environmental impact if it would:

1. Conflict with or obstruct the implementation of the applicable air quality plan;
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for O_3 precursors);

4. Expose sensitive receptors to substantial pollutant concentrations; or
5. Create objectionable odors affecting a substantial number of people.

Appendix G of the CEQA Guidelines indicates that, where available, the significance criteria established by the applicable air quality management district or pollution control district may be relied upon to determine whether the project would have a significant impact on air quality.

The City has not adopted numerical thresholds of significant for determining whether air quality impacts are significant. As part of its air quality permitting process, the SDAPCD has established thresholds in Rule 20.2 requiring the preparation of Air Quality Impact Assessments for permitted stationary sources. The SDAPCD sets forth quantitative emission thresholds below which a stationary source would not have a significant impact on ambient air quality. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 4 are exceeded. For CEQA purposes, these screening criteria can be used as numeric methods to demonstrate that a project's total emissions would not result in a significant impact to air quality.

Table 4
San Diego Air Pollution Control District Air Quality Significance Thresholds

Construction Emissions			
Pollutant	*Total Emissions (Pounds per Day)*		
Respirable Particulate Matter (PM_{10})	100		
Fine Particulate Matter ($PM_{2.5}$)[1]	55		
Oxides of Nitrogen (NO_x)	250		
Oxides of Sulfur (SO_x)	250		
Carbon Monoxide (CO)	550		
Volatile Organic Compounds (VOC)[2]	137		
Operational Emissions			
Pollutant	*Total Emissions*		
	Pounds per Hour	*Pounds per Day*	*Tons per Year*
Respirable Particulate Matter (PM_{10})	—	100	15
Fine Particulate Matter ($PM_{2.5}$)[1]	—	55	10
Oxides of Nitrogen (NO_x)	25	250	40
Sulfur Oxides (SO_x)	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds	—	3.2	0.6
Operational Emissions			
Pollutant	*Total Emissions*		
	Pounds per Hour	*Pounds per Day*	*Tons per Year*
Volatile Organic Compounds (VOC)[2]	—	137	13.7

Source: SDAPCD Rule 20.2(d)(2) (SDAPCD 1998).

[1] $PM_{2.5}$ is not currently regulated under SDAPCD Rule 20.2. $PM_{2.5}$ thresholds are based on South Coast Air Quality Management District (SCAQMD) significance thresholds of 55 pounds per day for construction and operation and 10 tons per year for operation.

[2] VOC threshold based on the significance thresholds recommended by the Monterey Bay Air Resources District for the North Central Coast Air Basin, which has similar federal and state attainment status as the basin for O_3.

The evaluation whether the project would conflict with or obstruct implementation of the SDAPCD 2016 RAQS (threshold criterion 1) is based on the potential for the project to conflict with the underlying land use assumptions (i.e., general plan land use designations) in the RAQS.

The SDAPCD Air Quality Significance Thresholds shown in Table 4 were used to determine significance of project-generated criteria air pollutants; specifically, the project's potential to violate any air quality standard or contribute substantially to an existing or projected air quality violation (as assessed under the threshold criterion 2). The pounds per day threshold for construction and operational emissions are the same, which is applied in this analysis. The emissions-based thresholds for O_3 precursors are intended to serve as a surrogate for an "O_3 significance threshold" (i.e., the potential for adverse O_3 impacts to occur). This approach is used because O_3 is not emitted directly (see the discussion of O_3 and its sources in Section 2.1.2, Pollutants and Effects) and the effects of an individual project's emissions of O_3 precursors (VOC and NO_x) on O_3 levels in ambient air cannot be determined through air quality models or other quantitative methods. Emissions below the screening-level thresholds would not cause a significant impact.[4]

For nonattainment pollutants, if emissions exceed the thresholds shown in Table 4, the project could have the potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality (as assessed under the threshold criterion 3).

In regards to the analysis of potential impacts to sensitive receptors (threshold criterion 4), the City specifically recommends consideration of sensitive receptors in locations such as day care centers, schools, retirement homes, and hospitals, or medical patients in residential homes close to major roadways or stationary sources, which could be impacted by air pollutants.

SDAPCD Rule 51 (Public Nuisance) prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. Regarding threshold criterion 5, a project that proposes a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

[4] In the event that emissions of attainment pollutants exceed thresholds listed in Table 4, dispersion modeling could be conducted to demonstrate that the project's emissions of attainment pollutants, in combination with ground-level background concentrations, are below the CAAQS and NAAQS. If project-generated emissions of nonattainment pollutants exceed thresholds listed in Table 4, then the project would have a potentially significant impact in regards to the potential to violate any air quality standard or contribute substantially to an existing or projected air quality violation.

2.4.2 Approach and Methodology

2.4.2.1 Construction

Emissions from the construction phase of the project were estimated using California Emissions Estimator Model (CalEEMod) Version 2016.3.2. Construction scenario assumptions, including phasing, equipment mix, and vehicle trips, were based on information provided by the project applicant and CalEEMod default values when project specifics were not known.

For purposes of estimating project emissions, and based on information provided by the project applicant, it is assumed that construction of the project would commence in October 2020 and would last approximately 26 months, ending in November 2022. The analysis contained herein is based on the following assumptions (duration of phases is approximate):

- Site Preparation and Demolition: 1 month (October 2020 – November 2020)
- Grading and Pipeline Construction: 2 months (November 2020 – January 2021)
- Building Construction: 20 months (January 2021 – September 2022)
- Paving: 2 months (September 2022 – November 2022)
- Architectural Coatings: 18 months[5] (April 2021 – November 2022)

Installation of utilities was assumed to occur during the grading phase. In addition, installation of approximately 4,000 to 5,000 linear feet of a new pipeline would involve an open trench to be dug for the direct installation of pipeline, which would occur concurrent with the grading phase. The sequence of activities for open-trench pipeline construction would typically commence with trenching and excavation, followed by pipe installation and covering of the installed pipe, and concluding with paving the pipeline corridor area of disturbance. For the purposes of quantifying emissions from daily construction activity associated with pipeline construction, it was assumed that contractors would complete approximately 75 to 100 linear feet of pipeline installation could occur each day depending on the component under construction and total linear feet of pipeline or conveyance infrastructure to be constructed over a given period; however, daily activity and linear feet installed would vary depending on field conditions, site/easement access, and other factors associated with continual site location changes.[6]

Both the parking garage and the residential development would be painted during the architectural coating phase. The paving phase and the architectural coating phase end during the same month because the paving phase duration includes finalization of the project construction and exterior improvements.

[5] Architectural coating would occur intermittently during building construction and paving.
[6] Linear feet per day assumptions based on typical construction practices for pipeline construction, and review of related projects.

For the analysis, it was generally assumed that heavy construction equipment would be operating at the site for approximately 8 hours per day, 5 days per week (22 days per month), during project construction.

Construction worker estimates and vendor truck trips by construction phase were based on CalEEMod default values. Haul truck trips during the grading phase were based on project applicant-provided earthwork quantities. Grading is estimated to involve 43,000 cubic yards of soil for export. Assuming a haul truck capacity of 16 cubic yards per truck, earth-moving activities would result in approximately 2,688 round trips (5,376 one-way truck trips) during the grading phase. CalEEMod default trip length values were used for the distances for all construction-related trips.

The construction equipment mix and vehicle trips used for estimating the project-generated construction emissions are shown in Table 5.

Table 5
Construction Scenario Assumptions

Construction Phase	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Site Preparation and Demolition	18	4	26	Rubber Tired Dozers	5	8
				Tractors/Loaders/Backhoes	4	8
				Concrete/Industrial Saws	1	8
				Excavators	3	8
Grading	20	4	5,376	Excavators	2	8
				Graders	1	8
				Rubber Tired Dozers	1	8
				Scrapers	2	8
				Tractors/Loaders/Backhoes	2	8
Pipeline Site Preparation	6	0	0	Concrete/Industrial Saws	1	8
Pipeline Installation and Backfill	4	2	0	Excavators	1	8
				Generator Sets	1	8
				Tractors/Loaders/Backhoes	1	8
Pipeline Paving	4	2	0	Graders	1	8
				Paving Equipment	1	8
				Rollers	1	8
Building Construction	174	50	0	Cranes	1	7
				Forklifts	3	8
				Generator Sets	1	8
				Tractors/Loaders/Backhoes	3	7
				Welders	1	8
Paving	16	4	0	Pavers	2	8
				Paving Equipment	2	8
				Rollers	2	8

Table 5
Construction Scenario Assumptions

Construction Phase	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Architectural Coating	36	4	0	Air Compressors	1	6

Notes: See Appendix A for details.

2.4.2.2 Operation

Emissions from the operational phase of the project were estimated using CalEEMod Version 2016.3.2. Operational year 2023 was assumed, consistent with the construction schedule.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with natural gas usage in space heating, water heating, and stoves are calculated in the building energy use module of CalEEMod, as described in the following text. The project would include 176 natural gas fireplaces.[7]

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2017). Consumer product VOC emissions are estimated in CalEEMod based on the floor area of residential and nonresidential buildings and on the default factor of pounds of VOC per building square foot per day. For parking lot land uses, CalEEMod estimates VOC emissions associated with use of parking surface degreasers based on a square footage of parking surface area and pounds of VOC per square foot per day.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as in paints and primers used during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of residential and nonresidential surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The project would use no or low VOC paint in construction and regular maintenance activities (Dudek 2018). Low VOC paint is generally considered to contain

[7] Each of the 146 dwelling units would have one natural gas fireplace. Additionally, 10 natural fire pits outdoors and up to 20 natural gas fireplaces in the hotel would be included in the project.

less than 50 grams of VOC per liter, however to provide a conservative analysis, a VOC content of 50 grams per liter was assumed for interior painting and a VOC content of 100 grams per liter was assumed for exterior painting.[8] Consistent with CalEEMod default values, a VOC content of 250 was assumed for the parking structures These assumptions were used in both the construction and operational phases as the resort operator will manage architectural coatings for construction and reapplication for maintenance purposes. The model default reapplication rate of 10% of area per year is assumed. Consistent with CalEEMod defaults, it is assumed that the residential surface area for painting equals 2.7 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating. For nonresidential land uses (e.g., community and fitness rooms), it is assumed that the surface area for painting equals 2.0 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating. For the parking garage, the architectural coating area is assumed to be 6% of the total square footage, consistent with the supporting CalEEMod studies provided as an appendix to the CalEEMod User's Guide (CAPCOA 2017).

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers. The emissions associated from landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per residential dwelling unit per day and grams per square foot of nonresidential building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days (CAPCOA 2017). By design, the project would limit turf, and the proposed landscaped area would be minimal and any landscape equipment used is anticipated to be powered by electricity, when needed. Nonetheless, emissions associated with potential landscape maintenance equipment were included and no emission reduction features related to electric landscape equipment was assumed to conservatively capture potential project operational emission sources.

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage (non-hearth). Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site.

[8] Per the SDAPCD Rule 67.0.1, the VOC content limits for the three general coatings categories are 50 grams per liter VOC for flat coatings, 100 grams per liter VOC for non-flat coatings, and 150 grams per liter VOC for non-flat high-gloss coatings. While the project would use low VOC paint for interior and exterior application as a sustainability feature, assuming a maximum of 100 grams per liter VOC for exterior paint and finishes provides a conservative analysis in the event a small portion of exterior coatings, such as trim, would have a VOC greater than 50 grams per liter.

Project-specific energy demand for the structures and pools was estimated using the Energy Star Target Finder tool (Glumac 2019). As stated in PDF-AQ/GHG-2, the project would include installation of a total of 701-kilowatt in photovoltaic systems that would produce an estimated 45% of project-wide demand including project-wide water heating demand.

Mobile Sources

Mobile sources for the project would be motor vehicles (i.e., automobiles and light-duty trucks) traveling to and from the project site. Motor vehicles may be fueled with gasoline, diesel, or alternative fuels. Default vehicle trip generation rates included in CalEEMod for each of the analyzed land uses were adjusted to match the project's trip generation rates presented in the Transportation Impact Analysis prepared for the project by Linscott, Law & Greenspan (LLG) (LLG 2019)[9]. In addition, CalEEMod default trip distances were adjusted accordingly based on the weekday VMT of 10,967 miles and a Saturday and Sunday VMT of 12,833 miles. Therefore, it was assumed that each land use would result in a trip length of approximately 7.9 miles for the villa, single-family homes, affordable housing, and market rate hotel components and 7.6 miles for the hotel. CalEEMod default data, including emissions factors were conservatively used for the model inputs to estimate daily emissions from proposed vehicular sources. In accordance with PDF-AQ/GHG-4 (see Section 1.4, Project Design Features), a range of TDM measures including providing each employee would be offered a free monthly transit pass would be implemented to reduce VMT. To be conservative this analysis did not quantify the GHG emission reduction associated with the TDM program. Emission factors representing the vehicle mix and emissions for 2023 were used to estimate emissions associated with full build-out of the project. Trip rate assumptions for the project are shown in Table 6.

Table 6
Project Trip Rate Assumptions

Land Use	CalEEMod Land Use Surrogate	Revised Trip Rate		
		Weekday	*Saturday*	*Sunday*
Hotel	Hotel	8.00	10.50	10.50
Villa	Condo/Townhouse	8.00	8.14	8.14
Single Family Homes	Single Family Housing	12.00	12.00	12.00
Affordable Housing	Apartment Low Rise	6.00	8.14	8.14
Market Rate Hotel	Motel	6.00	8.14	8.14

Source: LLG 2019.

[9] The project would include 65 luxury hotel rooms, 10 low cost inn units, 81 villas, 4 work force housing units, and 22 affordable housing units. This would result in 75 hotel rooms and 107 dwelling units.

2.5 Impact Analysis

2.5.1 Would the project conflict with or obstruct implementation of the applicable air quality plan?

As stated in Section 2.3, Regionals and Local Air Quality Conditions, SDAPCD and SANDAG are responsible for developing and implementing the clean air plans for attainment and maintenance of the ambient air quality standards in the SDAB—specifically, the SIP and RAQS.[10] The federal O_3 maintenance plan was adopted in December 2016. The SIP includes a demonstration that current strategies and tactics will maintain acceptable air quality in the SDAB based on the NAAQS. The RAQS was initially adopted in 1991 and was most recently updated in 2016. The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O_3. The SIP and RAQS rely on information from CARB and SANDAG, including mobile and area source emissions as well as information regarding projected growth in San Diego County as a whole and the cities in the County, to project future emissions and determine the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by San Diego County and the cities in the County as part of the development of their general plans.

The RAQS also relies on information from CARB and SANDAG, vehicle trends, and land-use plans developed by the cities and by San Diego County as part of development of their general plans. As such, if a project would entail development that is greater than that anticipated in the local plan and SANDAG's growth projections, the project might be in conflict with the SIP and RAQS and may contribute to a potentially significant cumulative impact on air quality. The project site is zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density). The City's 1985 Community Plan designates the project site as Public Parkland (City of Del Mar 1985). The project would re-designate the project site as Specific Plan, which includes 65 hotel guest rooms, 31 villas (some of which may be used as hotel guest rooms when not in use by owners, subject to provisions in the Specific Plan), 10 lower-cost shared visitor-serving accommodations, 22 affordable housing units, and associated amenities. Amenities include, but are not limited to, restaurants, bar/lounge, special event space, meeting space, swimming pools, a spa and fitness center, and retail. The project would change the designation of the project site from R1-14 (Modified Low Density) and R1-40 (Very Low Density) to Specific Plan, allowing for recreational and commercial uses.

[10] For the purpose of this discussion, the relevant federal air quality plan is the ozone maintenance plan (SDAPCD 2016b). The RAQS is the applicable plan for purposes of state air quality planning. Both plans reflect growth projections in the basin.

While the SDAPCD and the City do not provide guidance regarding the analysis of impacts associated with air quality plan conformance, the County's Guidelines for Determining Significance and Report and Format and Content Requirements – Air Quality does discuss conformance with the RAQS (County of San Diego 2007). The guidance indicates that if a project, in conjunction with other projects, contributes to growth projections that would not exceed SANDAG's growth projections for the City, the project would not be in conflict with the RAQS (County of San Diego 2007). As previously discussed, the project would change the designation of the project site in order to refine the land uses allowable for the project site.

The guidance also indicates that, in the event that a project changes the zoning designation, additional analysis may still provide substantial evidence that the growth is accounted for in the RAQS assumptions. To demonstrate conformance in this case, a growth projection analysis can be completed for the applicable Subregional Area (SRA) and/or Metropolitan Statistical Area by comparing the SANDAG growth projections with the actual development expected to occur. If the project, in conjunction with other projects, contributes to growth projections that would not exceed SANDAG's growth projections for that SRA or Metropolitan Statistical Area, the project would not be in conflict with the RAQS or SIP.

The project is located within SRA 13 – Del Mar-Mira Mesa, which includes the City in its entirety. SANDAG's population estimate for this SRA in 2012, when the most recent RAQS was adopted, was 160,668, and the forecasted population in 2020 (the closest year for which SANDAG has available data to a project buildout of 2023) is 195,024. Therefore, SANDAG's projections anticipated approximately 34,356 new residents in this SRA over an 8-year period (SANDAG 2013).

The addition of 199 new residents[11] to the SRA as a result of the project would be accommodated in the population forecast used to prepare the 2016 RAQS. While the project was not included in the underlying growth estimates for the SDAB used as the basis for the SIP and RAQS update, it would not conflict with or obstruct implementation of the SIP or RAQS because the SANDAG population projections for SRA 13 would accommodate more growth (34,356 new residents) than that associated with the project (199 residents). Because the growth forecasts and development assumptions upon which the SIP and RAQS are based would not be exceeded, the project would not conflict with or obstruct implementation of the applicable air quality plan and impacts would be **less than significant**.

[11] The household size of the villas was assumed to be 2.02 persons consistent with the average household size in the City of Del Mar. Each workforce housing unit was assumed to have one resident.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

2.5.2 Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Construction Emissions

Construction of the project would result in a temporary, short-term addition of pollutants to the local airshed caused by soil disturbance, fugitive dust emissions, and combustion pollutants from on-site construction equipment, as well as from off-site trucks hauling construction materials. Emissions resulting from construction of the project would be temporary because construction activities would occur intermittently over the construction phase of the project, and construction activities and associated emissions would cease following project build-out. Construction emissions can vary substantially from day to day depending on the level of activity, the specific type of operation, and, for dust, prevailing weather conditions. For the purposes of modeling, a worst-case maximum daily emission scenario for project construction activities is analyzed. Fugitive dust (i.e., PM_{10} and $PM_{2.5}$) emissions would primarily result from grading and site preparation activities. NO_x and CO emissions would primarily result from the use of construction equipment and motor vehicles. VOC emissions would primarily result from asphalt and architectural coating off-gassing.

Emissions from the construction phase of the project were estimated using CalEEMod. Construction of the project is anticipated to commence in October 2020, occurring over an approximately 26-month period. A detailed description of construction subphases as well as other assumptions made for the purposes of modeling is included in Appendix A of this report.

Construction subphases would overlap in some instances to meet the provided construction schedule. This overlap is accounted for in the construction emissions estimates. Construction of the project would involve approximately 43,000 cubic yards of soil export. A more detailed description of the construction schedule, including information regarding subphases and equipment used during each subphase, is included in Appendix A.

Construction worker and vendor trip assumptions were assigned to each construction subphase to determine criteria air pollutant emissions from these sources. Construction worker and vendor trips for construction were determined using CalEEMod default worker trip and vendor trip vehicle generation factors. The construction equipment mix was provided by the applicant and represents a reasonably

conservative estimate of construction activity. Where project-specific construction equipment information was not available, CalEEMod default equipment mixes were used. For the analysis, it was generally assumed that heavy construction equipment would be operating at the site for approximately 8 hours per day, 5 days per week (22 days per month) during project construction.

The project is subject to SDAPCD Rule 55: Fugitive Dust Control. This rule requires actions to restrict visible emissions of fugitive dust beyond the property line. Compliance with Rule 55 would limit fugitive dust (i.e., PM_{10} and $PM_{2.5}$) that may be generated during grading and construction activities. To account for dust control measures in the calculations, it was assumed that the active sites would be watered at least two times daily, resulting in an approximately 55% reduction of particulate matter. The project is also subject to SDAPCD Rule 67.0: Architectural Coatings. This rule establishes maximum VOC contents of 50 and 100 grams per liter for flat and non-flat coatings, respectively. CalEEMod default values of 250 grams per liter for residential and non-residential interior coatings and 250 grams per liter for residential and non-residential exterior coatings were replaced with VOC contents of 50 and 100 grams per liter.

Table 7 shows the estimated maximum daily construction emissions associated with the construction phases of the project. Complete details of the emissions calculations are provided in Appendix A.

Table 7
Estimated Maximum Daily Construction Criteria Air Pollutant Emissions

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
2020	7.98	106.35	59.90	0.20	12.65	8.35
2021	9.30	87.75	45.80	0.17	15.03	6.09
2022	9.04	22.69	24.68	0.06	3.00	1.43
Maximum Daily Emissions	**9.30**	**106.35**	**59.90**	**0.20**	**15.03**	**8.35**
SDAPCD Threshold	*137*	*250*	*550*	*250*	*100*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: See Appendix A for detailed results.
Notes: The values shown are the maximum summer or winter daily emissions results from CalEEMod.
These estimates reflect control of fugitive dust required by San Diego Air Pollution Control District (SDAPCD) Rule 55 (water a minimum twice per day) and SDAPCD Rule 67, which limits VOC content of architectural coatings.
VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter

As shown in Table 7, daily construction emissions would not exceed SDAPCD's significance thresholds for any criteria air pollutant. Therefore, impacts would be **less than significant**.

Operational Emissions

The project involves development of 65 hotel guest rooms, 31 villas (some of which may be used as hotel guest rooms when not in use by owners, subject to provisions in the Specific Plan), 10 lower-cost shared visitor-serving accommodations, 22 affordable housing units, and associated amenities. Operation of the project would generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources, including vehicle trips from future residents; area sources, including the use of consumer products, architectural coatings for repainting, and landscape maintenance equipment; and energy sources, including combustion of fuels used for space and water heating and cooking appliances. Operation, pollutant emissions associated with long-term operations were quantified using CalEEMod. Project-generated mobile source emissions were estimated in CalEEMod based on project-specific trip rates. CalEEMod default values were used to estimate emissions from the project area and energy sources.

Table 8 presents the maximum daily area, energy, and mobile source emissions associated with operation (year 2023) of the project. The values shown are the maximum summer or winter daily emissions results from CalEEMod. Details of the emission calculations are provided in Appendix A.

Table 8
Estimated Maximum Daily Operational Criteria Air Pollutant Emissions

Emission Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Area Sources	8.92	3.02	10.09	0.02	0.29	0.29
Energy	0.52	4.59	2.69	0.03	0.36	0.36
Reduction from Solar Hot Water System[a]	(0.05)	(0.43)	(0.36)	0.00	(0.03)	(0.03)
Mobile	2.52	9.53	29.94	0.11	9.99	2.72
Total	11.91	16.71	42.36	0.16	10.61	3.34
Emission Threshold	*137*	*250*	*550*	*250*	*100*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: See Appendix A for detailed results.
Notes: The values shown are the maximum summer or winter daily emissions results from the California Emissions Estimator Model (CalEEMod). These estimates reflect compliance with SDAPCD Rule 67, which limits VOC content of architectural coatings, assumed no wood burning devices. VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter
[a] The project would generate 16,000 therms per year of for hot water demand. This would offset natural gas emissions. Refer to Appendix C.

As shown in Table 8, daily operational emissions would not exceed the significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$. As such, the project's operational impacts on air quality would be **less than significant**.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

2.5.3 Would the project 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

In analyzing cumulative impacts from the project, the analysis must specifically evaluate a project's contribution to the cumulative increase in pollutants for which the SDAB is designated as nonattainment for the CAAQS and NAAQS. If the project does not exceed thresholds and is determined to have less-than-significant project-specific impacts, it may still contribute to a significant cumulative impact on air quality if the emissions from the project, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess of established thresholds. However, the project would only be considered to have a significant cumulative impact if the project's contribution accounts for a significant proportion of the cumulative total emissions (i.e., it represents a "cumulatively considerable contribution" to the cumulative air quality impact).

The SDAB has been designated as a federal nonattainment area for O_3 and a state nonattainment area for O_3, PM_{10}, and $PM_{2.5}$. PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the SDAB. As discussed previously, the project-generated emissions of VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ would be below the significance thresholds for both construction and operational activities. As such, the project would result in less than significant impacts to air quality relative to construction and operational emissions.

Based on the considerations described above, cumulative impacts would be **less than significant**.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

2.5.4 Would the project expose sensitive receptors to substantial pollutant concentrations?

Air quality varies as a direct function of the amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Air quality problems arise when the rate of pollutant emissions exceeds the rate of dispersion. Reduced visibility, eye irritation, and adverse health impacts upon those persons termed "sensitive receptors" are the most serious hazards of existing air quality conditions in the area. Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. Sensitive receptors include residences, schools, playgrounds, child-care centers, athletic facilities, long-term health-care facilities, rehabilitation centers, convalescent centers, and retirement homes. The nearest existing sensitive receptors are located adjacent to the project site's northern boundary. Receptors also include visitors and residents of the project.

Health Impacts of Toxic Air Contaminants

In addition to impacts from criteria pollutants, project impacts may include emissions of pollutants identified by the state and federal government as TACs or HAPs. State law has established the framework for California's TAC identification and control program, which is generally more stringent than the federal program and aimed at TACs that are a problem in California. The state has formally identified more than 200 substances as TACs, including the federal HAPs, and is adopting appropriate control measures for sources of these TACs. The greatest potential for TAC emissions during construction would be diesel particulate emissions from heavy equipment operations and heavy-duty trucks and the associated health impacts to sensitive receptors. The following measures are required by state law to reduce DPM emissions:

- Fleet owners of mobile construction equipment are subject to the CARB Regulation for In-use Off-road Diesel Vehicles (13 CCR 2449), the purpose of which is to reduce DPM and criteria pollutant emissions from in-use (existing) off-road diesel-fueled vehicles.
- All commercial diesel vehicles are subject to Title 13, Section 2485 of the California Code of Regulations, limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading shall be limited to five minutes; electric auxiliary power units should be used whenever possible.

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. The SDAPCD recommends an incremental cancer risk threshold of 10 in a million (SDAPCD 2015b). "Incremental cancer risk" is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period will contract cancer based on the use of standard Office of Environmental Health Hazard Assessment risk-assessment methodology. The project would not require the extensive operation of heavy-

duty construction equipment, which is subject to a CARB Airborne Toxics Control Measure for in-use diesel construction equipment to reduce diesel particulate emissions and would not involve extensive use of diesel trucks, which are also subject to a CARB Airborne Toxics Control Measure.

As shown in Table 6, maximum daily particulate matter (i.e., PM_{10} or $PM_{2.5}$) emissions generated by construction equipment operation and haul-truck trips during construction (exhaust particulate matter, or DPM), combined with fugitive dust generated by equipment operation and vehicle travel, would be well below the SDAPCD significance thresholds. Moreover, total construction of the project would last approximately 24 months, after which project-related TAC emissions would cease. Thus, the project would not result in a long-term source of TAC emissions. No residual TAC emissions and corresponding cancer risk are anticipated after construction, and no long-term sources of TAC emissions are anticipated during operation of the project. Therefore, the exposure of project-related TAC emission impacts to sensitive receptors would be **less than significant**.

Additionally, CARB has published the *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB 2005), which identifies certain types of facilities or sources that may emit substantial quantities of TACs and therefore could conflict with sensitive land uses, such as "schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities." The *Air Quality and Land Use Handbook* is a guide for siting of new sensitive land uses, but it does not mandate specific separation distances to avoid potential health impacts. The enumerated facilities or sources include the following:

- High-traffic freeways and roads
- Distribution centers
- Rail yards
- Ports
- Refineries
- Chrome plating facilities
- Dry cleaners
- Large gas dispensing facilities.

CARB recommends that sensitive receptors not be located downwind or in proximity to such sources to avoid potential health hazards.

The project would neither include any of the previously listed land uses nor expose visitors, residents, and employees of the project to TAC emissions from these sources. Impacts would be **less than significant**.

Health Impacts of Carbon Monoxide

Exposure to high concentrations of CO can result in dizziness, fatigue, chest pain, headaches, and impairment of central nervous system functions. Mobile-source impacts, including those related to CO, occur essentially on two scales of motion. Regionally, project-related construction travel would add to regional trip generation and increase the VMT within the local airshed and the SDAB. Locally, construction traffic would be added to the roadway system in the vicinity of the project site. Although the SDAB is currently an attainment area for CO, there is a potential for the formation of microscale CO "hotspots" to occur immediately around points of congested traffic. Hotspots can form if such traffic occurs during periods of poor atmospheric ventilation, is composed of a large number of vehicles cold-started and operating at pollution-inefficient speeds, and/or is operating on roadways already crowded with non-project traffic. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SDAB is steadily decreasing.

CO transport is extremely limited and CO disperses rapidly with distance from the source. Under certain extreme meteorological conditions, however, CO concentrations near a congested roadway or intersection may reach unhealthy levels, affecting sensitive receptors such as residents, schoolchildren, hospital patients, and the elderly. Typically, high CO concentrations are associated with urban roadways or intersections operating at an unacceptable level of service (LOS). Projects contributing to adverse traffic impacts may result in the formation of CO hotspots.

To verify that the project would not cause or contribute to a violation of the CO standards, a screening evaluation of the potential for CO hotspots was conducted. The California Department of Transportation (Caltrans) and the University of California, Davis, Institute of Transportation Studies *Transportation Project-Level Carbon Monoxide Protocol* (Caltrans 2010) were followed. CO hotspots are typically evaluated when (1) the LOS of an intersection or roadway decreases to LOS E or worse, (2) signalization and/or channelization is added to an intersection, and (3) sensitive receptors such as residences, schools, and hospitals are located in the vicinity of the affected intersection or roadway segment.

The Transportation Impact Analysis prepared for the project (LLG 2019) analyzed Existing, Near-Term, and Horizon Year 2035 conditions at 19 intersections near the project site. The results of the LOS assessment show that under Horizon Year 2035, 5 of the 19 study intersections are forecasted to operate at unacceptable LOS (LOS E or worse) during the peak hours. As shown in Appendix B, the five key study intersections according to the criteria above are

- Hwy 101 (Border Ave)/Via De La Valle (LOS B in AM and E in PM);
- Via De La Valle/S. Cedros Ave (LOS F in AM and F in PM);

- Via De La Valle/Jimmy Durante Blvd (LOS E in AM and E in PM);
- Camino Del Mar/27th Ave (LOS C in AM and E in PM);
- Camino Del Mar/Coast St (LOS C in AM and F in PM);

The remaining key intersections currently operate at an acceptable LOS during the AM and PM peak hours.

For Horizon Year 2035, the peak-hour intersection volumes were compared to the San Diego County peak-hour volume screening thresholds of 3,000 peak-hour trips for project-related impacts and 2,000 peak-hour trips for cumulatively considerable impacts (County of San Diego 2007). Three intersections were found to exceed the screening level thresholds; (1) Hwy 101 (Border Ave)/Via De La Valle (Camino Del Mar) (LOS E in PM); (2) Via De La Valle/S. Cedros Ave (LOS F in AM and PM); (3) Via De La Valle/Jimmy Durante Blvd (LOS E in AM and PM). All three intersections were evaluated in the Horizon scenario for CO hotspots. For each intersection, the highest volume (AM or PM) was used in the analysis as the worst-case scenario. The potential impact of the project on local CO levels was assessed at these intersections with the Caltrans CL4 interface based on the California LINE Source Dispersion Model (CALINE4), which allows microscale CO concentrations to be estimated along each roadway corridor or near intersections (Caltrans 1998a).

The emissions factor represents the weighted average emissions rate of the local San Diego County vehicle fleet expressed in grams per mile per vehicle. Consistent with the traffic scenario, emissions factors for 2035 were used for the three intersections. Emissions factors were predicted by EMFAC2014 based on a 5-mile-per-hour average speed for all of the intersections for approach and departure segments. The hourly traffic volume anticipated to travel on each link, in units of vehicles per hour, was based on information provided by the traffic consultant and modeling assumptions are outlined in Appendix B.

Four receptor locations were modeled at each intersection to determine CO ambient concentrations. A receptor was assumed on the sidewalk at each corner of the modeled intersections, to represent the future possibility of extended outdoor exposure. CO concentrations were modeled at these locations to assess the maximum potential CO exposure that could occur in and 2035. Since the cumulative traffic volumes in 2035 would be greater than 2023, if no impact is found in 2035, it can be assumed there would also be no near-term impact. A receptor height of 5.9 feet (1.8 meters) was used in accordance with Caltrans recommendations for all receptor locations (Caltrans 1998b).

The SCAQMD guidance recommends using the highest 1-hour measurement in the last 3 years as the projected future 1-hour CO background concentration for the analysis. A CO concentration of 2.0 parts per million by volume (ppm) was recorded in 2016 for the 11403 Rancho Carmel Drive monitoring station in San Diego and was assumed in the CALINE4 model for 2035. Data from 2015

was chosen as reflected the highest background concentration of the three most recent years for which data is available. To estimate an 8-hour average CO concentration, a persistence factor of 0.70, as calculated based on SCAQMD guidance (SCAQMD 1993), was applied to the output values of predicted concentrations in ppm at each of the receptor locations.

The results of the model are shown in Table 9. Model input and output data are provided in Appendix B.

Table 9
CALINE4 Predicted Carbon Monoxide Concentrations

Intersection	Maximum Modeled Impact (ppm)	
	1-hour	*8-hour*[a]
Hwy 101 (Border Ave)/Via De La Valle (Camino Del Mar)	2.8	2.0
Via De La Valle/S. Cedros Ave	2.7	1.9
Via De La Valle/Jimmy Durante Blvd	2.8	2.0

Source: Caltrans 1998a (CALINE4).
Notes: ppm = parts per million by volume.
[a] 8-hour concentrations were obtained by multiplying the 1-hour concentration by a persistence factor of 0.70 (SCAQMD 1993).

As shown in Table 9, the maximum CO concentration predicted for the 1-hour averaging period at the studied intersections would be 2.8 ppm, which is below the 1-hour CO CAAQS of 20 ppm (CARB 2016). The maximum predicted 8-hour CO concentration of 2.0 ppm at the studied intersections would be below the 8-hour CO CAAQS of 9.0 ppm (CARB 2016). Neither the 1-hour nor 8-hour CAAQS would be equaled or exceeded at any of the intersections studied. Accordingly, the project would not cause or contribute to violations of the CAAQS and would not result in exposure of sensitive receptors to localized high concentrations of CO. As such, impacts to sensitive receptors with regard to potential CO hotspots resulting from project contribution to cumulative traffic-related air quality impacts would be **less than significant**.

Health Impacts of Other Criteria Air Pollutants

Table 10 presents a list of the criteria pollutants and other related pollutants of concern, emission sources, associated health effects, and current SDAB attainment status.

Table 10
Pollutants, Sources, Health Effects, and Attainment Status

Pollutant	Sources	Health Effects	Attainment Status	
			NAAQS	*CAAQS*
O_3	Formed when VOCs and NO_x react in the presence of sunlight. VOC sources include any source that burns fuels (e.g., gasoline, natural gas, wood, oil); solvents; petroleum processing and storage.	Breathing difficulties, lung tissue damage, vegetation damage, damage to rubber and some plastics.	Attainment	Nonattainment
PM_{10}	Road dust, windblown dust, agriculture and construction, fireplaces. Also formed from other pollutants (NO_x, SO_x, organics). Incomplete combustion.	Increases respiratory disease, lung damage, cancer, premature death, reduced visibility, surface soiling.	Unclassifiable	Nonattainment
$PM_{2.5}$	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning. Also formed from reaction of other pollutants (e.g., NO_x, SO_x, organics, and NH_3).	Increases respiratory disease, lung damage, cancer, and premature death, reduced visibility, surface soiling. Particles can aggravate heart diseases such as congestive heart failure and coronary artery disease.	Attainment	Nonattainment
CO	Any source that burns fuel such as automobiles, trucks, heavy construction and farming equipment, residential heating.	Chest pain in heart patients, headaches, reduced mental alertness.	Attainment	Attainment
NO_2	See CO.	Lung irritation and damage. Reacts in the atmosphere to form O_3 and acid rain.	Unclassifiable/ Attainment	Attainment
Lead	Metal smelters, resource recovery, leaded gasoline, deterioration of lead paint.	Learning disabilities, brain and kidney damage.	Attainment	Attainment
SO_2	Coal or oil burning power plants and industries, refineries, diesel engines.	Increases lung disease and breathing problems for asthmatics. Reacts in the atmosphere to form acid rain.	Attainment	Attainment
Sulfates	Produced by reaction in the air of SO_2, (see SO_2 sources), a component of acid rain.	Breathing difficulties, aggravates asthma, reduced visibility.	(no federal standard)	Attainment
Hydrogen Sulfide	Geothermal power plants, petroleum production and refining, sewer gas.	Nuisance odor (rotten egg smell), headache and breathing difficulties (at higher concentrations).	(no federal standard)	Unclassified

Table 10
Pollutants, Sources, Health Effects, and Attainment Status

Pollutant	Sources	Health Effects	Attainment Status	
			NAAQS	*CAAQS*
Visibility Reducing Particles	See $PM_{2.5}$.	Reduced visibility (e.g., obscures mountains and other scenery), reduced airport safety.	(no federal standard)	Unclassified
Vinyl Chloride	Exhaust gases from factories that manufacture or process vinyl chloride (e.g., construction, packaging, and transportation industries)	Central nervous system effects (e.g., dizziness, drowsiness, headaches), kidney irritation, liver damage, liver cancer.	N/A	N/A
TAC	Combustion engines (stationary and mobile), diesel combustion, storage and use of TAC-containing substances (e.g., gasoline, lead smelting, etc.)	Depends on TAC, but may include cancer, mutagenic and/or teratogenic effects, other acute or chronic health effects.	N/A	N/A

Source: County of San Diego 2007.
O_3 = ozone; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; CO = carbon monoxide; NH_3 = ammonia; NO_2 = nitrogen dioxide; NO_x = nitrous oxide; SO_2 = sulfur dioxide; SO_x = sulfur oxide; TAC = toxic air contaminant; VOC = volatile organic compound.

As indicated in Tables 7 and 8, construction and operation of the project would not result in emissions that exceed the SDAPCD's emission thresholds for any criteria air pollutants. Some VOCs would be associated with motor vehicles and construction equipment, while others would be associated with architectural coatings, the emissions of which would not result in the exceedances of the SDAPCD's thresholds. Generally, the VOCs in architectural coatings are of relatively low toxicity. Additionally, SDAPCD Rule 67.0.1 restricts the VOC content of coatings for both construction and operational applications.

In addition, VOCs and NO_x are precursors to O_3, for which the SDAB is designated as nonattainment with respect to the NAAQS and CAAQS. (The SDAB is designated by the U.S. Environmental Protection Agency as an attainment area for the 1-hour O_3 NAAQS standard and 1997 8-hour NAAQS standard.) The health effects associated with O_3 are generally associated with reduced lung function. The contribution of VOCs and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the SDAB due to O_3 precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. However, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the VOC emissions would occur because exceedances of the O_3 ambient air quality standards tend to occur between April and October when solar radiation is highest. The overall effect of a single project's emissions of O_3 precursors is speculative due to the lack of reliable methods to meaningfully assess this impact. Nonetheless, the VOC and NO_x emissions associated with project construction could minimally contribute to regional O_3

concentrations and the associated health impacts. Due to the minimal contribution during construction and operation, as well as the existing good air quality in coastal San Diego areas, health impacts would be considered **less than significant**.

Similar to O_3, construction of the project would not exceed thresholds for PM_{10} or $PM_{2.5}$ and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter. The project would also not result in substantial diesel particulate matter emissions during construction and operation, and therefore, would not result in significant health effects related to diesel particulate matter exposure. The project would be required to comply with SDAPCD Rule 55, which limits the amount of fugitive dust generated during construction. Due to the minimal contribution of particulate matter during construction and operation, health impacts would be considered **less than significant**.

Regarding NO_2, according to the construction emissions analysis, construction of the proposed project would not contribute to exceedances of the NAAQS and CAAQS for NO_2. NO_2 (which is a constituent of NO_x) health impacts are associated with respiratory irritation, which may be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. However, these operations would be relatively short term and off-road construction equipment would be operating at various portions of the site and would not be concentrated in one portion of the site at any one time. Construction of the project would not require any stationary emission sources that would create substantial, localized NO_2 impacts. Therefore, health impacts would be considered **less than significant**.

The VOC and NO_x emissions, as described previously, would minimally contribute to regional O_3 concentrations and the associated health effects. In addition to O_3, NO_x emissions would not contribute to potential exceedances of the NAAQS and CAAQS for NO_2. CO tends to be a localized impact associated with congested intersections. The associated CO "hotspots" were discussed previously as a less-than-significant impact. Thus, the proposed project's CO emissions would not contribute to significant health effects associated with this pollutant. PM_{10} and $PM_{2.5}$ would not contribute to potential exceedances of the NAAQS and CAAQS for particulate matter, would not obstruct the SDAB from coming into attainment for these pollutants, and would not contribute to significant health effects associated with particulates. Therefore, health impacts associated with criteria air pollutants would be considered **less than significant**.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

2.5.5 Would the project create objectionable odors affecting a substantial number of people?

Odors would be generated from vehicles and/or equipment exhaust emissions during construction of the project. Odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment and architectural coatings. Such odors are temporary and generally occur at magnitudes that would not affect substantial numbers of people. Therefore, impacts associated with odors during construction would be considered **less than significant**.

Land uses and industrial operations associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The project involves residential and recreational uses and would not result in the creation of a land use that is commonly associated with odors. Therefore, project operations would result in an odor impact that is **less than significant**.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

3 GREENHOUSE GAS EMISSIONS

3.1 Environmental Setting

3.1.1 Climate Change Overview

Climate change refers to any significant change in measures of climate—such as temperature, precipitation, or wind patterns—lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in Earth's energy balance, including variations in the sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by Earth's atmosphere (EPA 2017a).

The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short-wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature and creates a pleasant, livable environment on the Earth. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise.

The scientific record of the Earth's climate shows that the climate system varies naturally over a wide range of time scales and that in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes, such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. Recent climate changes, in particular the warming observed over the past century, however, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of warming since the mid-twentieth century and is the most significant driver of observed climate change (IPCC 2014; EPA 2017a). Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming, and improved understanding of the climate system (IPCC 2013). The atmospheric concentrations of GHGs have increased to levels unprecedented in the last 800,000 years, primarily from fossil fuel emissions and secondarily from emissions associated with land use changes (IPCC 2013). Continued emissions of GHGs will cause further warming and changes in all components of the climate system, which is discussed further in Section 3.3.3, Potential Effects of Climate Change.

3.1.2 Greenhouse Gases

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. As defined in California Health and Safety Code Section 38505(g) for purposes of administering many of the state's primary GHG emissions reduction programs, GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride . (See also CEQA Guidelines section 15364.5.)[12] Some GHGs, such as CO_2, CH_4, and N_2O, occur naturally and are emitted into the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases (i.e., HFCs, PFCs, and SF_6), which are associated with certain industrial products and processes. The following paragraphs provide a summary of the most common GHGs and their sources.[13]

Carbon Dioxide. CO_2 is a naturally occurring gas and a by-product of human activities. It is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO_2 include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO_2 include changes in land use and the combustion of fuels such as coal, oil, natural gas, and wood.

Methane. CH_4 is produced through both natural and human activities. CH_4 is a flammable gas and is the main component of natural gas. Sources of CH_4 include anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. N_2O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N_2O. Sources of N_2O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (e.g., nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and using N_2O as a propellant (e.g., in rockets, racecars, and aerosol sprays).

Fluorinated Gases. Fluorinated gases (also referred to as F-gases) are synthetic powerful GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for

[12] Climate forcing substances include GHGs and other substances such as black carbon and aerosols. This discussion focuses on the seven GHGs identified in the California Health and Safety Code 38505 as impacts associated with other climate forcing substances are not evaluated herein.

[13] The descriptions of GHGs are summarized from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (1995), IPCC Fourth Assessment Report (2007), CARB's "Glossary of Terms Used in GHG Inventories" (2015a), and EPA's "Glossary of Climate Change Terms" (2016b).

stratospheric ozone-depleting substances (e.g., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). The most prevalent fluorinated gases include the following:

- **Hydrofluorocarbons:** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals used as alternatives to ozone-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are used in manufacturing.
- **Perfluorocarbons:** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, with HFCs, to ozone-depleting substances. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.
- **Sulfur Hexafluoride:** SF_6 is a colorless gas that is soluble in alcohol and ether and slightly soluble in water. SF_6 is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.
- **Nitrogen Trifluoride:** Nitrogen trifluoride is used in the manufacture of a variety of electronics, including semiconductors and flat panel displays.

3.1.3 Global Warming Potential

Gases in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo) (EPA 2016).

IPCC developed the global warming potential (GWP) concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014). The reference gas used is CO_2; therefore, GWP-weighted emissions are measured in metric tons (MT) of CO_2 equivalent (MT CO_2e).

The CalEEMod Version 2016.3.2 used in this analysis assumes that the GWP for CH4 is 25 (so emissions of 1 MT of CH_4 are equivalent to emissions of 25 MT of CO_2), and the GWP for N_2O is 298, based on the IPCC Fourth Assessment Report (IPCC 2007). The GWP values identified in CalEEMod were applied to the project.

3.2 Regulatory Setting

3.2.1 Federal Regulations

Massachusetts v. EPA. In *Massachusetts v. EPA* (April 2007), the U.S. Supreme Court directed the EPA administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In December 2009, the administrator signed a final rule with the following two distinct findings regarding GHGs under Section 202(a) of the federal Clean Air Act:

- The Administrator found that elevated concentrations of GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations. This is the "endangerment finding."
- The Administrator further found the combined emissions of GHGs—CO_2, CH_4, N_2O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is the "cause or contribute finding."

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act of 2007. The Energy Independence and Security Act of 2007 (December 2007), among other key measures, would do the following, which would aid in the reduction of national GHG emissions (EPA 2007):

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2023.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020. Directs National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products, and procedures for new or amended standards, energy conservation, energy-efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards. In response to the U.S. Supreme Court ruling discussed above, the Bush Administration issued EO 13432 in 2007 directing the EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA

issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011; in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016.

In 2010, President Barack Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards projected to achieve 163 grams per mile of CO_2 in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021. On January 12, 2017, the EPA finalized its decision to maintain the current greenhouse GHG emissions standards for model years 2022–2025 cars and light trucks (EPA 2017b).

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018. The standards for CO_2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6%–23% over the 2010 baselines.

In August 2016, the EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower CO_2 emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

In August 2018, EPA and NHTSA proposed to amend certain fuel economy and GHG standards for passenger cars and light trucks and establish new standards for model years 2021 through 2026. Compared to maintaining the post-2020 standards now in place, the 2018 proposal would increase U.S. fuel consumption by about half a million barrels per day (2–3 % of total daily consumption, according to the Energy Information Administration) and would impact the global climate by 3/1000th of one degree Celsius by 2100 (EPA and NHTSA 2018). California and other states have stated their intent to challenge federal actions that would delay or eliminate GHG reduction measures and have committed to cooperating with other countries to implement global climate change initiatives. Thus, the timing and consequences of the 2018 federal proposal are speculative at this time.

Clean Power Plan and New Source Performance Standards for Electric Generating Units. On October 23, 2015, EPA published a final rule (effective December 22, 2015) establishing the Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (80 FR 64510–64660), also known as the Clean Power Plan. These guidelines prescribe how states must develop plans to reduce GHG emissions from existing fossil-fuel-fired electric generating units. The guidelines establish CO_2 emission performance rates representing the best system of emission reduction for two subcategories of existing fossil-fuel-fired electric generating units: (1) fossil-fuel-fired electric utility steam-generating units, and (2) stationary combustion turbines. Concurrently, the EPA published a final rule (effective October 23, 2015) establishing Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (80 FR 64661–65120). The rule prescribes CO_2 emission standards for newly constructed, modified, and reconstructed affected fossil-fuel-fired electric utility generating units. The U.S. Supreme Court stayed implementation of the Clean Power Plan pending resolution of several lawsuits.

3.2.2 State Regulations

The statewide GHG emissions regulatory framework is summarized below by category: state climate change targets; building energy, renewable energy and energy procurement; mobile sources; solid waste; water; and other state regulations and goals. The following text describes EOs, assembly bills (ABs), SBs, and other regulations and plans that would directly or indirectly reduce GHG emissions.

State Climate Change Targets

The state has taken a number of actions to address climate change. These include EOs, legislation, and CARB plans and requirements. These are summarized below.

EO S-3-05. EO S-3-05 (June 2005) established California's GHG emissions reduction targets and laid out responsibilities among the state agencies for implementing the EO and for reporting on progress toward the targets. This EO established the following targets:

- By 2010, reduce GHG emissions to 2000 levels
- By 2020, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions to 80% below 1990 levels

EO S-3-05 also directed the California Environmental Protection Agency to report biannually on progress made toward meeting the GHG targets and the impacts to California due to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. The Climate Action Team (CAT) was formed, which subsequently issued reports from 2006 to 2010 (CAT 2016).

AB 32. In furtherance of the goals established in EO S-3-05, the Legislature enacted AB 32 (Núñez and Pavley). The bill is referred to as the California Global Warming Solutions Act of 2006 (September 27, 2006). AB 32 provided initial direction on creating a comprehensive multiyear program to limit California's GHG emissions at 1990 levels by 2020 and initiate the transformations required to achieve the state's long-range climate objectives.

SB 32 and AB 197. SB 32 and AB 197 (enacted in 2016) are companion bills. SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, in order to provide ongoing oversight over implementation of the state's climate policies. AB 197 also added two members of the Legislature to the Board as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and TACs from reporting facilities; and, requires CARB to identify specific information for GHG emissions reduction measures when updating the scoping plan.

CARB's 2007 Statewide Limit. In 2007, in accordance with California Health and Safety Code, Section 38550, CARB approved a statewide limit on the GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 MMT CO_2e).

CARB's Climate Change Scoping Plan. One specific requirement of AB 32 is for CARB to prepare a "scoping plan" for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020 (Health and Safety Code, Section 38561(a)), and to update the plan at least once every 5 years. In 2008, CARB approved the first scoping plan. The *Climate Change Scoping Plan: A Framework for Change* (Scoping Plan) included a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the state's long-range climate objectives. The key elements of the Scoping Plan include the following (CARB 2008):

1. Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
2. Achieving a statewide renewable energy mix of 33%
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets

5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (17 CCR 95480 et seq.)
6. Creating targeted fees, including a public goods charge on water use, fees on high-GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation

The Scoping Plan also identified local governments as essential partners in achieving California's goals to reduce GHG emissions because they have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Specifically, the Scoping Plan encouraged local governments to adopt a reduction goal for municipal operations and for community emissions to reduce GHGs by approximately 15% from then levels (2008) by 2020. Many local governments developed community-scale local GHG reduction plans based on this Scoping Plan recommendation.

In 2014, CARB approved the first update to the Scoping Plan. The *First Update to the Climate Change Scoping Plan: Building on the Framework* (First Update) defined the state's GHG emission reduction priorities for the next 5 years and laid the groundwork to start the transition to the post-2020 goals set forth in EOs S-3-05 and B-16-2012. The First Update concluded that California is on track to meet the 2020 target but recommended a 2030 mid-term GHG reduction target be established to ensure a continuum of action to reduce emissions. The First Update recommended a mix of technologies in key economic sectors to reduce emissions through 2050 including: energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies. As part of the First Update, CARB recalculated the state's 1990 emissions level, using more recent global warming potentials identified by the IPCC, from 427 MMT CO_2e to 431 MMT CO_2e (CARB 2014).

In 2015, as directed by EO B-30-15, CARB began working on an update to the Scoping Plan to incorporate the 2030 target of 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050 as set forth in S-3-05. The Governor called on California to pursue a new and ambitious set of strategies, in line with the five climate change pillars from his inaugural address, to reduce GHG emissions and prepare for the unavoidable impacts of climate change. In the summer of 2016, the Legislature affirmed the importance of addressing climate change through passage of SB 32 (Pavley, Chapter 249, Statutes of 2016).

In December 2017, CARB adopted the *2017 Climate Change Scoping Plan Update* (2030 Scoping Plan) (CARB 2017c). The 2030 Scoping Plan builds on the successful framework established in

the initial Scoping Plan and First Update, while identifying new, technologically feasible, and cost-effective strategies that will serve as the framework to achieve the 2030 GHG target and define the state's climate change priorities to 2030 and beyond. The strategies' "known commitments" include implementing renewable energy and energy efficiency (including the mandates of SB 350), increased stringency of the Low Carbon Fuel Standard, measures identified in the Mobile Source and Freight Strategies, measures identified in the proposed Short-Lived Climate Pollutant Plan, and increased stringency of SB 375 targets. To fill the gap in additional reductions needed to achieve the 2030 target, it recommends continuing the Cap-and-Trade Program and a measure to reduce GHGs from refineries by 20%.

For local governments, the 2030 Scoping Plan replaced the initial Scoping Plan's 15% reduction goal with a recommendation to aim for a community-wide goal of no more than 6 MT CO_2e per capita by 2030 and no more than 2 MT CO_2e per capita by 2050, which are consistent with the state's long-term goals. These goals are also consistent with the Global Climate Leadership Memorandum of Understanding (Under 2 MOU) and the Paris Agreement, which are developed around the scientifically based levels necessary to limit global warming below two degrees Celsius. The 2030 Scoping Plan recognized the benefits of local government GHG planning (e.g., through climate action plans (CAPs)) and provide more information regarding tools CARB is working on to support those efforts. It also recognizes the CEQA streamlining provisions for project level review where there is a legally adequate CAP.[14]

The 2030 Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32, SB 32, and EO S-3-05, and establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. A project is considered consistent with the statutes and EOs if it meets the general policies in reducing GHG emissions in order to facilitate the achievement of the state's goals and does not impede attainment of those goals. As discussed in several cases, a given project need not be in perfect conformity with every planning policy or goal to be consistent. Rather, a project would be consistent if it furthers the objectives and does not obstruct their attainment.

CARB's Regulations for the Mandatory Reporting of Greenhouse Gas Emissions. CARB's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (17 CCR 95100–95157) incorporated by reference certain requirements that EPA promulgated in its Final Rule on Mandatory Reporting of Greenhouse Gases (Title 40, Code of Federal Regulations, Part 98). Specifically, Section 95100(c) of the Mandatory Reporting Regulation incorporated those requirements that EPA promulgated in the Federal Register on October 30, 2009; July 12, 2010; September 22, 2010; October

[14] *Sierra Club v. County of Napa* (2004) 121 Cal.App.4th 1490; *San Francisco Tomorrow et al. v. City and County of San Francisco* (2015) 229 Cal.App.4th 498; *San Franciscans Upholding the Downtown Specific Plan v. City & County of San Francisco* (2002) 102 Cal.App.4th 656; *Sequoyah Hills Homeowners Assn. V. City of Oakland* (1993) 23 Cal.App.4th 704, 719.

28, 2010; November 30, 2010; December 17, 2010; and April 25, 2011. In general, entities subject to the Mandatory Reporting Regulation that emit over 10,000 MT CO_2e per year are required to report annual GHGs through the California Electronic GHG Reporting Tool. Certain sectors, such as refineries and cement plants, are required to report regardless of emission levels. Entities that emit more than the 25,000 MT CO_2e per year threshold are required to have their GHG emission report verified by a CARB-accredited third-party verifier.

EO B-18-12. EO B-18-12 (April 2012) directed state agencies, departments, and other entities under the governor's executive authority to take action to reduce entity-wide GHG emissions by at least 10% by 2015 and 20% by 2020, as measured against a 2010 baseline. EO B-18-12 also established goals for existing state buildings for reducing grid-based energy purchases and water use.

EO B-30-15. EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050 as set forth in S-3-05. To facilitate achieving this goal, EO B-30-15 called for CARB to update the 2014 Scoping Plan to express the 2030 target in terms of MMT CO_2e. The EO also called for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets.

SB 605 and SB 1383. SB 605 (2014) requires CARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants (SLCPs) in the state; and SB 1383 (2016) requires CARB to approve and implement that strategy by January 1, 2018. SB 1383 also establishes specific targets for the reduction of SLCPs (40% below 2013 levels by 2030 for CH_4 and HFCs, and 50% below 2013 levels by 2030 for anthropogenic black carbon), and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, and as mentioned above, CARB adopted its *Short-Lived Climate Pollutant Reduction Strategy* (SLCP Reduction Strategy) in March 2017. The SLCP Reduction Strategy establishes a framework for the statewide reduction of emissions of black carbon, methane and fluorinated gases (CARB 2017c).

EO B-55-18. EO B-55-18 (September 2018) establishes a statewide policy for the state to achieve carbon neutrality as soon as possible (no later than 2045), and achieve and maintain net negative emissions thereafter. The goal is an addition to the existing statewide targets of reducing the state's GHG emissions. CARB will work with relevant state agencies to ensure that future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.

Building Energy

Title 24, Part 6. Title 24 of the California Code of Regulations was established in 1978, and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to ensure that new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and the California Energy Commission (CEC), and revised if necessary (Pub. Resources Code, § 25402(b)(1)). The regulations receive input from members of industry, as well as the public, in order to "reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (Pub. Resources Code, § 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (Pub. Resources Code, § 25402(d)) and cost effectiveness (Pub. Resources Code, §§ 25402(b)(2–3)). As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment. The current Title 24 standards are the 2016 Title 24 building energy efficiency standards, which became effective January 1, 2017. The 2019 Title 24 building energy standards become effective January 1, 2020.

Title 24, Part 11. In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as CALGreen, and establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential and state-owned buildings and schools, and hospitals. The CALGreen 2016 standards became effective January 1, 2017. The mandatory standards require the following (24 CCR Part 11):

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings
- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources' Model Water Efficient Landscape Ordinance
- 65% of construction and demolition waste must be diverted from landfills
- Mandatory inspections of energy systems to ensure optimal working efficiency

- Inclusion of electric vehicle charging stations or designated spaces capable of supporting future charging stations
- Low-pollutant emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle boards

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented at the discretion of local agencies and applicants. CALGreen's Tier 1 standards call for a 15% improvement in energy requirements, stricter water conservation, 65% diversion of construction and demolition waste, 10% recycled content in building materials, 20% permeable paving, 20% cement reduction, and cool/solar-reflective roofs. CALGreen's more rigorous Tier 2 standards call for a 30% improvement in energy requirements, stricter water conservation, 80% diversion of construction and demolition waste, 15% recycled content in building materials, 30% permeable paving, 25% cement reduction, and cool/solar-reflective roofs.

The California Building Standards Commission approved amendments to the voluntary measures of the CALGreen standards in December 2018. The 2019 CALGreen standards will become effective January 1, 2020. As with the 2019 Title 24 standards, the 2019 CALGreen standards focus on building energy efficiency.

Title 20. Title 20 of the California Code of Regulations requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. The CEC certifies an appliance based on a manufacturer's demonstration that the appliance meets the standards. New appliances regulated under Title 20 include: refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwashers; clothes washers and dryers; cooking products; electric motors; low voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing each type of appliance covered under the regulations, and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains three types of standards for appliances: (1) federal and state standards for federally regulated appliances, (2) state standards for federally regulated appliances, and (3) state standards for non-federally regulated appliances.

SB 1. SB 1 (Murray) (August 2006) established a $3 billion rebate program to support the goal of the state to install rooftop solar energy systems with a generation capacity of 3,000 megawatts through 2016. SB 1 added sections to the Public Resources Code, including Chapter 8.8 (California Solar Initiative), that require building projects applying for ratepayer-funded incentives for photovoltaic systems to meet minimum energy efficiency levels and performance requirements. Section 25780 established that it is a goal of the state to establish a self-sufficient solar industry. The goals included establishing solar energy systems as a viable mainstream option for both homes

and businesses within 10 years of adoption, and placing solar energy systems on 50% of new homes within 13 years of adoption. SB 1, also termed "Go Solar California," was previously titled "Million Solar Roofs."

California AB 1470 (Solar Water Heating). This bill established the Solar Water Heating and Efficiency Act of 2007. The bill makes findings and declarations of the Legislature relating to the promotion of solar water heating systems and other technologies that reduce natural gas demand. The bill defines several terms for purposes of the act. The bill requires the CPUC to evaluate the data available from a specified pilot program, and, if it makes a specified determination, to design and implement a program of incentives for the installation of 200,000 solar water heating systems in homes and businesses throughout the state by 2017.

Renewable Energy and Energy Procurement

Senate Bill 1078. SB 1078 (Sher) (September 2002) established the Renewable Portfolio Standard program, which required an annual increase in renewable generation by the utilities equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20% of their power from renewable sources by 2010 (see SB 107, EO S-14-08, and S-21-09).

SB 1368. SB 1368 (September 2006), required the CEC to develop and adopt regulations for GHG emission performance standards for the long-term procurement of electricity by local publicly owned utilities. These standards must be consistent with the standards adopted by the CPUC.

AB 1109. Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general-purpose lighting, with the goal of reducing electricity consumption 50% for indoor residential lighting and 25% for indoor commercial lighting.

EO S-14-08. EO S-14-08 (November 2008) focused on the contribution of renewable energy sources to meet the electrical needs of California while reducing the GHG emissions from the electrical sector. This EO required that all retail suppliers of electricity in California serve 33% of their load with renewable energy by 2020. Furthermore, the EO directed state agencies to take appropriate actions to facilitate reaching this target. The CNRA (California Natural Resources Agency), through collaboration with the CEC and California Department of Fish and Wildlife (formerly the California Department of Fish and Game), was directed to lead this effort.

EO S-21-09 and SB X1-2. EO S-21-09 (September 2009) directed CARB to adopt a regulation consistent with the goal of EO S-14-08 by July 31, 2010. CARB was further directed to work with the CPUC and CEC to ensure that the regulation builds upon the Renewable Portfolio Standard program and was applicable to investor-owned utilities, publicly owned utilities, direct access providers, and community choice providers. Under this order, CARB was to give the highest

priority to those renewable resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health and can be developed the most quickly in support of reliable, efficient, cost-effective electricity system operations. On September 23, 2010, CARB initially approved regulations to implement a Renewable Electricity Standard. However, this regulation was not finalized because of subsequent legislation (SB X1-2, Simitian, statutes of 2011) signed by Governor Brown in April 2011.

SB X1-2 expanded the Renewable Portfolio Standard by establishing a renewable energy target of 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% by December 31, 2020, and in subsequent years. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation (i.e., 30 megawatts or less), digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location.

SB X1-2 applies to all electricity retailers in the state including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must meet the renewable energy goals listed above.

SB 350. SB 350 (October 2015) further expanded the Renewable Portfolio Standard by establishing a goal of 50% of the total electricity sold to retail customers in California per year by December 31, 2030. In addition, SB 350 included the goal to double the energy efficiency savings in electricity and natural gas final end uses (e.g., heating, cooling, lighting, or class of energy uses on which an energy-efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal.

SB 100. SB 100 (2018) increased the standards set forth in SB 350, establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030, be secured from qualifying renewable energy sources. SB 100 states that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100% of the retail sales of electricity to California. This bill requires that the achievement of 100% zero-carbon electricity resources do not increase the carbon emissions elsewhere in the western grid and that the achievement not be achieved through resource shuffling.

Mobile Sources

AB 1493. AB 1493 (Pavley) (July 2002) was enacted in a response to the transportation sector accounting for more than half of California's CO_2 emissions. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the

state board to be vehicles that are primarily used for noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. When fully phased in, the near-term (2009–2012) standards will result in a reduction of about 22% in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards will result in a reduction of about 30%.

Heavy Duty Diesel. CARB adopted the final Heavy Duty Truck and Bus Regulation, Title 13, Division 3, Chapter 1, Section 2025, on December 31, 2014 to reduce particulate matter and NO_x emissions from heavy-duty diesel vehicles. The rule requires particulate matter filters be applied to newer heavy-duty trucks and buses by January 1, 2012, with older vehicles required to comply by January 1, 2015. The rule will require nearly all diesel trucks and buses to be compliant with the 2010 model year engine requirement by January 1, 2023. CARB also adopted an Airborne Toxic Control Measure to limit idling of diesel-fueled commercial vehicles on December 12, 2013. This rule requires diesel-fueled vehicles with gross vehicle weights greater than 10,000 pounds to idle no more than 5 minutes at any location (13 CCR 2485).

EO S-1-07. EO S-1-07 (January 2007, implementing regulation adopted in April 2009) sets a declining Low Carbon Fuel Standard for GHG emissions measured in CO_2e grams per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020 (17 CCR 95480 et seq.). The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel—including extraction/feedstock production, processing, transportation, and final consumption—per unit of energy delivered.

SB 375. SB 375 (Steinberg) (September 2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 requires CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035 and to update those targets every 8 years. SB 375 requires the state's 18 regional MPOs to prepare a SCS as part of their Regional Transportation Plan (RTP) that will achieve the GHG reduction targets set by CARB. If an MPO is unable to devise an SCS to achieve the GHG reduction target, the MPO must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to Government Code, Section 65080(b)(2)(K), an SCS does not: (i) regulate the use of land; (ii) supersede the land use authority of cities and counties; or (iii) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those

strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

In 2010, CARB adopted the SB 375 targets for the regional MPOs. SANDAG has targets of a 7% reduction in emissions per capita by 2020, and a 13% reduction by 2035. SANDAG completed and adopted its *2050 Regional Transportation Plan/Sustainable Communities Strategy* (2050 RTP/SCS) in October 2011. In November 2011, CARB, by resolution, accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the SCS would achieve CARB's 2020 and 2035 GHG emissions reduction targets for the region.

After SANDAG's 2050 RTP/SCS was adopted, a lawsuit was filed by the Cleveland National Forest Foundation and others. The case was resolved and decided upon in July 2017 by the California Supreme Court; the court found that SANDAG's environmental impact report did not have to use EO S-3-05's 2050 goal of an 80% reduction in GHG emissions from 1990 levels as a significance threshold because the environmental impact report sufficiently informed the public of the potential impacts. Although the environmental impact report for SANDAG's 2050 RTP/SCS was pending before the California Supreme Court, in 2015, SANDAG adopted the next iteration of its RTP/SCS in accordance with statutorily mandated timelines and no subsequent litigation challenge was filed. More specifically, in October 2015, SANDAG adopted *San Diego Forward: The Regional Plan*. Like the 2050 RTP/SCS, this planning document meets CARB's 2020 and 2035 reduction targets for the region (SANDAG 2015). In December 2015, CARB, by resolution, accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the SCS would achieve CARB's 2020 and 2035 GHG emissions reduction targets for the region.

Advanced Clean Cars Program and Zero-Emissions Vehicle Program. The Advanced Clean Cars program (January 2012) is a new emissions-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single coordinated package. The package includes elements to reduce smog-forming pollution and GHG emissions, promote clean cars, and provide the fuels for clean cars (CARB 2011b). To improve air quality, CARB has implemented new emission standards to reduce smog-forming emissions beginning with 2015 model year vehicles. It is estimated that in 2025, cars will emit 75% less smog-forming pollution than the average new car sold today. To reduce GHG emissions, CARB, in conjunction with the EPA and the NHTSA, adopted new GHG standards for model year 2017 to 2025 vehicles; the new standards are estimated to reduce GHG emissions by 34% in 2025. The Zero Emission Vehicle program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of Zero Emission Vehicles and plug-in hybrid electric vehicles in the 2018 to 2025 model years.

EO B-16-12. EO B-16-12 (March 2012) required that state entities under the governor's direction and control support and facilitate the rapid commercialization of Zero Emission Vehicles. It ordered CARB, CEC, CPUC, and other relevant agencies to work with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to help achieve established goals by 2015, 2020, and 2025. On a statewide basis, EO B-16-12 established a target reduction of GHG emissions from the transportation sector equaling 80% less than 1990 levels by 2050. This directive did not apply to vehicles that have special performance requirements necessary for the protection of the public safety and welfare.

AB 1236. AB 1236 (October 2015) (Chiu) required a city, county, or city and county to approve an application for the installation of electric vehicle charging stations, as defined, through the issuance of specified permits unless the city or county makes specified written findings based upon substantial evidence in the record that the proposed installation would have a specific, adverse impact upon the public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. The bill provided for appeal of that decision to the planning commission, as specified. The bill provided that the implementation of consistent statewide standards to achieve the timely and cost-effective installation of electric vehicle charging stations is a matter of statewide concern. The bill required electric vehicle charging stations to meet specified standards. The bill required a city, county, or city and county with a population of 200,000 or more residents to adopt an ordinance, by September 30, 2016, that created an expedited and streamlined permitting process for electric vehicle charging stations, as specified. The bill also required a city, county, or city and county with a population of less than 200,000 residents to adopt this ordinance by September 30, 2017.

Water

EO B-29-15. In response to the ongoing drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25% relative to water use in 2013. The term of the EO extended through February 28, 2016, although many of the directives have become permanent water-efficiency standards and requirements. The EO includes specific directives that set strict limits on water usage in the state. In response to EO B-29-15, the California Department of Water Resources has modified and adopted a revised version of the Model Water Efficient Landscape Ordinance that, among other changes, significantly increases the requirements for landscape water use efficiency and broadens its applicability to include new development projects with smaller landscape areas.

EO B-37-16. Issued May 2016, EO B-37-16 directs the State Water Resources Control Board (Water Board) to adjust emergency water conservation regulations through the end of January 2017 to reflect differing water supply conditions across the state. The Water Board must also develop a proposal to achieve a mandatory reduction of potable urban water usage that builds off

the mandatory 25% reduction called for in EO B-29-15. The Water Board and Department of Water Resources will develop new, permanent water use targets that build upon the existing state law requirements that the state achieve 20% reduction in urban water usage by 2020. EO B-37-16 also specifies that the Water Board will permanently prohibit water-wasting practices such as hosing off sidewalks, driveways, and other hardscapes; washing automobiles with hoses not equipped with a shut-off nozzle; using non-recirculated water in a fountain or other decorative water feature; watering lawns in a manner that causes runoff, or within 48 hours after measurable precipitation; and irrigating ornamental turf on public street medians.

EO B-40-17. EO B-40-17 (April 2017) lifted the drought emergency in all California counties except Fresno, Kings, Tulare, and Tuolumne. It also rescinds EO B-29-15, but expressly states that EO B-37-16 remains in effect and directs the Water Board to continue development of permanent prohibitions on wasteful water use.

Solid Waste

AB 939 and AB 341. In 1989, AB 939, known as the Integrated Waste Management Act (California Public Resources Code, Sections 40000 et seq.), was passed because of the increase in waste stream and the decrease in landfill capacity. The statute established the California Integrated Waste Management Board, which oversees a disposal reporting system. AB 939 mandated a reduction of waste being disposed where jurisdictions were required to meet diversion goals of all solid waste through source reduction, recycling, and composting activities of 25% by 1995 and 50% by the year 2000.

AB 341 (Chapter 476, Statutes of 2011 (Chesbro)) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75% of solid waste generated be source-reduced, recycled, or composted by the year 2020, and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery (CalRecycle) to develop strategies to achieve the state's policy goal. CalRecycle conducted several general stakeholder workshops and several focused workshops; in August 2015, it published a discussion document titled AB 341 Report to the Legislature, which identifies five priority strategies that CalRecycle believes would assist the state in reaching the 75% goal by 2020, legislative and regulatory recommendations, and an evaluation of program effectiveness (CalRecycle 2017).

Other State Actions

SB 97. SB 97 (Dutton) (August 2007) directed the Governor's Office of Planning and Research to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, the Governor's Office of Planning and Research issued a technical advisory as interim guidance regarding the analysis of

GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities (OPR 2008). The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant. The CNRA adopted the CEQA Guidelines amendments in December 2009, which became effective in March 2010.

Under the amended Guidelines, a lead agency has the discretion to determine whether to use a quantitative or qualitative analysis or apply performance standards to determine the significance of GHG emissions resulting from a particular project (14 CCR 15064.4(a)). The Guidelines require a lead agency to consider the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)). The Guidelines also allow a lead agency to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through the implementation of project features or off-site measures. The adopted amendments do not establish a GHG emission threshold, instead allowing a Lead Agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts. The CNRA also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions (CNRA 2009a).

With respect to GHG emissions, the CEQA Guidelines state in Section 15064.4(a) that lead agencies should "make a good faith effort, to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions. The CEQA Guidelines note that an agency may identify emissions by either selecting a "model or methodology" to quantify the emissions or by relying on "qualitative analysis or other performance based standards" (14 CCR 15064.4(a)). Section 15064.4(b) states that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment: (1) the extent a project may increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)).

EO S-13-08. EO S-13-08 (November 2008) is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. Therefore, the EO directs state agencies to take specified actions to assess and plan for such impacts. The final *2009 California Climate Adaptation Strategy* report was issued in December 2009 (CNRA 2009b), and an update, *Safeguarding California: Reducing Climate Risk*, followed in July 2014 (CNRA 2014). To assess the state's vulnerability, the report summarizes key climate change impacts to the state for the

following areas: Agriculture, Biodiversity and Habitat, Emergency Management, Energy, Forestry, Ocean and Coastal Ecosystems and Resources, Public Health, Transportation, and Water. Issuance of the *Safeguarding California: Implementation Action Plans* followed in March 2016 (CNRA 2016). In January 2018, the CNRA released the *Safeguarding California Plan: 2018 Update,* which communicates current and needed actions that state government should take to build climate change resiliency (CNRA 2018).

3.2.3 Local Regulations

3.2.3.1 San Diego Air Pollution Control District

SDAPCD does not have established GHG rules, regulations, or policies.

3.2.3.2 San Diego Association of Governments

On October 28, 2011, the SANDAG Board of Directors adopted the 2050 RTP/SCS, which articulates future plans for San Diego's regional transportation system over the next 40 years. The SCS, which is included as part of the RTP, details the regional strategy for reducing GHG emissions to state-mandated levels over time as required by SB 375, including measures encouraging infill development. The San Diego region is the first in California to produce an RTP with a SCS.

SANDAG prepared *San Diego Forward: The Regional Plan*, which has united two of SANDAG's major planning efforts into one with the next update of the RTP/SCS and an update of the Regional Comprehensive Plan that was adopted in 2004. The updated RTP/SCS was adopted by the SANDAG Board of Directors on October 9, 2015.

3.2.3.3 City of Del Mar

On June 6, 2016, the City adopted its CAP to reduce GHG emissions within the City in order to meet the State of California's goal as recommended in the AB 32 Scoping Plan of reducing GHG emissions to 1990 levels by 2020 (City of Del Mar 2016). It should be noted, however, that the City's CAP is not a certified GHG reduction plan and has not undergone CEQA review. The CAP states that it is an "aspirational document" and is not considered part of the City's General Plan or part of a regulatory program, therefore, information provided herein is provided for informational purposes. Reduction measures included in the CAP will undergo environmental review prior to implementation as necessary.

The CAP provides an update to the City's 2005 GHG inventory and provides GHG inventory projections for business-as-usual and "adjusted" 2020 and 2035, which includes reductions from federal and state regulatory measures. In 2012, the City's communitywide GHG

emissions totaled 55,855 MT CO_2e. In order to meet the state's long-term goal, the City would have to reduce its GHG emissions by 15% in 2020 to 47,477 MT CO_2e and 50% by 2035 to 27,928 MT CO_2e. As indicated in the CAP, the City's business-as-usual GHG emissions would be 54,822 MT CO_2e in 2020 and 55,314 MT CO_2e in 2035. With reductions, the City is projected to emit 46,028 MT CO_2e in 2020 and 43,048 MT CO_2e in 2035. Thus, the City would need to reduce 15,120 MT CO_2e emissions below the adjusted business-as-usual scenario in 2035 to meet the state-aligned target.

Reduction measures included in the CAP detail how the City can meet the GHG emissions target through implementation of goals, measures, and strategies. Each goal contains one or more proposed policies, programs, or projects indicating the City's commitment toward meeting the goal. The GHG reduction potential by 2020 and 2035 are identified for each goal. Goals are further divided into one or more discrete strategies that the City may take in achieving the goal. Strategies may be added or removed over time, depending on their relevancy, funding availability, and whether the strategies are successful in supporting measures as they are monitored over time. Each measure includes co-benefits that cover areas such as energy efficiency, water conservation, improved air quality, renewable energy and transportation.

3.3 Greenhouse Gas Inventories and Climate Change Conditions

3.3.1 Sources of Greenhouse Gas Emissions

Per the 2019 U.S. Environmental Protection Agency (EPA) Inventory of U.S. GHG Emissions and Sinks: 1990–2017, total U.S. GHG emissions were approximately 6,457 million metric tons (MMT) CO_2e in 2017 (EPA 2019b). The primary GHG emitted by human activities in the United States was CO_2, which represented approximately 81.6% of total GHG emissions (6,457 MMT CO_2e). The largest source of CO_2, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.2% of CO_2 emissions in 2017 (4,912.0 MMT CO_2e). Relative to the 1990 emissions level, gross U.S. GHG emissions in 2017 are 1.3% higher; however, the gross emissions are down from a high of 15.7% above the 1990 level that occurred in 2007. GHG emissions decreased from 2016 to 2017 by 0.5% (35.5 MMT CO_2e) and, overall, net emissions in 2017 were 13% below 2005 levels (EPA 2019b).

According to California's 2000–2017 GHG emissions inventory (2019 edition), California emitted 424.09 MMT CO_2e in 2017, including emissions resulting from out-of-state electrical generation (CARB 2019g). The sources of GHG emissions in California include transportation, industrial uses, electric power production from both in-state and out-of-state sources, commercial and residential uses, agriculture, high global-warming potential substances, and recycling and waste. Table 11 presents California GHG emission source categories (as defined in CARB's 2008 Scoping Plan) and their relative contributions in 2017.

Table 11
Greenhouse Gas Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO_2e)	Percent of Total[a]
Transportation	169.86	40%
Industrial uses[b]	89.40	21%
Electricity generation	62.39	15%
Residential and commercial uses	41.14	10%
Agriculture	32.42	8%
High global-warming potential substances	19.99	5%
Recycling and waste	8.89	2%
Totals	**424.09**	**100%**

Source: CARB 2019g.
Notes: Emissions reflect the 2017 California GHG inventory.
MMT CO_2e = million metric tons of carbon dioxide equivalent per year
[a] Percentage of total has been rounded and total may not sum due to rounding.
[c] Includes emissions associated with imported electricity, which account for 23.94 MMT CO_2e.

Between 2000 and 2017, per capita GHG emissions in California have dropped from a peak of 14.1 MT per person in 2001 to 10.7 MT per person in 2017, representing a 24% decrease. In addition, total GHG emissions in 2017 were approximately 5 MMT CO_2e less than 2016 emissions. The declining trend in GHG emissions, coupled with programs that will continue to provide additional GHG reductions going forward, demonstrates that California will continue to reduce emissions below the 2020 target of 431 MT CO_2e (CARB 2019g).

In 2012, which was the baseline inventory year for the CAP, the city-wide GHG emissions were 55,855 MT CO_2e. The transportation sector accounted for 54% of emissions, which represents the majority of emissions. The Residential sector contributed approximately 21%, producing 11,518 MT CO_2e. The Commercial, Industrial, and Lighting Energy sector contributed about 15% of the City's emissions, producing 8,243 MTCO2e. Waste and Water sectors contributed 6% and 3% of emissions, respectively, and the remaining Wastewater sector accounted for less than 1% of total emissions (City of Del Mar 2016).

3.3.2 Carbon Sequestration

Carbon sequestration is the process by which CO_2 is removed from the atmosphere and deposited into a carbon reservoir (e.g., vegetation). Trees and vegetation take in CO_2 from the atmosphere during photosynthesis, break down the CO_2, store the carbon within plant parts, and release the oxygen back into the atmosphere (CARB 2015a). A development that changes land use type results in potential release of sequestered carbon to the atmosphere as CO_2, which would not have been released had there been no land-type change. The planting of new trees and vegetation would store new carbon as their wood mass increases via normal growth. This GHG analysis estimates the loss of sequestered carbon associated with the proposed land use change and the gain of sequestered carbon associated with planting new trees.

3.3.3 Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The IPCC's 2014 *Climate Change 2014: Synthesis Report* indicated that warming of the climate system is unequivocal and, since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, and rising sea levels (IPCC 2014).

In California, climate change impacts have the potential to affect sea level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, and electricity demand and supply (CCCC 2006). The primary effect of global climate change has been a 0.2°C rise in average global tropospheric temperature per decade, determined from meteorological measurements worldwide between 1990 and 2005. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming could be taking place.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The average temperatures in California have increased, leading to more extreme hot days and fewer cold nights; shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year; sea levels have risen; and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

An increase in annual average temperature is a reasonably foreseeable effect of climate change. Observed changes over the last several decades across the western United States reveal clear signals of climate change. Statewide average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been greatest in the Sierra Nevada (CCCC 2012). By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1°F to 8.6°F, depending on emissions levels. Springtime warming—a critical influence on snowmelt—will be particularly pronounced. Summer temperatures will rise more than winter temperatures, and the increases will be greater in inland California, compared to the coast. Heat waves will be more frequent, hotter, and longer. There will be fewer extremely cold nights (CCCC 2012). A decline of Sierra snowpack, which accounts for approximately half of the surface water storage in California and much of the state's water supply, by 30% to as much as 90% is predicted over the next 100 years (CAT 2006).

Model projections for precipitation over California continue to show the Mediterranean pattern of wet winters and dry summers with seasonal, year-to-year, and decade-to-decade variability. For the first time, however, several of the improved climate models shift toward drier conditions by the mid-to-late twenty-first century in Central and, most notably, Southern California. By late-century, all projections show drying, and half of them suggest 30-year average precipitation will decline by more than 10% below the historical average (CCCC 2012).

Wildfire risk in California will increase as a result of climate change. Earlier snowmelt, higher temperatures, and longer dry periods over a longer fire season will directly increase wildfire risk. Indirectly, wildfire risk will also be influenced by potential climate-related changes in vegetation and ignition potential from lightning. However, human activities will continue to be the biggest factor in ignition risk. It is estimated that the long-term increase in fire occurrence associated with a higher emissions scenario is substantial, with increases in the number of large fires statewide ranging from 58% to 128% above historical levels by 2085. Under the same emissions scenario, estimated burned area will increase by 57% to 169%, depending on location (CCCC 2012).

Reduction in the suitability of agricultural lands in the state for traditional crop types may occur. While effects may occur, adaptation could allow farmers and ranchers to minimize potential negative effects on agricultural outcomes through adjusting timing of plantings or harvesting and changing crop types.

Public health-related effects of increased temperatures and prolonged temperature extremes—including heat stroke, heat exhaustion, and exacerbation of existing medical conditions—could be particular problems for the elderly, infants, and those who lack access to air conditioning or cooled spaces (CNRA 2009a).

A summary of current and future climate change impacts to resource areas in California, as discussed in CNRA's *Safeguarding California: Reducing Climate Risk* (CNRA 2014) is provided below.

Agriculture. The impacts of climate change on the agricultural sector are far more severe than the typical variability in weather and precipitation patterns that occur year to year. The agriculture sector and farmers face some specific challenges that include more drastic and unpredictable precipitation and weather patterns; extreme weather events that range from severe flooding to extreme drought, to destructive storm events; significant shifts in water availably and water quality; changes in pollinator lifecycles; temperature fluctuations, including extreme heat stress and decreased chill hours; increased risks from invasive species and weeds, agricultural pests and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production. These challenges and associated short-term and long-term impacts can have both positive and negative effects on agricultural production. Nonetheless, it is predicted that current crop and livestock production will suffer long-term negative effects resulting in a substantial decrease in the agricultural sector if not managed or mitigated.

Biodiversity and Habitat. The state's extensive biodiversity stems from its varied climate and assorted landscapes, which have resulted in numerous habitats where species have evolved and adapted over time. Specific climate change challenges to biodiversity and habitat include species migration in response to climatic changes, range shift, and novel combinations of species; pathogens, parasites, and disease; invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; and threshold effects (i.e., a change in the ecosystem that results in a "tipping point" beyond which irreversible damage or loss occurs). Habitat restoration, conservation, and resource management across California and through collaborative efforts among public, private, and nonprofit agencies has assisted in the effort to fight climate change impacts on biodiversity and habitat. One of the key measures in these efforts is ensuring species' ability to relocate as temperature and water availability fluctuate due to climate change, based on geographic region.

Energy. The energy sector provides California residents with a supply of reliable and affordable energy through a complex integrated system. Specific climate change challenges for the energy sector include temperature, fluctuating precipitation patterns, increasing extreme weather events and sea-level rise. Increasing temperatures and reduced snowpack negatively impact the availability of a steady flow of snowmelt to hydroelectric reservoirs. Higher temperatures also reduce the capacity of thermal power plants because power plant cooling is less efficient at higher ambient temperatures. Increased temperatures will also increase electricity demand associated with air conditioning. Natural gas infrastructure in coastal California is threatened by sea-level rise and extreme storm events.

Forestry. Forests occupy approximately 33% of California's 100 million acres and provide key benefits such as wildlife habitat, absorption of carbon dioxide, renewable energy and building materials. The most significant risks to forests related to climate change is accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large-scale mortalities and combined with increasing temperatures have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts and vegetation conversions. These factors contribute to decreased forest growth, geographic shifts in tree distribution, loss of fish and wildlife habitat, and decreased carbon absorption. Climate change may result in increased establishment of non-native species, particularly in rangelands where invasive species are already a problem. Invasive species may be able to exploit temperature or precipitation changes, or quickly occupy areas denuded by fire, insect mortality or other climate change effects on vegetation.

Ocean and Coastal Ecosystems and Resources. Sea-level rise, changing ocean conditions, and other climate change stressors are likely to exacerbate long-standing challenges related to ocean and coastal ecosystems, in addition to threatening people and infrastructure located along the

California coastline and in coastal communities. Sea level rise, in addition to more frequent and severe coastal storms and erosion, are threatening vital infrastructure such as roads, bridges, power plants, ports and airports, gasoline pipes, and emergency facilities. Coastal recreational assets, such as beaches and tidal wetlands, are also being negatively affected. Water quality and ocean acidification threaten the abundance of seafood and other plant and wildlife habitats throughout California and globally.

Public Health. Climate change can impact public health through various environmental changes and is the largest threat to human health in the twenty-first century. Changes in precipitation patterns affect public health primarily through potential for altered water supplies, as well as extreme events such as heat, floods, droughts, and wildfires. Increased frequency, intensity, and duration of extreme heat and heat waves is likely to increase the risk of mortality due to heat-related illness and exacerbation of existing chronic health conditions. Other extreme weather events are likely to negatively affect air quality and increase or intensify respiratory illness (e.g., asthma and allergies). Additional health impacts that may be impacted by climate change include cardiovascular disease, vector-borne diseases, mental health impacts, and malnutrition injuries. Increased frequency of these ailments is likely to subsequently increase the direct risk of injury and/or mortality.

Transportation. Residents of California rely on airports, seaports, public transportation, and an extensive roadway network to gain access to destinations, goods, and services. While the transportation industry is a source of GHG emissions, it is also vulnerable to climate change risks. Particularly, sea-level rise and erosion threaten many coastal California roadways, airports, seaports, transit systems, bridge supports, and energy and fueling infrastructure. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. High temperatures cause the road surfaces to expand, which leads to increased pressure and pavement buckling. High temperatures can also cause rail breakages that could lead to train derailment. Other forms of extreme weather events, such as extreme storm events, can negatively impact infrastructure, which can impair movement of peoples and goods, or potentially block evacuation routes and emergency access roads. Increased wildfires, flooding, erosion risks, landslides, mudslides, and rockslides can all profoundly impact the transportation system and pose a serious risk to public safety.

Water. Water resources in California support residences, plants, wildlife, farmland, landscapes, and ecosystems, and bring trillions of dollars in economic activity. Climate change could seriously impact the timing, form, amount of precipitation, runoff patterns, and frequency and severity of precipitation events. Higher temperatures reduce the amount of snowpack and lead to earlier snowmelt, which can affect water supply availability, natural ecosystems, and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated during the winter. Increased risk of flooding is associated with a variety of public health concerns including water quality,

public safety, property damage, displacement, and post-disaster mental health problems. Prolonged and intensified droughts can also negatively affect groundwater reserves and result in increased overdraft and subsidence. Droughts can also negatively impact agriculture and farmland throughout the state. The higher risk of wildfires can lead to increased erosion, which can negatively impact watersheds and result in poor water quality. Water temperatures are also prone to increase, which can negatively affect wildlife that rely on a specific range of temperatures for suitable habitat.

In March 2016, CNRA released Safeguarding California: Implementation Action Plans, a document that shows how California is acting to convert the recommendations contained in the 2014 Safeguarding California plan into action (CNRA 2016). Additionally, in May 2017, CNRA released the draft Safeguarding California Plan: 2017 Update, which is a survey of current programmatic responses for climate change and contains recommendations for further actions (CNRA 2017).

CNRA released *Safeguarding California Plan: 2018 Update* in January 2018, which provides a roadmap for state agencies to protect communities, infrastructure, services, and the natural environment from climate change impacts. The 2018 Safeguarding California Plan includes 69 recommendations across 11 sectors and more than 1,000 ongoing actions and next steps developed by scientific and policy experts across 38 state agencies (CNRA 2018). As with previous state adaptation plans, the 2018 Update addresses the following: acceleration of warming across the state; more intense and frequent heat waves; greater riverine flows; accelerating sea level rise; more intense and frequent drought; more severe and frequent wildfires; more severe storms and extreme weather events; shrinking snowpack and less overall precipitation; and ocean acidification, hypoxia, and warming.

3.4 Significance Criteria and Methodology

3.4.1 Thresholds of Significance

The significance criteria used to evaluate the project's GHG emissions impacts are based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this GHG emissions analysis, the project would have a significant environmental impact if it would (14 CCR 15000 et seq.):

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.

Neither the State of California nor SDAPCD has adopted emission-based thresholds of significance for GHG emissions under CEQA.

For purposes of GHG significance criterion 1 from Appendix G, the project's GHG emissions are assessed by evaluating the project's consistency with the City's CAP, as well as the project's potential to exceed a City-specific efficiency metric threshold (i.e., service population threshold) for 2023. The efficiency metric threshold developed for the purposes of this GHG emissions analysis is discussed below in detail.

For purposes of GHG significance criterion 2 from Appendix G, the project is assessed based on its potential to conflict with the City's CAP, SANDAG's Regional Plan, and CARB's Scoping Plan, including the Final 2030 Scoping Plan. The project's potential to conflict with the SANDAG Regional Plan and CARB's Scoping Plan goals and measures are analyzed as part of the consistency analysis.

City-Specific Efficiency Metric

The City's CAP is not a qualified CAP under CEQA Section 15183.5, and does not include project-level screening or significance threshold. The CAP does include community-wide emissions levels for the years 2020 and 2035 consistent with state goals, and therefore, an efficiency metric can be calculated to interpolate a per service population per year GHG levels consistent with the CAP for the years between the two benchmarks.

An efficiency metric is calculated by dividing the allowable GHG emissions inventory in a selected calendar year by the service population (residents plus employees), which then leads to the identification of a quantity of emissions that can be permitted on a per service population basis without significantly impacting the environment. This approach is appropriate for the project because it measures the project's emissions on a per service population basis to determine its overall GHG efficiency relative to regulatory GHG reduction goals, as opposed to applying a relatively arbitrary threshold limit that may not be well substantiated. Under the efficiency metric, the project's GHG emissions are evaluated herein relative to the emissions level in the project's build-out year and the build-out year's associated efficiency metric. To that end, an efficiency metric was calculated based on the 2023 emissions level (year of project build-out) and the project's service population (sum of number of employees and the number of estimated hotel guests provided by the project).

As there are no emissions, employment, or population data specific to the project's build-out year (2023), an efficiency metric was generated for year 2023 by interpolating the efficiency metrics for years 2020 and 2035. As illustrated below, the CAP's emission reduction targets for 2020 and 2035 were used to calculate a linear trend line and emissions targets for each interim year. To develop a service population, SANDAG Series 13 Regional Growth Forecast was used to estimate

employment, consistent with the residential population projections in the CAP. A linear trend was then calculated for population in the interim years. Finally, a per service population per year emissions level was generated by dividing the interpolated emissions by the corresponding forecasted service population.

To assess consistent with state goals, an efficiency metric was calculated using the 2030 Scoping Plan. To generate the statewide consistency threshold, the 2020 baseline interpolated to the project's build-out year, using the 5.2% rate of average annual decline identified by CARB as necessary to achievement of SB 32's 2030 reduction target (40% below 1990 levels) and EO S-3-05's 2050 reduction target (80% below 1990 levels) (CARB 2015b).

The efficiency metric for 2020, 2035, and the interpolation for 2023 are illustrated below in Table 12. If the project achieves the 2023 efficiency metric, the project would not interfere with the State of California's ability to achieve the mid-term and long-term GHG reduction targets per SB 32 and EO S-3-05.

Table 12
2020 and 2035 Calculated Efficiency Metric

	Population	Employment	Service Population (Population + Employment)	Emissions (MT CO_2e)	Efficiency Metric (MT/SP/yr)
2020 Efficiency Metric	4,399	4,543	8,941	47,477	5.31
2035 Efficiency Metric – City of Del Mar CAP	4,672	4,704	9,376	27,928	2.98
2035 Efficiency Metric – CARB Annual Reduction	4,672	4,704	9,376	21,311	2.27

Sources: SANDAG 2050 Regional Growth Forecast, Series 13 (SANDAG 2013).
City of Del Mar Climate Action Plan (City of Del Mar 2016)
Notes: CAP = Climate Action Plan; CARB = California Air Resources Board; CO_2e = carbon dioxide equivalent; MT = metric ton; SP = service population; yr = year. Refer to Appendix D for detailed Calculations

As shown in Table 12, the 2035 emissions from the CAP are higher than that calculated using the CARB's Scoping Plan emissions trajectory. The calculated efficiency metric for 2023 using both CARB's Scoping Plan and the CAP are shown in Table 13.

Table 13
2023 Interpolated Efficiency Metric

	2020 Efficiency Metric (MT/SP/yr)	2035 Efficiency Metric (MT/SP/yr)	2023 Efficiency Metric (MT/SP/yr)
Efficiency Metric – City of Del Mar CAP	5.31	2.98	4.83
Efficiency Metric – CARB Annual Reduction	5.31	2.27	4.48

Sources: SANDAG 2050 Regional Growth Forecast, Series 13 (SANDAG 2013).

City of Del Mar Climate Action Plan (City of Del Mar 2016)
Notes: CARB = California Air Resources Board; CAP = Climate Action Plan; MT = metric ton; SP = service population; yr = year

As shown in Table 13, the calculated efficiency metric for 2023 based on the CARB Scoping Plan projected emissions trajectory was 4.48 MT per service population per year. In contrast, when using the same 2020 efficiency metric but using the CAP emissions projection for 2035, the efficiency metric is 4.83 MT per service population per year. The CARB based efficiency metric is thus a more conservative significance threshold and is used further in this report.

Again, this 2023 efficiency metric reflects the trajectory planned in the State of California's Scoping Plan. If the project achieves the 2023 efficiency metric, it would not interfere with attainment of the 2030 and 2050 statewide emission reduction targets, and therefore not interfere with the state's and the City's ability to achieve the mid-term and long-term GHG reduction targets in the City's CAP.

3.4.2 Approach and Methodology

3.4.2.1 Construction

CalEEMod Version 2016.3.2 was used to estimate potential project-generated GHG emissions during construction. Construction of the project would result in GHG emissions primarily associated with use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. All details for construction criteria air pollutants discussed in Section 2.4.2.1, Construction, are also applicable for the estimation of construction-related GHG emissions. As such, see Section 2.4.2.1 for a discussion of construction emissions calculation methodology and assumptions.

3.4.2.2 Operation

CalEEMod Version 2016.3.2 was used to estimate potential project-generated operational GHG emissions from area sources (landscape maintenance), energy sources (natural gas and electricity), mobile sources, solid waste, and water supply and wastewater treatment. Emissions from each category are discussed in the following text with respect to the project. For additional details, see Section 2.4.2.2, Operation, for a discussion of operational emission calculation methodology and assumptions, specifically for area, energy (natural gas), and mobile sources. Operational year 2023 was assumed consistent with the project's construction schedule.

Area Sources

CalEEMod was used to estimate GHG emissions from the project's area sources, which include operation of gasoline-powered landscape maintenance equipment that produce minimal GHG emissions. See Section 2.4.2.2, for a discussion of landscaping equipment emissions calculations.

Consumer product use and architectural coatings result in VOC emissions, which are analyzed in air quality analysis only, and little to no GHG emissions.

Energy Sources

Project–specific energy (electricity and natural gas) use data was used in place of CalEEMod default values (Glumac 2019). To calculate the building energy input (i.e., electricity and natural gas use from regulated and unregulated loads), project–specific energy use data prepared by Glumac which reflected energy use in development meeting the California Green Building Code Tier 1 standards. These data were calculated using the Energy Star Target Finder tool.

Project-specific energy demand for the structures and pools was estimated using the Energy Star Target Finder tool (Glumac 2019). Additionally, the project would install a total of 701-kilowatt in photovoltaic systems that would produce an estimated 45% of project-wide demand including project-wide water heating and pool heating.

The estimation of operational energy emissions was based on project specific energy demand . Emissions are calculated by multiplying the energy use by the utility carbon intensity (pounds of GHGs per kilowatt-hour for electricity or 1,000 British thermal units for natural gas) for CO_2 and other GHGs. Annual natural gas (non-hearth) and electricity emissions were estimated in CalEEMod using the emissions factors for San Diego Gas & Electric (SDG&E), which would be the energy source provider for the project.

CalEEMod default energy intensity factors (CO_2, CH_4, and N_2O mass emissions per kilowatt hour) for SDG&E is based on the value for SDG&E's energy mix in 2009. The CO_2 emissions intensity factor for utility energy use in CalEEMod were adjusted to account for SDG&E's 2017 renewable procurement rate of 44% (SDG&E 2017).

Mobile Sources

All details for criteria air pollutants discussed in Section 2.4.2.2 are also applicable for the estimation of operational mobile source GHG emissions. Regulatory measures related to mobile sources include AB 1493 (Pavley) and related federal standards. AB 1493 required that CARB establish GHG emission standards for automobiles, light-duty trucks, and other vehicles determined by CARB to be vehicles that are primarily used for noncommercial personal transportation in the state. In addition, the NHTSA and EPA have established corporate fuel economy standards and GHG emission standards, respectively, for automobiles and light-, medium-, and heavy-duty vehicles. Implementation of these standards and fleet turnover (replacement of older vehicles with newer ones) will gradually reduce emissions from the project's motor vehicles. The effectiveness of fuel economy improvements was evaluated using the CalEEMod emission factors for motor vehicles in 2023 to the extent it was captured in EMFAC2014.

The Low Carbon Fuel Standard calls for a 10% reduction in the "carbon intensity" of motor vehicle fuels by 2020, which would further reduce GHG emissions. However, the carbon intensity reduction associated with the Low Carbon Fuel Standard was not assumed in EMFAC2014 and thus, was not included in CalEEMod Version 2016.3.2 or the calculations below.

Solid Waste

The project would generate solid waste, and therefore, result in CO_2e emissions associated with landfill off-gassing. CalEEMod default values for solid waste generation were used to estimate GHG emissions associated with solid waste. Under AB 341, the State of California required jurisdictions to achieve a 75% diversion rate by 2020. The City's CAP aims to exceed a waste diversion rate of 80% by 2020 and 90% by 2035. The CAP does not include any specific measures the project would be required to implement. While AB 341 aims for a statewide 75% diversion rate by 2020, project compliance with the 50% diversion rate, consistent with the solid waste diversion requirements of AB 939, Integrated Waste Management Act, has been included in the GHG assessment.

Water and Wastewater

Supply, conveyance, treatment, and distribution of water for the project require the use of electricity, which would result in associated indirect GHG emissions. Similarly, wastewater generated by the project requires the use of electricity for conveyance and treatment, and GHG emissions will be generated during wastewater treatment. Water consumption estimates for both indoor and outdoor water use and associated electricity consumption from water use and wastewater generation were estimated using project-specific estimates using the Energy Star Portfolio Manager (Glumac 2019).

In regards to indoor water use, the project would install low-flow bathroom and kitchen faucets, low-flow toilets, and low-flow showers. In regards to outdoor water, the project would install water-efficient devices and landscaping in accordance with applicable ordinances, including use of drought-tolerant species appropriate to the climate and region. The project has committed to not include turf, which would reduce water use associated with landscaping.

3.4.2.3 Land Use Change and Vegetation Carbon Sequestration

Loss of Sequestered Carbon

The calculation methodology and default values provided in CalEEMod (CAPCOA 2017) were used to calculate potential CO_2 emissions associated with the one-time change in carbon sequestration capacity of a vegetation land use type. The calculation of the one-time loss of sequestered carbon is the product of the converted acreage value and the carbon content value for each land use type (vegetation community). The mass of sequestered carbon per unit area

(expressed in units of MT of CO_2/acre) is dependent on the specific land use type. Assuming that the sequestered carbon is released as CO_2 after removal of the vegetation, annual CO_2 is calculated by multiplying total biomass (MT of dry matter per acre) from IPCC data by the carbon fraction in plant material, and then converting MT of carbon to MT of CO_2 based on the molecular weights of carbon and CO_2.

It is conservatively assumed that all sequestered carbon from the removed vegetation will be returned to the atmosphere; that is, the wood from the trees and vegetation communities would not be re-used in a solid form or another form that would retain carbon. GHG emissions generated during construction activities, including clearing, tree removal, and grading, are estimated in the construction emissions analysis.

The loss of sequestered carbon was estimated for the removal of vegetation and the removal of trees. For the removal of vegetation, CalEEMod calculates GHG emissions resulting from land conversion and uses six[15] general IPCC land use classifications for assigning default carbon content values (in units of MT CO_2/acre). CalEEMod default carbon content values were assumed to estimate the loss of sequestered carbon (release of CO_2) from the removal of the scrub (14.3 MT CO_2/acre), forest (111 MT CO_2/acre), and grassland (4.31 MT CO_2/acre) vegetation categories, which are based on data and formulas provided in the IPCC reports. The project would permanently disturb a total of 15.55 acres with varying carbon content values.

To estimate the loss of sequestered carbon from removing trees, the default CalEEMod values for estimating the gain of sequestered carbon from planting trees were applied. The project would remove a total of 53 trees from the site. The trees that would be removed are of varying species and ages; therefore, the “miscellaneous” tree type from CalEEMod was selected.[16] A growing period of 20 years was assumed consistent with the IPCC active growing period assumption (CAPCOA 2017). While growing periods vary, the IPCC active growing period of 20 years is appropriate because as biomass ages, trees grow more slowly and carbon sequestration slows due to clipping, pruning and death (CAPCOA 2017).

Gain of Sequestered Carbon

The calculation methodology and default values provided in CalEEMod were also used to estimate the one-time carbon-stock change from planting new trees. Trees sequester CO_2 while they are actively growing and the amount of CO_2 sequestered depends on the type of tree. Thereafter, the accumulation of carbon in biomass slows with age, and is assumed to be offset by losses from

[15] Forest land (scrub), forest land (trees), cropland, grassland, wetlands, and other.

[16] The CalEEMod default CO_2 sequestered value for "miscellaneous" trees is greater than the default CO_2 sequestered value for "pine" trees; therefore, the "miscellaneous" value is considered a conservative assumption and an appropriate representation of the mix of 53 trees removed.

clipping, pruning, and occasional death. Active growing periods are subject to, among other things, species, climate regime, and planting density; however, for modeling purposes, CalEEMod assumes the IPCC active growing period of 20 years (CAPCOA 2017).

The sequestered carbon from new trees modeling does not include CO_2 emissions estimates associated with planting, care, and maintenance activities (e.g., tree planting, care vehicle travel, and maintenance equipment operation). Landscape maintenance equipment emissions, which are anticipated to be minimal, were included in the area source emission estimates included in the operational GHG emissions calculations. Conservatively, this analysis does not consider carbon sequestration associated with land preservation or conservation.

CalEEMod calculates GHG sequestration that results from planting of new trees and has default carbon content values (in units of MT CO_2 per tree per year) for 10 different general tree species and a miscellaneous tree category.[17] As the types of tree species that will be planted within the project area are currently unknown, the CO_2 sequestration rate of 0.0354 MT CO_2 per tree per year for the miscellaneous tree species category was assumed in this analysis. It is assumed that all 77 trees will grow for a minimum of 20 years consistent with CalEEMod (CAPCOA 2017).

3.5 Impact Analysis

3.5.1 Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction Emissions

Construction of the project would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road vendor trucks, and worker vehicles. The SCAQMD *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold* (2009) recommends that "construction emissions be amortized over a 30-year project lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies." Thus, the total construction GHG emissions were calculated, amortized over 30 years, and added to the total operational emissions for comparison with the GHG significance threshold of 4.48 MT CO_2e per service population per year. The determination of significance, therefore, is addressed in the operational emissions discussion following the estimated construction emissions.

CalEEMod was used to calculate the annual GHG emissions based on the construction scenario described in Section 2.4.2.1. Construction of the project is anticipated to commence in October

[17] Aspen, soft maple, mixed hardwood, hardwood maple, juniper, cedar/larch, Douglas fir, true fir/hemlock, pine, spruce, and miscellaneous.

2020 and reach completion in November 2022, lasting a total of 26 months. On-site sources of GHG emissions include off-road equipment and off-site sources including haul trucks, vendor trucks, and worker vehicles. Table 14 presents construction emissions for the project in 2020, 2021, and 2022 from on-site and off-site emission sources.

Table 14
Estimated Annual Construction GHG Emissions

Year	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
2020	410.74	0.09	0.00	412.87
2021	738.32	0.10	0.00	740.89
2022	556.07	0.08	0.00	558.05
			Total	**1,711.81**

Notes: CO_2 = carbon dioxide; CH_4 = methane; GHG = greenhouse gas; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.
See Appendix A for complete results.

As shown in Table 14, the estimated total GHG emissions during construction of would be approximately 1,712 MT CO_2e over the construction period.

As discussed in Section 3.4.2, Carbon Sequestration, the loss of sequestered carbon is estimated based on the carbon content for each vegetation land use type (MT CO_2 per acre) and the initial and final acreage of the vegetation land use type. The project would permanently impact 0.27acres of scrubland, and 4.15 acres of grasslands. The project would also permanently impact 9.18 acres of disturbed habitat and 1.79 acres of developed land which do not have carbon value per CalEEMod (CAPCOA 2017), but are presented for completeness. The loss of sequestered carbon associated with the project's land use change is presented in Table 15.

Table 15
Vegetation Removal – Estimated Loss of Sequestered Carbon

Project Vegetation Land Use	Vegetation Land Use Category	Vegetation Land Use Category Subtype	Permanent Impact Acreage (acres)	Biogenic CO_2 Emissions (MT CO_2/Acre)	Sequestered CO_2 (MT CO_2)
Southern Coastal Bluff Scrub	Forest Land	Scrub	0.27	14.3	3.86
Ornamental	Grassland	Grassland	4.15	4.3	17.85
Disturbed Habitat	Others	Others	9.18	0.0	0.00
Urban/Developed	Others	Others	1.79	0.0	0.00
				Total	**21.71**

Source: CAPCOA 2017.
Notes: CO_2 = carbon dioxide; MT CO_2 = metric tons of carbon dioxide.
See Appendix A for complete results.

The loss of sequestered carbon from the removal of individual trees was estimated using the same process as estimating carbon gain from new trees as described in Section 3.4.2. The 53 trees that would be removed from the project site were assumed to have completed the active growing cycle, which is assumed to be 20 years (CAPCOA 2017).[18] The loss of sequestered carbon from tree removal is presented in Table 16.

Table 16
Removed Trees – Estimated Loss of Sequestered Carbon

Project Tree Category/Species	Tree Category	Growing Period (year)	Number of Trees (trees)	Tree CO_2 Sequestered Factor (MT CO_2/Tree/Year)	Gain of Sequestered CO_2 (MT CO_2)
Various	Miscellaneous	20	53	0.0354	37.52
				Total	**37.52**

Source: CAPCOA 2017.
Notes: CO_2 = carbon dioxide; MT CO_2 = metric tons carbon dioxide.
See Appendix A for calculations and references.

As shown in Table 14, the total construction emissions for the project were 1,712 MT CO_2e. The combined emissions for the construction period plus the total loss of carbon due to vegetation and tree removal (59 MT CO_2e; Tables 15 and 16) is estimated to be 1,771 MT CO_2e. The "project life" is assumed to be 30 years, which is consistent with the 30-year project life time frame used by SCAQMD's GHG guidance (SCAQMD 2008). Accordingly, the loss of sequestered carbon and construction emissions amortized over 30 years is approximately 59 MT CO_2e per year.

Operational Emissions

Operation of the project would generate GHG emissions through motor vehicle trips to and from the project site; landscape maintenance equipment operation; energy use (natural gas and generation of electricity consumed by the project); solid waste disposal; and generation of electricity associated with water supply, treatment, and distribution and wastewater treatment. CalEEMod was used to calculate the annual GHG emissions based on the operational assumptions described in Section 3.4.2.2, Operation.

[18] The program assumes the IPCC active growing period of 20 years. Thereafter, the accumulation of carbon in biomass slows with age, and will be completely offset by losses from clipping, pruning, and occasional death. Actual active growing periods are subject to, among other things, species, climate regime, and planting density. Note that trees may also be replaced at the end of the 20-year cycle, which would result in additional years of carbon sequestration. However, this would be offset by the potential net release of carbon from the removal of the replaced tree.

The estimated operational (year 2023) project-generated GHG emissions from area sources, energy usage, motor vehicles, solid waste generation, and water usage and wastewater generation are shown in Table 17.

Table 17
Estimated Annual Operational GHG Emissions

Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	139.93	<0.01[a]	<0.01[a]	140.78
Energy	1,407.42	0.05	0.02	1,415.62
Reduction from Photovoltaics	(206.80)	(0.01)	(<0.01)[a]	(207.65)
Mobile	1,586.59	0.08	0.00	1,588.58
Solid Waste	9.43	0.56	0.00	23.37
Water Supply and Wastewater	46.79	0.02	0.01	50.71
Total	2,983.36	0.70	0.03	3,011.41
			Amortized Construction Emissions	*59.03*
			Operation + Amortized Construction Total	**3,070.44**

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent
See Appendix A for detailed results.
These emissions reflect CalEEMod "mitigated" output and operational year 2023.
[a] <0.01 = value less than reported 0.01 metric tons per year.

As shown in Table 17, estimated annual project-generated GHG emissions would be approximately 3,011 MT CO_2e per year as a result of project operations only. Estimated annual project-generated operational emissions in 2023 plus amortized project construction emissions would be approximately 3,070 MT CO_2e per year.

As discussed in Section 3.3.2, this GHG analysis also estimates the gain of sequestered carbon that would result from the planting and growth of trees on site. The gain of sequestered carbon resulting from planting and growth of approximately 77 miscellaneous trees on site is estimated based on the carbon sequestration rate for the tree species, the number of new trees, and the growing period. Table 18 presents the estimated one-time carbon-stock change resulting from proposed planting of new trees.

Table 18
Planted Trees – Estimated Gain of Sequestered Carbon

Project Tree Category/Species	Tree Category	Growing Period (year)	Number of Trees (trees)	Tree CO_2 Sequestered Factor (MT CO_2/Tree/Year)	Gain of Sequestered CO_2 (MT CO_2)
Various	Miscellaneous	20	77	0.0354	54.52
				Total	**54.52**

Source: CAPCOA 2016.
Notes: CO_2 = carbon dioxide; MT CO_2 = metric tons carbon dioxide.
See Appendix A for calculations and references.

As presented in Table 18, the gain in sequestered carbon resulting from planting 77 trees would be approximately 55 MT CO_2. To interpret an annual sequestration, the total sequestered CO_2 was divided by the project lifetime of 30 years, resulting in 2 MT CO_2 annually.

The project would entail 353 employees, 146 full-time residents of the villas, 8 residents of the single-family housing units, 45 residents of the affordable housing, and 135 hotel guests.[19] Therefore, the service population of the project would be 687 people.

Estimated annual GHG emissions of 3,068 MT CO_2e per year divided by a service population of 687 people is 4.47 MT CO_2e per service population per year. As such, annual operational GHG emissions with amortized construction emissions would not exceed the statewide service population threshold of 4.48 MT CO_2e per service population per year. Therefore, the project's GHG contribution would not be cumulatively considerable and is **less than significant**.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

3.5.2 Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Consistency with the City's Climate Action Plan

As previously discussed, the City's CAP is not a qualified CAP under CEQA Section 15183.5, and does not include project-specific requirements. The City's CAP is a long-range plan to reduce GHG emissions from communitywide activities within the City and would also prepare the City from the impending effects of climate change. The City is committed to reducing its GHG emissions by 15% below 2012 levels by 2020 and 50% below 2012 levels by 2035, consistent with AB 32 and the State of California's GHG emission reduction goals. In order to reduce citywide GHG emissions, the CAP identifies a series of reduction measures or strategies, which will guide the City in several key focus areas (e.g., energy and buildings, water and waste, transportation, and urban tree planting). Table 20 presents the project's consistency with the CAP.

[19] The household size of the villas was assumed to be 2.02 persons consistent with the average household size in the City of Del Mar. Each workforce housing unit was assumed to have one resident. Each hotel room is anticipated to have an average of 1.8 guests per room, which was determined by 2017 occupancy rates at a similar resort and does not reflect a fully occupied hotel.

Table 20
Project Consistency with the City of Del Mar CAP

Project Compliance	CAP Measure
Goal 1: Residential Photovoltaics	**Consistent**: The project would install a photovoltaic system on the villas that would produce 678,000 kilowatt-hours (kWh) annually. This represents 94% of the villas energy demand.
Goal 2: Non-Residential Photovoltaics	**Consistent**: The project would install a photovoltaic system on the hotel that would produce 339,000 kWh annually. This represents 28% of the hotels energy demand.
Goal 3: Residential Efficiency Retrofits—Single-Family Homes	**Not Applicable**: The project would not include the retrofit of existing buildings.
Goal 4: Residential Efficiency Retrofits—Multifamily Homes	**Not Applicable**: The project would not include the retrofit of existing buildings.
Goal 5: Non-Residential Efficiency Retrofits	**Not Applicable**: The project would not include the retrofit of existing buildings.
Goal 6: Residential Solar Hot Water Heater Installation	**Consistent**: The project would install a solar hot water systems to serve the domestic hot water and pool heating. The systems would produce a combined 16,000 therms.
Goal 7: Renewable Energy Supply	**Consistent**: The project would be served by SDG&E, which as of 2017 had a 44% renewable energy content value (SDG&E 2017). Additionally, 45% of the project's electricity demand would be offset by photovoltaic systems. This would meet the City's goal of procuring 50% of renewable energy supply by 2020.
Goal 8: Reduce Residential Indoor Water Consumption in Remodeled Single-Family Homes	**Not Applicable**: The project would not include the redevelopment of single-family homes.
Goal 9: Reduce Outdoor Water Consumption	**Consistent:** The project will be consistent with Del Mar's Model Water Efficient Landscape Ordinance (MWELO). According to MWELO, there is an allotment of 5.9 million gallons per year (MGY); it is estimated that the project would have a usage of 3.5 MGY of recycled water. The irrigation controller will receive localized real-time evapotranspiration data that can adjust daily application of water through run-time adjustments. The controller will be specified with flow sensing equipment that monitors flow rates to terminate irrigation as a result of high or low flow situations. Flow alarms will be communicated to the facility maintenance manager via email or cell phone alert. A rain sensor will also be installed to terminate irrigation during wet weather.
Goal 10: Pool Cover Program	**Consistent**: The project's pools would be covered after hours in order to save energy and water.
Goal 11: Divert Waste from Landfills and Capture Emissions	**Consistent**: The project would comply with all applicable local and state regulations. Additionally, the project would adopt a "Waste Management Policy" which would implement a waste stream monitoring program and identifying proper disposal strategies.

Table 20
Project Consistency with the City of Del Mar CAP

Project Compliance	CAP Measure
Goal 12: Capture Emissions from Wastewater Treatment	**Not Applicable**: The project would not include a wastewater treatment plant.
Goal 13: Increase Mass Transit Ridership	**Consistent**: The project's transportation demand management measures include: providing a free shuttle from the Solana Beach coaster station, providing employees with Compass Card on which transit fares can be stored, and offer employees free monthly transit passes.
Goal 14: Adopt a Bicycle Strategy	**Consistent**: The project would provide short-term and long-term bicycle parking spaces consisting of convenient and secure, permanently anchored bicycle racks. The project would also host a bike-share program.
Goal 15: Pedestrian Mobility Plan	**Consistent**: The project would improve the crossings at Via de la Valle and Camino Del Mar.
Goal 16: Increase the Percentage of VMT Being Driven by Electric and Alternative Fuel Vehicles	**Consistent**: The project would provide 1% of the parking spaces to be equipped with electric vehicle charging equipment. The project would designate 6% of total parking as 'EV Capable'. Additionally, each residential unit would be outfitted with an electrical vehicle-charging unit.
Goal 17: Increase Number of Preferential Parking Spaces for Clean Vehicles	**Consistent**: The project would be consistent with California Green Building Code Section 5.106.5.2 "Designated Parking For Clean Air Vehicles". The project would designate 8% of total parking as designated for low emitting, or fuel-efficient and carpool/van pool vehicles.
Goal 18: Install Roundabouts	**Not Applicable**: The project does not include road reconfiguration.
Goal 19: Increase Percentage of Population with Alternate Work Schedules	**Consistent**: The project would include a variety of employees with alternate work schedules, including housekeeping, customer service, and restaurant employees.
Goal 20: Increase Telecommuting	**Not Applicable**: The project does not include employees with job duties suitable for telecommuting.
Goal 21: Increase Van Pooling	**Consistent**: The project's transportation demand management measures include providing preferential parking for vanpools and maintaining commute transportation information on display. Additionally, the project would provide a visitor shuttle into downtown Del Mar.
Goal 22: Implement Urban Tree Planting Program	**Consistent**: The project would plant 77 trees on the project site.

Source: LLG 2017.
Notes: VMT = vehicle miles traveled; EV = electric vehicle.

Additionally, the project's GHG emissions of 4.47 MT CO_2e per service population per year, which is less than the CAP efficiency threshold, demonstrates compliance with the CAP. Measures outlined

within the CAP would not be directly applicable to the project and are intended for the City to implement. Therefore, the project would not conflict with the City's CAP.

Consistency with SANDAG'S San Diego Forward: The Regional Plan

Regarding consistency with SANDAG's Regional Plan, the project would be developed to support the policy objectives of the RTP and SB 375. For example, the project would include a shuttle to the coaster station, provide employees with free transit passes, and include a bike share program. Additionally, on-site generation of energy for electricity and hot water which will offset a portion of energy consumption and power all community facilities would support environmental stewardship in everyday operation of the project.

Table 21 illustrates the project's consistency with applicable goals and policies of *San Diego Forward: The Regional Plan* (SANDAG 2015).

Table 21
San Diego Forward: The Regional Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
The Regional Plan – Policy Objectives		
Mobility Choices	Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people live, work, and play.	*Consistent.* The project would provide all employees with a Compass Card, which would provide them free access to the Coaster and local Breeze buses. Additionally, the project would provide a shuttle from the Solana Beach Coaster Station and provide a bike share program.
Mobility Choices	Take advantage of new technologies to make the transportation system more efficient and environmentally friendly.	*Not applicable.* The project would not impair the ability of SANDAG to implement new technologies within the transportation system within the region.
Habitat and Open Space Preservation	Focus growth in areas that are already urbanized, allowing the region to set aside and restore more open space in our less developed areas.	*Consistent.* The project would be built in an urbanized area near downtown Solana Beach and Del Mar. The project would preserve access to the coastline and north bluff preserve.
Habitat and Open Space Preservation	Protect and restore our region's urban canyons, coastlines, beaches, and water resources.	*Consistent.* The project would enhance public access to open space and the coastline. The project would utilize low impact development to prevent run off into the ocean from storm water and irrigation.
Regional Economic Prosperity	Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages.	*Not Applicable.* The project would not impair the ability of SANDAG to invest in transportation projects available to all members of the Community.

Table 21
San Diego Forward: The Regional Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
Regional Economic Prosperity	Build infrastructure that makes the movement of freight in our community more efficient and environmentally friendly.	*Not Applicable.* The project does not propose regional freight movement, nor would it impair SANDAG's ability to preserve and expand options for regional freight movement.
Partnerships/Collaboration	Collaborate with Native American tribes, Mexico, military bases, neighboring counties, infrastructure providers, the private sector, and local communities to design a transportation system that connects to the mega-region and national network, and works for everyone and fosters a high quality of life for all.	*Not Applicable.* The project would not impair the ability of SANDAG to provide transportation choices to better connect the San Diego region with Mexico, neighboring counties, and tribal nations.
Partnerships/Collaboration	As we plan for our region, recognize the vital economic, environmental, cultural, and community linkages between the San Diego region and Baja California.	*Not Applicable.* The project would not impair the ability of SANDAG to provide transportation choices to better connect the San Diego region with Mexico.
Healthy and Complete Communities	Create great places for everyone to live, work, and play.	*Consistent.* The project would provide coastal access, a public pedestrian trail around the project site to the North Bluff Preserve, a low-cost visitors inn, and work force housing.
Healthy and Complete Communities	Connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.	*Consistent.* The project would improve pedestrian crossing at Via de la Valle and Camino del Mar. The project would also include a bike share program.
Environmental Stewardship	Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living.	*Consistent.* The project would improve pedestrian crossing at Via de la Valle and Camino del Mar. The project would also include a bike share program. Additionally, the project would provide all employees with a Compass Card, which would provide them free access to the Coaster and local Breeze buses. The project would provide a shuttle from the Solana Beach Coaster Station
Environmental Stewardship	Support energy programs that promote sustainability.	*Consistent.* The project would include on-site renewable energy production through a solar photovoltaic rooftop and solar hot water system.
Sustainable Communities Strategy (SCS) – Strategies		
Strategy #1	Focus housing and job growth in urbanized areas where there is existing and planned transportation infrastructure, including transit.	*Consistent.* The project would be located near developed urban and employment centers.

Table 21
San Diego Forward: The Regional Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
Strategy #2	Protect the environment and help ensure the success of smart growth land use policies by preserving sensitive habitat, open space, cultural resources, and farmland.	*Consistent.* The project would protect the North Bluff Preserve. Development would be restricted to an improved coastal access trail, new public viewpoints, a picnic area, and existing pathway and vegetation improvements.
Strategy #3	Invest in a transportation network that gives people transportation choices and reduces GHG emissions.	*Not Applicable.* The project would not impair SANDAG's ability to invest in transportation network choices that reduce GHG emissions.
Strategy #4	Address the housing needs of all economic segments of the population.	*Not Applicable.* The project would develop 22 affordable workforce residential units.
Strategy #5	Implement the Regional Plan through incentives and collaboration.	*Not Applicable.* The project would not impair the ability of SANDAG to implement the RTP through incentives and collaborations.

Source: SANDAG 2015.

As shown in Table 21, the project is consistent with applicable policy objectives and strategies from the SANDAG Regional Plan.

Consistency with EO S-3-05 and SB 32

The project would not impede the attainment of the GHG reduction goals for 2030 or 2050 identified in EO S-3-05 and SB 32. As discussed in Section 3.2.2, EO S-3-05 establishes the following goals: GHG emissions should be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050. SB 32 establishes for a statewide GHG emissions reduction target whereby CARB, in adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions, shall ensure that statewide GHG emissions are reduced to at least 40% below 1990 levels by December 31, 2030. While there are no established protocols or thresholds of significance for that future year analysis; CARB forecasts that compliance with the current Scoping Plan puts the state on a trajectory of meeting these long-term GHG goals, although the specific path to compliance is unknown (CARB 2014).

To begin, CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in the First Update to the Climate Change Scoping Plan that "California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32" (CARB 2014). With regard to the 2050 target for reducing GHG emissions to 80% below 1990 levels, the First Update to the Climate Change Scoping Plan states the following (CARB 2014):

> This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts of renewable

> distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80% below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions.

In other words, CARB believes that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, SB 32, and EO S-3-05. This is confirmed in the *Second Update*, which states (CARB 2017b):

> The Proposed Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while also identifying new, technologically feasibility and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health, including in disadvantaged communities. The Proposed Plan is developed to be consistent with requirements set forth in AB 32, SB 32, and AB 197.

As discussed previously, the project would not exceed the 2023 interpolated service population threshold, which is consistent with the City's 2030 reduction targets and SB 32. Therefore, the project would not interfere with implementation of any of the above-described GHG reduction goals for 2030 or 2050. Because the project would not exceed the threshold, this analysis provides support for the conclusion that the project would not impede the state's trajectory toward the above-described statewide GHG reduction goals for 2030 or 2050. In addition, Table 22 below presents the project's consistency with statewide GHG reduction laws and regulations.

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
Building Components/Facility Operations		
Roofs/Ceilings/Insulation	CALGreen Code (Title 24, Part 11) California Energy Code (Title 24, Part 6)	The project must comply with efficiency standards regarding roofing, ceilings, and insulation. For example: Roofs/Ceilings: New construction must reduce roof heat island effects per CALGreen Code Section 106.11.2, which requires use of roofing materials having a minimum aged solar reflectance, thermal emittance complying with Section A5.106.11.2.2 and A5.106.11.2.3 or a minimum aged Solar Reflectance Index as specified in Tables A5.106.11.2.2, or A5.106.11.2.3. Roofing materials must also meet solar reflectance and thermal emittance standards contained in Title 20 Standards.

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
		Roof/Ceiling Insulation: There are also requirements for the installation of roofing and ceiling insulation. (See Title 24, Part 6 Compliance Manual at Section 3.2.2.)
Flooring	CALGreen Code	The project must comply with efficiency standards regarding flooring materials. For example, for 80% of floor area receiving "resilient flooring," the flooring must meet applicable installation and material requirements contained in CALGreen Code Section 5.504.4.6.
Window and Doors (Fenestration)	California Energy Code	The project must comply with fenestration efficiency requirements. For example, the choice of windows, glazed doors, and any skylights for the project must conform to energy consumption requirements affecting size, orientation, and types of fenestration products used. (See Title 24, Part 6 Compliance Manual, Section 3.3.)
Building Walls/Insulation	CALGreen Code California Energy Code	The project must comply with efficiency requirements for building walls and insulation. Exterior Walls: Must meet requirements in current edition of California Energy Code, and comply with Sections A5.106.7.1 or A5.106.7.2 of CALGreen Code for wall surfaces, as well as Section 5.407.1, which required weather-resistant exterior wall and foundation envelope as required by California Building Code Section 1403.2. Construction must also meet requirements contained in Title 24, Part 6, which vary by material of the exterior walls. (See Title 24, Part 6 Compliance Manual, Part 3.2.3.) Demising (Interior) Walls: Mandatory insulation requirements for demising walls (which separate conditioned from non-conditions space) differ by the type of wall material used. (*Id*. at 3.2.4.) Door Insulation: There are mandatory requirements for air infiltration rates to improve insulation efficiency; they differ according to the type of door. (*Id*. at 3.2.5.) Flooring Insulation: There are mandatory requirements for insulation that depend on the material and location of the flooring. (*Id*. at 3.2.6.)
Finish Materials	CALGreen Code	The project must comply with pollutant control requirements for finish materials. For example, materials including adhesives, sealants, caulks, paints and coatings, carpet systems, and composite wood products must meet requirements in CALGreen Code to ensure pollutant control. (CALGreen Code Section 5.504.4.)
Wet Appliances (Toilets/Faucets/Urinals, Dishwasher/Clothes Washer, Spa and Pool/Water Heater)	CALGreen Code California Energy Code Appliance Efficiency Regulations (Title 20 Standards)	Wet appliances associated with the project must meet various efficiency requirements. For example: Spa and Pool: Use associated with the project is subject to appliance efficiency requirements for service water heating systems and equipment, spa and pool heating systems and equipment. (Title 24, Part 6, Sections 110.3, 110.4, 110.5; Title 20 Standards, Sections 1605.1(g), 1605.3(g); see also California Energy Code.)

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
		Toilets/Faucets/Urinals: Use associated with the project is subject to maximum rates for toilets, urinals, and faucets: • Showerheads maximum flow rate 2.5 gpm at 80 psi • Wash fountains 2.2 x (rim space in inches/20) gpm at 60 psi • Metering faucets 0.25 gallons/cycle • Lavatory faucets and aerators 1.2 gpm at 60 psi • Kitchen faucets and aerators 1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi • Public lavatory faucets 0.5 gpm at 60 psi • Trough-type urinals 16 inches length • Wall mounted urinals 0.125 gallons per flush • Other urinals 0.5 gallons per flush (Title 20 Standards, Sections 1605.1(h),(i) 1065.3(h),(i).) Water Heaters: Use associated with the project is subject to appliance efficiency requirements for water heaters. (Title 20 Standards, Sections 1605.1(f), 1605.3(f).) Dishwasher/Clothes Washer: Use associated with the project is subject to appliance efficiency requirements for dishwashers and clothes washers. (Title 20 Standards, Sections 1605.1(o),(p),(q), 1605.3(o),(p),(q).)
Dry Appliances (Refrigerator/Freezer, Heater/Air Conditioner, Clothes Dryer)	Title 20 Standards CALGreen Code	Dry appliances associated with the project must meet various efficiency requirements. For example: Refrigerator/Freezer: Use associated with the project is subject to appliance efficiency requirements for refrigerators and freezers. (Title 20 Standards, Sections 1605.1(a), 1605.3(a).) Heater/Air Conditioner: Use associated with the project is subject to appliance efficiency requirements for heaters and air conditioners. (Title 20 Standards, Sections 1605.1(b),(c),(d),(e), 1605.3(b),(c),(d),(e) as applicable.) Clothes Dryer: Use associated with the project is subject to appliance efficiency requirements for clothes dryers. (Title 20 Standards, Section 1605.1(q).)
	CALGreen Code	Installations of HVAC, refrigeration and fire suppression equipment must comply with CALGreen Code Sections 5.508.1.1 and 508.1.2, which prohibits CFCs, halons, and certain HCFCs and HFCs.
Lighting	Title 20 Standards	Lighting associated with the project will be subject to energy efficiency requirements contained in Title 20 Standards. General Lighting: Indoor and outdoor lighting associated with the project must comply with applicable appliance efficiency regulations (Title 20 Standards, Sections 1605.1(j),(k),(n), 1605.3(j),(k),(n).) Emergency lighting and self-contained lighting: the project must also comply with applicable appliance efficiency regulations (Title 20 Standards, Sections 1605.1(l), 1605.3(l).)

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
		Traffic Signal Lighting: For any necessary project improvements involving traffic lighting, traffic signal modules and traffic signal lamps will need to comply with applicable appliance efficiency regulations (Title 20 Standards, Sections 1605.1(m), 1605.3(m).)
	California Energy Code	Lighting associated with the project will also be subject to energy efficiency requirements contained in Title 24, Part 6, which contains energy standards for non-residential indoor lighting and outdoor lighting. (See Title 24 Part 6 Compliance Manual, at Sections 5, 6.) Mandatory lighting controls for indoor lighting include, for example, regulations for automatic shut-off, automatic daytime controls, demand responsive controls, and certificates of installation. (Id. at Section 5.) Regulations for outdoor lighting include, for example, creation of lighting zones, lighting power requirements, a hardscape lighting power allowance, requirements for outdoor incandescent and luminaire lighting, and lighting control functionality. (Id. at Section 6.)
	AB 1109	Lighting associated with the project will be subject to energy efficiency requirements adopted pursuant to AB 1109. Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general purpose lighting, to reduce electricity consumption 50% for indoor residential lighting and 25% for indoor commercial lighting.
Bicycle and Vehicle Parking	CALGreen Code	The project will be required to provide compliant bicycle parking, fuel-efficient vehicle parking, and electric vehicle charging spaces (CALGreen Code Sections 5.106.4, 5.106.5.1, 5.106.5.3)
	California Energy Code	The project is also subject to parking requirements contained in Title 24, Party 6. For example, parking capacity is to meet but not exceed minimum local zoning requirements, and the project should employ approved strategies to reduce parking capacity (Title 24, Part 6, section 106.6)
Landscaping	CALGreen Code	The CALGreen Code requires and has further voluntary provisions for: - A water budget for landscape irrigation use; - For new water service, separate meters or submeters must be installed for indoor and outdoor potable water use for landscaped areas of 1,000-5,000 square feet; - Provide water-efficient landscape design that reduces use of potable water beyond initial requirements for plant installation and establishment
	EO B-29-15	The project is also subject to emissions reduction requirements to be achieved by implementation of EO B-29-15. This emergency executive order directs the Department of Water Resources to lead a statewide initiative to replace 50 million square feet of lawns and ornamental turf with drought tolerant landscapes.

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
		The order also directed the departments to update the Model Water Efficient Landscaping Ordinance, which they did in 2015.
	Model Water Efficient Landscaping Ordinance	The model ordinance promotes efficient landscaping in new developments and establishes an outdoor water budget for new and renovated landscaped areas that are 500 square feet or larger. (CCR, Title 23, Division 2, Chapter 2.7.)
	Cap-and-Trade Program	Transportation fuels used in landscape maintenance equipment (e.g., gasoline) would be subject to the Cap-and-Trade Program. (See "Energy Use," below.)
Refrigerants	CARB Management of High GWP Refrigerants for Stationary Sources	Any refrigerants associated with the project will be subject to CARB standards. CARB's Regulation for the Management of High GWP Refrigerants for Stationary Sources 1) reduces emissions of high-GWP refrigerants from leaky stationary, non-residential refrigeration equipment; 2) reduces emissions resulting from the installation and servicing of stationary refrigeration and air conditioning appliances using high-GWP refrigerants; and 3) requires verification GHG emission reductions. (CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 5.1, Section 95380 et seq.)
Consumer Products	CARB High GWP GHGs in Consumer Products	All consumer products associated with the project will be subject to CARB standards. CARB's consumer products regulations set VOC limits for numerous categories of consumer products, and limits the reactivity of the ingredients used in numerous categories of aerosol coating products (CCR, Title 17, Division 3, Chapter 1, Subchapter 8.5.)
Construction		
Use of Off-Road Diesel Engines, Vehicles, and Equipment	CARB In-Use Off-Road Diesel Vehicle Regulation	Any relevant vehicle or machine use associated with the project will be subject to CARB standards. The CARB In-Use-Off-Road Diesel Vehicle Regulation applies to certain off-road diesel engines, vehicles, or equipment greater than 25 horsepower. The regulation: 1) imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles; 2) requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled; 3) restricts the adding of older vehicles into fleets starting on January 1, 2014; and 4) requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits). The requirements and compliance dates of the Off-Road regulation vary by fleet size, as defined by the regulation.
	Cap-and-Trade Program	Transportation fuels (e.g., gasoline) used in equipment operation would be subject to the Cap-and-Trade Program. (See "Energy Use," below.)
Pollutant Control	CALGreen Code	If an HVAC system is used during construction, the project must use return air filters with a MERV of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30% based on ASHRAE 5.2.1-

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
		1992. All filters must be replaced immediately prior to occupancy. (CALGreen Code Section A5.504.1.3.)
Greening New Construction	CALGreen Code	All new construction, including the project, must comply with CALGreen Code, as discussed in more detail throughout this table. Adoption of the mandatory CALGreen Code standards for construction has been essential for improving the overall environmental performance of new buildings; it also sets voluntary targets for builders to exceed the mandatory requirements.
Construction Waste	CALGreen Code	The project will be subject to CALGreen Code requirements for construction waste reduction, disposal, and recycling, such as a requirement to recycle and/or salvage for reuse a minimum of 50% of the non-hazardous construction waste in accordance with Section 5.408.1.1, 5.408.1.2, or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.
Worker, vendor and truck vehicle trips (on-road vehicles)	Cap-and-Trade Program	Transportation fuels (e.g., gasoline) used in worker, vendor and truck vehicle trips would be subject to the Cap-and-Trade Program. (See "Energy Use," below.)
Solid Waste		
Solid Waste Management	Landfill Methane Control Measure	Waste associated with the project will be disposed per state requirements for landfills, material recovery facilities, and transfer stations. Per the statewide GHG emissions inventory, the largest emissions from waste management sectors come from landfills, and are in the form of CH_4. In 2010, CARB adopted a regulation that reduces emissions from methane in landfills, primarily by requiring owners and operators of certain uncontrolled municipal solid waste landfills to install gas collection and control systems, and requires existing and newly installed gas and control systems to operate in an optimal manner. The regulation allows local air districts to voluntarily enter into a memorandum of understanding with CARB to implement and enforce the regulation and to assess fees to cover costs of implementation.
	Mandatory Commercial Recycling (AB 341)	AB 341 will require the project, if it generates four cubic yards or more of commercial solid waste per week, to arrange for recycling services, using one of the following: self-haul; subscribe to a hauler(s); arranging for pickup of recyclable materials; subscribing to a recycling service that may include mixed waste processing that yields diversion results comparable to source separation. The project will also be subject to local commercial solid waste recycling program required to be implemented by each jurisdiction under AB 341.
	CALGreen Code	The project will be subject to CALGreen Code requirement to provide areas that serve the entire building and are identified for

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
		the depositing, storage and collection of nonhazardous materials for recycling (CALGreen Code Section 5.410.1)
Energy Use		
Electricity/Natural Gas Generation	Cap-and-Trade Program	Electricity and natural gas usage associated with the project will be subject to the Cap-and-Trade Program. The rules came into effect on January 1, 2013, applying to large electric power plants and large industrial plants. In 2015, importers and distributors of fossil fuels were added to the Cap-and-Trade Program in the second phase. Specifically, on January 1, 2015, cap-and-trade compliance obligations were phased in for suppliers of natural gas, reformulated gasoline blendstock for oxygenate blending (RBOB), distillate fuel oils, and liquefied petroleum gas that meet or exceed specified emissions thresholds. The threshold that triggers a cap-and-trade compliance obligation for a fuel supplier is 25,000 metric tons or more of CO_2e annually from the GHG emissions that would result from full combustion or oxidation of quantities of fuels (including natural gas, RBOB, distillate fuel oil, liquefied petroleum gas, and blended fuels that contain these fuels) imported and/or delivered to California.
Renewable Energy	California RPS (SB X1-2, SB 350, and SB 100)	Energy providers associated with the project will be required to comply with RPS set by SB X1 2, SB 350, and SB 100. SB X1 2 requires investor-owned utilities, publicly-owned utilities, and electric service providers to increase purchases of renewable energy such that at least 33% of retail sales are procured from renewable energy resources by December 31, 2020. In the interim, each entity was required to procure an average of 20% of renewable energy for the period of January 1, 2011 through December 31, 2013; and will be required to procure an average of 25% by December 31, 2016, and 33% by 2020. SB 350 requires retail sellers and publicly owned utilities to procure 50% of their electricity from eligible renewable energy resources by 2030. SB 100 increased the standards set forth in SB 350 establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030, be secured from qualifying renewable energy sources. SB 100 states that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100% of the retail sales of electricity to California by 2045.
	Million Solar Roofs Program (SB 1)	The project will participate in California's energy market, which is affected by implementation of the Million Solar Roofs Program. As part of Governor Schwarzenegger's Million Solar Roofs Program, California has set a goal to install 3,000 megawatts of new, solar capacity through 2016. The Million Solar Roofs Program is a ratepayer-financed incentive program aimed at

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
		transforming the market for rooftop solar systems by driving down costs over time.
	California Solar Initiative-Thermal Program	The project will participate in California's energy market, which is affected by implementation of the California Solar Initiative - Thermal Program. The program offers cash rebates of up to $4,366 on solar water heating systems for single-family residential customers. Multifamily and Commercial properties qualify for rebates of up to $800,000 on solar water heating systems and eligible solar pool heating systems qualify for rebates of up to $500,000. Funding for the California Solar Initiative-Thermal program comes from ratepayers of Pacific Gas & Electric, SCE, Southern California Gas Company, and San Diego Gas & Electric. The rebate program is overseen by the CPUC as part of the California Solar Initiative.
	Waste Heat and Carbon Emissions Reduction Act (AB 1613, AB 2791)	The project will participate in California's energy market, which is affected by implementation of the Waste Heat and Carbon Emissions Reduction Act. Originally enacted in 2007 and amended in 2008, this act directed the CEC, CPUC, and CARB to implement a program that would encourage the development of new combined heat and power systems in California with a generating capacity of not more than 20 megawatts, to increase combined heat and power use by 30,000 gigawatt-hour. The CPUC publicly owned electric utilities, and CEC duly established policies and procedures for the purchase of electricity from eligible combined heat and power systems. CEC guidelines require combined heat and power systems to be designed to reduce waste energy; have a minimum efficiency of 60%; have NO_x emissions of no more than 0.07 pounds per megawatt-hour; be sized to meet eligible customer generation thermal load; operate continuously in a manner that meets expected thermal load and optimizes efficient use of waste heat; and be cost effective, technologically feasible, and environmentally beneficial.
Vehicular/Mobile Sources		
General	SB 375 and SANDAG Regional Plan	The project complies with, and is subject to, the SANDAG Regional Plan, which CARB approved as meeting its regional GHG targets in 2016.
Fuel	Low Carbon Fuel Standard (LCFS)/ EO S-01-07	Auto trips associated with the project will be subject to LCFS (EO S-01-07), which requires a 10% or greater reduction in the average fuel carbon intensity by 2020 with a 2010 baseline for transportation fuels in California regulated by CARB. The program establishes a strong framework to promote the low carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG goals.

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
	Cap-and-Trade Program	Use of gasoline associated with the project will be subject to the Cap-and-Trade Program. The rules came into effect on January 1, 2013, applying to large electric power plants and large industrial plants. In 2015, importers and distributors of fossil fuels were added to the Cap-and-Trade Program in the second phase. Specifically, on January 1, 2015, cap-and-trade compliance obligations were phased in for suppliers of natural gas, RBOB, distillate fuel oils, and liquefied petroleum gas that meet or exceed specified emissions thresholds. The threshold that triggers a cap-and-trade compliance obligation for a fuel supplier is 25,000 MT or more of CO_2e annually from the GHG emissions that would result from full combustion or oxidation of quantities of fuels (including natural gas, RBOB, distillate fuel oil, liquefied petroleum gas, and blended fuels that contain these fuels) imported and/or delivered to California.
Automotive Refrigerants	CARB Regulation for Small Containers of Automotive Refrigerant	Vehicles associated with the project will be subject to CARB's Regulation for Small Containers of Automotive Refrigerant. (CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 5, Section 95360 et seq.) The regulation applies to the sale, use, and disposal of small containers of automotive refrigerant with a GWP greater than 150. The regulation achieves emission reductions through implementation of four requirements: 1) use of a self-sealing valve on the container, 2) improved labeling instructions, 3) a deposit and recycling program for small containers, and 4) an education program that emphasizes best practices for vehicle recharging. This regulation went into effect on January 1, 2010 with a one-year sell-through period for containers manufactured before January 1, 2010. The target recycle rate is initially set at 90%, and rises to 95% beginning January 1, 2012.
Light-Duty Vehicles	AB 1493 (or the Pavley Standard)	Cars that drive to and from the project will be subject to AB 1493, which directed CARB to adopt a regulation requiring the maximum feasible and cost effective reduction of GHG emissions from new passenger vehicles. Pursuant to AB 1493, CARB adopted regulations that establish a declining fleet average standard for CO_2, CH_4, N_2O, and HFCs (air conditioner refrigerants) in new passenger vehicles and light-duty trucks beginning with the 2009 model year and phased-in through the 2016 model year. These standards are divided into those applicable to lighter and those applicable to heavier portions of the passenger vehicle fleet. The regulations will reduce "upstream" smog-forming emissions from refining, marketing, and distribution of fuel.
	Advanced Clean Car and ZEV Programs	Cars that drive to and from the project will be subject to the Advanced Clean Car and ZEV Programs. In January 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot and global warming gases and

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
		requirements for greater numbers of zero-emission vehicles into a single package of standards called Advanced Clean Cars. By 2025, new automobiles will emit 34% fewer global warming gases and 75% fewer smog-forming emissions. The ZEV program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles in the 2018-2025 model years.
	Tire Inflation Regulation	Cars that drive to and from the project will be subject to the CARB Tire Inflation Regulation, which took effect on September 1, 2010, and applies to vehicles with a gross vehicle weight rating of 10,000 pounds or less. Under this regulation, automotive service providers must, inter alia, check and inflate each vehicle's tires to the recommended tire pressure rating, with air or nitrogen, as appropriate, at the time of performing any automotive maintenance or repair service, and to keep a copy of the service invoice for a minimum of three years, and make the vehicle service invoice available to the CARB, or its authorized representative upon request.
	EPA and NHTSA GHG and CAFE standards.	Mobile sources that travel to and from the project would be subject to EPA and NHTSA GHG and CAFE standards for passenger cars, light-duty trucks, and medium-duty passenger vehicles. (75 FR 25324–25728 and 77 FR 62624–63200.)
Medium- and Heavy-Duty Vehicles	CARB In-Use On-Road Heavy-Duty Diesel Vehicles Regulation (Truck and Bus Regulation)	Any heavy-duty trucks associated with the project will be subject to CARB standards. The regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet PM filter requirements. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. The regulation applies to nearly all privately and federally owned diesel fueled trucks and buses and to privately and publicly owned school buses with a gross vehicle weight rating greater than 14,000 pounds.
	CARB In-Use Off-Road Diesel Vehicle Regulation	Any relevant vehicle or machine use associated with the project will be subject to CARB standards. The CARB In-Use-Off-Road Diesel Vehicle Regulation applies to certain off-road diesel engines, vehicles, or equipment greater than 25 horsepower. The regulations: 1) imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles; 2) requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled; 3) restricts the adding of older vehicles into fleets starting on January 1, 2014; and 4) requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits).

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
		The requirements and compliance dates of the Off-Road regulation vary by fleet size, as defined by the regulation.
	Heavy-Duty Vehicle GHG Emission Reduction Regulation	Any relevant vehicle or machine use associated with the project will be subject to CARB standards. The CARB Heavy-Duty Vehicle GHG Emission Reduction Regulation applies to heavy-duty tractors that pull 53-foot or longer box-type trailers. (CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 1, Section 95300 et seq.) Fuel efficiency is improved through improvements in tractor and trailer aerodynamics and the use of low rolling resistance tires.
	EPA and NHTSA GHG and CAFE standards.	Mobile sources that travel to and from the project would be subject to EPA and NHTSA GHG and CAFE standards for medium- and heavy-duty vehicles. (76 FR 57106–57513.)
Water Use		
Water Use Efficiency	Emergency State Water Board Regulations	Water use associated with the project will be subject to emergency regulations. On May 18, 2016, partially in response to EO B-27-16, the State Water Board adopted emergency water use regulations (CCR, title 23, Section 864.5 and amended and re-adopted Sections 863, 864, 865, and 866). The regulation directs the State Water Board, Department of Water Resources, and CPUC to implement rates and pricing structures to incentivize water conservation, and calls upon water suppliers, homeowners' associations, California businesses, landlords and tenants, and wholesale water agencies to take stronger conservation measures.
	EO B-37-16	Water use associated with the project will be subject to Emergency EO B-37-16, issued May 9, 2016, which directs the State Water Resources Control Board to adjust emergency water conservation regulations through the end of January, 2017 to reflect differing water supply conditions across the state. The Water Board must also develop a proposal to achieve a mandatory reduction of potable urban water usage that builds off the mandatory 25% reduction called for in EO B-29-15. The Water Board and Department of Water Resources will develop new, permanent water use targets to which the project will be subject. The Water Board will permanently prohibit water-wasting practices such as hosing off sidewalks, driveways, and other hardscapes; washing automobiles with hoses not equipped with a shut-off nozzle; using non-recirculated water in a fountain or other decorative water feature; watering lawns in a manner that causes runoff, or within 48 hours after measurable precipitation; and irrigating ornamental turf on public street medians.
	EO B-40-17	EO B-40-17 lifted the drought emergency in all California counties except Fresno, Kings, Tulare, and Tuolumne. It also rescinds EO B-29-15, but expressly states that EO B-37-16 remains in effect and directs the State Water Resources Control Board to continue

Table 22
Greenhouse Gas Related Laws and Regulations

Project Component	Applicable Laws/ Regulations	GHG Reduction Measures Required for Project
		development of permanent prohibitions on wasteful water use to which the project will be subject.
	SB X7-7	Water provided to the project will be affected by SB X7-7's requirements for water suppliers. SB X7-7, or the Water Conservation Act of 2009, requires all water suppliers to increase water use efficiency. It also requires, among other things, that the Department of Water Resources, in consultation with other state agencies, develop a single standardized water use reporting form, which would be used by both urban and agricultural water agencies.
	CALGreen Code	The project is subject to CALGreen Code's water efficiency standards, including a required 20% mandatory reduction in indoor water use. (CALGreen Code, Division 4.3.)
	California Water Code, Division 6, Part 2.10, Sections 10910–10915.	Development and approval of the project requires the development of a project-specific Water Supply Assessment.
	Cap-and-Trade Program	Electricity usage associated with water and wastewater supply, treatment and distribution would be subject to the Cap-and-Trade Program.
	California RPS (SB X1-2, SB 350, SB 100)	Electricity usage associated with water and wastewater supply, treatment and distribution associated with the project will be required to comply with RPS set by SB X1-2, SB 350, and SB 100.
Water Recycling	Water Reclamation Requirements for Recycled Water Use. State Water Resources Control Board Order WQ 2016-0068-DDW	These requirements replace 2014-0090-DWQ General Waste Discharge Requirements for Recycled Water Use, and establish standard conditions for recycled water use and conditionally delegates authority to an Administrator to manage a Water Recycling Program and issue Water Recycling Permits to recycled water users. Only treated municipal wastewater for non-potable uses can be permitted, such as landscape irrigation, crop irrigation, dust control, industrial/commercial cooling, decorative fountains, etc. Potable reuse is not covered.
	Regulations for Groundwater Replenishment Using Recycled Water	This emergency rulemaking by the California Department of Public Health (California Title of Regulations, Title 22, Sections 60301.050 et seq.), effective June 18, 2014, applied to Groundwater Replenishment Reuse projects utilizing surface application, which received initial permits from the Regional Board. The regulations address permitting and plan approval, sampling requirements, operation requirements, and ongoing reporting requirements.
	Policy for Water Quality Control for Recycled Water. State Water Resources Control Board Resolution No. 2009-0011, as amended by Resolution No. 2013-0003	The project would be subject to the State Water Resources Control Board statewide mandate to increase recycled water usage by 0.2 million acre-feet per year by 2020. It is estimated that the project would have a usage of 3.5 MGY of recycled water.

Based on the preceding considerations, the project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, and thus impacts would be **less than significant**.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

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13 CCR 2025. Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants, from In-Use Heavy-Duty Diesel-Fueled Vehicles.

13 CCR 2449–2449.3 and Appendix A. General Requirements for In-Use Off-Road Diesel-Fueled Fleets.

13 CCR 2485. Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling

14 CCR 15000–15387 and Appendices A–L. Guidelines for Implementation of the California Environmental Quality Act, as amended.

17 CCR 95480 et seq. Subarticle 7. Low Carbon Fuel Standard (Refs & Annos)

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APPENDIX A

CalEEMod Output Files

CalEEMod Version: CalEEMod.2016.3.2

Date: 10/16/2019 9:22 AM

Marsol Project
San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	93.34	1000sqft	0.00	93,340.00	0
Hotel	65.00	Room	0.00	131,611.00	0
Motel	10.00	Room	0.00	6,834.00	0
Apartments Low Rise	22.00	Dwelling Unit	0.00	16,174.00	63
Condo/Townhouse	81.00	Dwelling Unit	14.86	171,599.00	232
Single Family Housing	4.00	Dwelling Unit	0.00	28,000.00	11

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2023
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	448.3	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 100% of remaining electricty purchased from CCA or equivalent program

Land Use - Applicant specific information. Total site acreage included in residential uses. User Defined Res = Affordable Housing and Motel = Market Rate Hotel.

Construction Phase - Architectural coating to occur concurrently with building and paving. Demolition concurrent with site preperation.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - For pipeline work.

Off-road Equipment - For pipeline work.

Off-road Equipment - For pipeline work.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Added 2 trenchers for pipeline work.

Trips and VMT - Rounded worker and vendor trips to reflect round trips.

Demolition - Demolition of 5,800 SF building.

Grading - 43,000 CY of soil exported.

Architectural Coating - Del Mar Sustainability Plan

Vehicle Trips - LLG 2019

Woodstoves - No woodstoves or wood burning fireplaces. 166 natural gas fireplaces for hotel and residential uses and 10 fire pits.

Area Coating - Del Mar Sustainability Plan

Energy Use - Glumac 2019

Water And Wastewater - Glumac 2019

Construction Off-road Equipment Mitigation -

Energy Mitigation - 1,017,000 kWh of renewables energy from installation of PVs.

Waste Mitigation - AB 341

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaCoating	Area_EF_Nonresidential_Interior	250	50
tblAreaCoating	Area_EF_Residential_Exterior	250	100
tblAreaCoating	Area_EF_Residential_Interior	250	50

tblConstructionPhase	NumDays	20.00	413.00
tblConstructionPhase	NumDays	300.00	440.00
tblConstructionPhase	NumDays	20.00	30.00
tblConstructionPhase	NumDays	30.00	45.00
tblConstructionPhase	NumDays	30.00	25.00
tblConstructionPhase	NumDays	20.00	25.00
tblConstructionPhase	NumDays	20.00	35.00
tblConstructionPhase	NumDays	10.00	30.00
tblConstructionPhase	NumDays	10.00	20.00
tblEnergyUse	LightingElect	810.36	0.00
tblEnergyUse	LightingElect	1,001.10	0.00
tblEnergyUse	LightingElect	1.75	0.00
tblEnergyUse	LightingElect	4.50	3.25
tblEnergyUse	LightingElect	4.50	0.00
tblEnergyUse	LightingElect	1,608.84	0.00
tblEnergyUse	NT24E	3,172.76	3,002.07
tblEnergyUse	NT24E	3,795.01	8,363.45
tblEnergyUse	NT24E	0.19	0.00
tblEnergyUse	NT24E	3.67	2.65
tblEnergyUse	NT24E	3.67	4.39
tblEnergyUse	NT24E	6,155.97	41,986.15
tblEnergyUse	NT24NG	4,180.00	1,981.53
tblEnergyUse	NT24NG	4,180.00	25,474.44
tblEnergyUse	NT24NG	11.10	9.48
tblEnergyUse	NT24NG	11.10	2.23
tblEnergyUse	NT24NG	4,180.00	279,725.51
tblEnergyUse	T24E	260.86	179.74
tblEnergyUse	T24E	227.22	500.75
tblEnergyUse	T24E	3.92	0.00
tblEnergyUse	T24E	4.78	3.45
tblEnergyUse	T24E	4.78	5.71

tblEnergyUse	T24E	331.07	2,513.85
tblEnergyUse	T24NG	7,045.49	4,836.66
tblEnergyUse	T24NG	10,202.85	62,179.88
tblEnergyUse	T24NG	47.27	40.37
tblEnergyUse	T24NG	47.27	9.48
tblEnergyUse	T24NG	19,206.92	682,774.49
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	12.10	0.00
tblFireplaces	NumberGas	44.55	176.00
tblFireplaces	NumberGas	2.20	0.00
tblFireplaces	NumberNoFireplace	2.20	0.00
tblFireplaces	NumberNoFireplace	8.10	0.00
tblFireplaces	NumberNoFireplace	0.40	0.00
tblFireplaces	NumberWood	7.70	0.00
tblFireplaces	NumberWood	28.35	0.00
tblFireplaces	NumberWood	1.40	0.00
tblGrading	MaterialExported	0.00	43,000.00
tblLandUse	LandUseSquareFeet	94,380.00	131,611.00
tblLandUse	LandUseSquareFeet	19,602.00	6,834.00
tblLandUse	LandUseSquareFeet	22,000.00	16,174.00
tblLandUse	LandUseSquareFeet	81,000.00	171,599.00
tblLandUse	LandUseSquareFeet	7,200.00	28,000.00
tblLandUse	LotAcreage	2.14	0.00
tblLandUse	LotAcreage	2.17	0.00
tblLandUse	LotAcreage	0.45	0.00
tblLandUse	LotAcreage	1.38	0.00
tblLandUse	LotAcreage	5.06	14.86

tblLandUse	LotAcreage	1.30	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblProjectCharacteristics	CO2IntensityFactor	720.49	448.3
tblTripsAndVMT	HaulingTripNumber	4,252.00	5,376.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
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tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	49.00	50.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	15.00	16.00
tblTripsAndVMT	WorkerTripNumber	3.00	6.00
tblTripsAndVMT	WorkerTripNumber	8.00	4.00
tblTripsAndVMT	WorkerTripNumber	8.00	4.00
tblTripsAndVMT	WorkerTripNumber	173.00	174.00
tblTripsAndVMT	WorkerTripNumber	35.00	36.00
tblTripsAndVMT	WorkerTripNumber	15.00	16.00
tblVehicleTrips	CC_TL	7.30	7.79
tblVehicleTrips	CC_TL	7.30	7.79
tblVehicleTrips	CC_TL	7.30	7.79
tblVehicleTrips	CNW_TL	7.30	7.79
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tblVehicleTrips	CNW_TL	7.30	7.79
tblVehicleTrips	CW_TL	9.50	7.79
tblVehicleTrips	CW_TL	9.50	7.79
tblVehicleTrips	CW_TL	9.50	7.79
tblVehicleTrips	DV_TP	11.00	0.00

tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	DV_TP	38.00	0.00
tblVehicleTrips	DV_TP	38.00	0.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	7.50	7.79
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tblVehicleTrips	HO_TL	7.50	7.79
tblVehicleTrips	HO_TTP	39.60	40.00
tblVehicleTrips	HO_TTP	39.60	40.00
tblVehicleTrips	HO_TTP	39.60	40.00
tblVehicleTrips	HS_TL	7.30	7.79
tblVehicleTrips	HS_TL	7.30	7.79
tblVehicleTrips	HS_TL	7.30	7.79
tblVehicleTrips	HS_TTP	18.80	19.00
tblVehicleTrips	HS_TTP	18.80	19.00
tblVehicleTrips	HS_TTP	18.80	19.00
tblVehicleTrips	HW_TL	10.80	7.79
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tblVehicleTrips	PB_TP	3.00	0.00
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tblVehicleTrips	PB_TP	4.00	0.00
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tblVehicleTrips	PR_TP	58.00	100.00

tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	7.16	8.14
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tblVehicleTrips	SU_TR	4.84	8.14
tblVehicleTrips	SU_TR	5.95	10.50
tblVehicleTrips	SU_TR	5.63	8.14
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tblVehicleTrips	WD_TR	6.59	6.00
tblVehicleTrips	WD_TR	5.81	8.00
tblVehicleTrips	WD_TR	8.17	8.00
tblVehicleTrips	WD_TR	5.63	6.00
tblVehicleTrips	WD_TR	9.52	12.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
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tblWater	IndoorWaterUseRate	5,277,476.08	0.00
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tblWater	IndoorWaterUseRate	253,667.70	0.00
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tblWater	OutdoorWaterUseRate	903,658.01	0.00
tblWater	OutdoorWaterUseRate	3,327,104.48	0.00
tblWater	OutdoorWaterUseRate	183,204.45	1,850,288.27
tblWater	OutdoorWaterUseRate	28,185.30	0.00
tblWater	OutdoorWaterUseRate	164,301.46	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
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tblWoodstoves	NumberCatalytic	1.10	0.00
tblWoodstoves	NumberCatalytic	4.05	0.00
tblWoodstoves	NumberCatalytic	0.20	0.00
tblWoodstoves	NumberNoncatalytic	1.10	0.00
tblWoodstoves	NumberNoncatalytic	4.05	0.00
tblWoodstoves	NumberNoncatalytic	0.20	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

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					
2020	0.2360	2.9092	1.6096	4.4500e-003	0.4952	0.1108	0.6060	0.2298	0.1026	0.3324	0.0000	410.7433	410.7433	0.0852	0.0000	412.8735
2021	0.9793	3.4711	3.2713	8.1700e-003	0.3720	0.1431	0.5151	0.0977	0.1349	0.2326	0.0000	738.3161	738.3161	0.1029	0.0000	740.8897
2022	0.9784	2.3734	2.6112	6.1900e-003	0.2004	0.0973	0.2976	0.0540	0.0918	0.1459	0.0000	556.0705	556.0705	0.0790	0.0000	558.0452
Maximum	**0.9793**	**3.4711**	**3.2713**	**8.1700e-003**	**0.4952**	**0.1431**	**0.6060**	**0.2298**	**0.1349**	**0.3324**	**0.0000**	**738.3161**	**738.3161**	**0.1029**	**0.0000**	**740.8897**

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					
2020	0.2360	2.9092	1.6096	4.4500e-003	0.2521	0.1108	0.3630	0.1113	0.1026	0.2139	0.0000	410.7430	410.7430	0.0852	0.0000	412.8732
2021	0.9793	3.4711	3.2713	8.1700e-003	0.3243	0.1431	0.4674	0.0859	0.1349	0.2209	0.0000	738.3157	738.3157	0.1029	0.0000	740.8893
2022	0.9784	2.3734	2.6112	6.1900e-003	0.2004	0.0973	0.2976	0.0540	0.0918	0.1459	0.0000	556.0701	556.0701	0.0790	0.0000	558.0449
Maximum	**0.9793**	**3.4711**	**3.2713**	**8.1700e-003**	**0.3243**	**0.1431**	**0.4674**	**0.1113**	**0.1349**	**0.2209**	**0.0000**	**738.3157**	**738.3157**	**0.1029**	**0.0000**	**740.8893**

	ROG	NOx	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**	**27.24**	**0.00**	**20.50**	**34.13**	**0.00**	**18.32**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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	1.5553	0.1289	0.8472	8.1000e-004		0.0141	0.0141		0.0141	0.0141	0.0000	139.9272	139.9272	3.9100e-003	2.5400e-003	140.7823
Energy	0.0957	0.8370	0.4911	5.2200e-003		0.0661	0.0661		0.0661	0.0661	0.0000	1,407.4152	1,407.4152	0.0480	0.0235	1,415.6235
Mobile	0.3884	1.5571	4.7312	0.0172	1.5785	0.0133	1.5917	0.4227	0.0124	0.4350	0.0000	1,586.5913	1,586.5913	0.0796	0.0000	1,588.5812
Waste						0.0000	0.0000		0.0000	0.0000	18.8680	0.0000	18.8680	1.1151	0.0000	46.7447
Water						0.0000	0.0000		0.0000	0.0000	5.0223	41.7654	46.7876	0.0200	0.0115	50.7086
Total	**2.0393**	**2.5229**	**6.0695**	**0.0232**	**1.5785**	**0.0935**	**1.6719**	**0.4227**	**0.0925**	**0.5152**	**23.8903**	**3,175.6990**	**3,199.5893**	**1.2665**	**0.0375**	**3,242.4403**

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	1.5553	0.1289	0.8472	8.1000e-004		0.0141	0.0141		0.0141	0.0141	0.0000	139.9272	139.9272	3.9100e-003	2.5400e-003	140.7823
Energy	0.0957	0.8370	0.4911	5.2200e-003		0.0661	0.0661		0.0661	0.0661	0.0000	1,200.6128	1,200.6128	0.0346	0.0208	1,207.6620
Mobile	0.3884	1.5571	4.7312	0.0172	1.5785	0.0133	1.5917	0.4227	0.0124	0.4350	0.0000	1,586.5913	1,586.5913	0.0796	0.0000	1,588.5812
Waste						0.0000	0.0000		0.0000	0.0000	9.4340	0.0000	9.4340	0.5575	0.0000	23.3724
Water						0.0000	0.0000		0.0000	0.0000	5.0223	41.7654	46.7876	0.0200	0.0115	50.7086
Total	**2.0393**	**2.5229**	**6.0695**	**0.0232**	**1.5785**	**0.0935**	**1.6719**	**0.4227**	**0.0925**	**0.5152**	**14.4563**	**2,968.8967**	**2,983.3529**	**0.6956**	**0.0348**	**3,011.1064**

	ROG	NOx	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	39.49	6.51	6.76	45.08	7.38	7.13

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2020	11/11/2020	5	30	
2	Site Preparation	Site Preparation	10/1/2020	11/11/2020	5	30	
3	Pipeline Site Preparation	Site Preparation	11/12/2020	12/9/2020	5	20	For Pipeline
4	Grading	Grading	11/12/2020	1/13/2021	5	45	
5	Pipeline Installation/Backfill	Grading	11/23/2020	12/25/2020	5	25	For Pipeline
6	Pipeline Paving	Paving	12/7/2020	1/8/2021	5	25	For Pipeline
7	Building Construction	Building Construction	1/14/2021	9/21/2022	5	440	
8	Architectural Coating	Architectural Coating	4/13/2021	11/10/2022	5	413	
9	Paving	Paving	9/22/2022	11/9/2022	5	35	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 0

Residential Indoor: 436,940; Residential Outdoor: 145,647; Non-Residential Indoor: 207,668; Non-Residential Outdoor: 69,223; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Pipeline Site Preparation	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Pipeline Installation/Backfill	Excavators	1	8.00	158	0.38
Pipeline Installation/Backfill	Generator Sets	1	8.00	84	0.74
Pipeline Installation/Backfill	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Pipeline Paving	Graders	1	8.00	187	0.41
Pipeline Paving	Paving Equipment	1	8.00	132	0.36
Pipeline Paving	Rollers	1	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	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
Demolition	6	16.00	0.00	26.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pipeline Site Preparation	1	6.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	4.00	5,376.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pipeline Installation/Backfill	3	4.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pipeline Paving	3	4.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	174.00	50.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	36.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	16.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2020

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					2.8900e-003	0.0000	2.8900e-003	4.4000e-004	0.0000	4.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0497	0.4980	0.3263	5.8000e-004		0.0249	0.0249		0.0231	0.0231	0.0000	50.9979	50.9979	0.0144	0.0000	51.3578
Total	**0.0497**	**0.4980**	**0.3263**	**5.8000e-004**	**2.8900e-003**	**0.0249**	**0.0278**	**4.4000e-004**	**0.0231**	**0.0236**	**0.0000**	**50.9979**	**50.9979**	**0.0144**	**0.0000**	**51.3578**

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	1.0000e-004	3.7000e-003	8.5000e-004	1.0000e-005	2.2000e-004	1.0000e-005	2.3000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	1.0026	1.0026	9.0000e-005	0.0000	1.0049
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	8.8000e-004	6.5000e-004	6.4200e-003	2.0000e-005	1.9200e-003	1.0000e-005	1.9400e-003	5.1000e-004	1.0000e-005	5.2000e-004	0.0000	1.7397	1.7397	5.0000e-005	0.0000	1.7410
Total	**9.8000e-004**	**4.3500e-003**	**7.2700e-003**	**3.0000e-005**	**2.1400e-003**	**2.0000e-005**	**2.1700e-003**	**5.7000e-004**	**2.0000e-005**	**5.9000e-004**	**0.0000**	**2.7423**	**2.7423**	**1.4000e-004**	**0.0000**	**2.7459**

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					1.3000e-003	0.0000	1.3000e-003	2.0000e-004	0.0000	2.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0497	0.4980	0.3263	5.8000e-004		0.0249	0.0249		0.0231	0.0231	0.0000	50.9979	50.9979	0.0144	0.0000	51.3578
Total	**0.0497**	**0.4980**	**0.3263**	**5.8000e-004**	**1.3000e-003**	**0.0249**	**0.0262**	**2.0000e-004**	**0.0231**	**0.0233**	**0.0000**	**50.9979**	**50.9979**	**0.0144**	**0.0000**	**51.3578**

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	1.0000e-004	3.7000e-003	8.5000e-004	1.0000e-005	2.2000e-004	1.0000e-005	2.3000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	1.0026	1.0026	9.0000e-005	0.0000	1.0049
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	8.8000e-004	6.5000e-004	6.4200e-003	2.0000e-005	1.9200e-003	1.0000e-005	1.9400e-003	5.1000e-004	1.0000e-005	5.2000e-004	0.0000	1.7397	1.7397	5.0000e-005	0.0000	1.7410
Total	**9.8000e-004**	**4.3500e-003**	**7.2700e-003**	**3.0000e-005**	**2.1400e-003**	**2.0000e-005**	**2.1700e-003**	**5.7000e-004**	**2.0000e-005**	**5.9000e-004**	**0.0000**	**2.7423**	**2.7423**	**1.4000e-004**	**0.0000**	**2.7459**

3.3 Site Preparation - 2020

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					0.2710	0.0000	0.2710	0.1490	0.0000	0.1490	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0612	0.6363	0.3227	5.7000e-004		0.0330	0.0330		0.0303	0.0303	0.0000	50.1460	50.1460	0.0162	0.0000	50.5515
Total	**0.0612**	**0.6363**	**0.3227**	**5.7000e-004**	**0.2710**	**0.0330**	**0.3040**	**0.1490**	**0.0303**	**0.1793**	**0.0000**	**50.1460**	**50.1460**	**0.0162**	**0.0000**	**50.5515**

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	2.3000e-004	6.8400e-003	1.8200e-003	2.0000e-005	4.0000e-004	3.0000e-005	4.3000e-004	1.1000e-004	3.0000e-005	1.5000e-004	0.0000	1.5832	1.5832	1.2000e-004	0.0000	1.5862
Worker	1.0000e-003	7.4000e-004	7.2200e-003	2.0000e-005	2.1700e-003	2.0000e-005	2.1800e-003	5.8000e-004	1.0000e-005	5.9000e-004	0.0000	1.9572	1.9572	6.0000e-005	0.0000	1.9586
Total	**1.2300e-003**	**7.5800e-003**	**9.0400e-003**	**4.0000e-005**	**2.5700e-003**	**5.0000e-005**	**2.6100e-003**	**6.9000e-004**	**4.0000e-005**	**7.4000e-004**	**0.0000**	**3.5403**	**3.5403**	**1.8000e-004**	**0.0000**	**3.5448**

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					0.1220	0.0000	0.1220	0.0670	0.0000	0.0670	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0612	0.6363	0.3227	5.7000e-004		0.0330	0.0330		0.0303	0.0303	0.0000	50.1460	50.1460	0.0162	0.0000	50.5514
Total	**0.0612**	**0.6363**	**0.3227**	**5.7000e-004**	**0.1220**	**0.0330**	**0.1549**	**0.0670**	**0.0303**	**0.0974**	**0.0000**	**50.1460**	**50.1460**	**0.0162**	**0.0000**	**50.5514**

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	2.3000e-004	6.8400e-003	1.8200e-003	2.0000e-005	4.0000e-004	3.0000e-005	4.3000e-004	1.1000e-004	3.0000e-005	1.5000e-004	0.0000	1.5832	1.5832	1.2000e-004	0.0000	1.5862
Worker	1.0000e-003	7.4000e-004	7.2200e-003	2.0000e-005	2.1700e-003	2.0000e-005	2.1800e-003	5.8000e-004	1.0000e-005	5.9000e-004	0.0000	1.9572	1.9572	6.0000e-005	0.0000	1.9586
Total	**1.2300e-003**	**7.5800e-003**	**9.0400e-003**	**4.0000e-005**	**2.5700e-003**	**5.0000e-005**	**2.6100e-003**	**6.9000e-004**	**4.0000e-005**	**7.4000e-004**	**0.0000**	**3.5403**	**3.5403**	**1.8000e-004**	**0.0000**	**3.5448**

3.4 Pipeline Site Preparation - 2020

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	4.1800e-003	0.0330	0.0369	6.0000e-005		1.9800e-003	1.9800e-003		1.9800e-003	1.9800e-003	0.0000	5.3766	5.3766	3.4000e-004	0.0000	5.3851
Total	**4.1800e-003**	**0.0330**	**0.0369**	**6.0000e-005**	**0.0000**	**1.9800e-003**	**1.9800e-003**	**0.0000**	**1.9800e-003**	**1.9800e-003**	**0.0000**	**5.3766**	**5.3766**	**3.4000e-004**	**0.0000**	**5.3851**

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	2.2000e-004	1.6000e-004	1.6100e-003	0.0000	4.8000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4349	0.4349	1.0000e-005	0.0000	0.4353
Total	**2.2000e-004**	**1.6000e-004**	**1.6100e-003**	**0.0000**	**4.8000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4349**	**0.4349**	**1.0000e-005**	**0.0000**	**0.4353**

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	4.1800e-003	0.0330	0.0369	6.0000e-005		1.9800e-003	1.9800e-003		1.9800e-003	1.9800e-003	0.0000	5.3766	5.3766	3.4000e-004	0.0000	5.3851
Total	**4.1800e-003**	**0.0330**	**0.0369**	**6.0000e-005**	**0.0000**	**1.9800e-003**	**1.9800e-003**	**0.0000**	**1.9800e-003**	**1.9800e-003**	**0.0000**	**5.3766**	**5.3766**	**3.4000e-004**	**0.0000**	**5.3851**

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	2.2000e-004	1.6000e-004	1.6100e-003	0.0000	4.8000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4349	0.4349	1.0000e-005	0.0000	0.4353
Total	**2.2000e-004**	**1.6000e-004**	**1.6100e-003**	**0.0000**	**4.8000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4349**	**0.4349**	**1.0000e-005**	**0.0000**	**0.4353**

3.5 Grading - 2020

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					0.1681	0.0000	0.1681	0.0660	0.0000	0.0660	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0801	0.9036	0.5753	1.1200e-003		0.0391	0.0391		0.0360	0.0360	0.0000	98.0717	98.0717	0.0317	0.0000	98.8647
Total	**0.0801**	**0.9036**	**0.5753**	**1.1200e-003**	**0.1681**	**0.0391**	**0.2072**	**0.0660**	**0.0360**	**0.1020**	**0.0000**	**98.0717**	**98.0717**	**0.0317**	**0.0000**	**98.8647**

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	0.0172	0.6117	0.1401	1.6700e-003	0.0437	1.9300e-003	0.0456	0.0118	1.8500e-003	0.0137	0.0000	165.8494	165.8494	0.0149	0.0000	166.2227
Vendor	2.7000e-004	8.2100e-003	2.1800e-003	2.0000e-005	4.8000e-004	4.0000e-005	5.2000e-004	1.4000e-004	4.0000e-005	1.8000e-004	0.0000	1.8998	1.8998	1.5000e-004	0.0000	1.9034
Worker	1.3300e-003	9.8000e-004	9.6300e-003	3.0000e-005	2.8900e-003	2.0000e-005	2.9100e-003	7.7000e-004	2.0000e-005	7.9000e-004	0.0000	2.6096	2.6096	8.0000e-005	0.0000	2.6115
Total	**0.0188**	**0.6209**	**0.1519**	**1.7200e-003**	**0.0471**	**1.9900e-003**	**0.0491**	**0.0127**	**1.9100e-003**	**0.0146**	**0.0000**	**170.3587**	**170.3587**	**0.0152**	**0.0000**	**170.7377**

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					0.0756	0.0000	0.0756	0.0297	0.0000	0.0297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0801	0.9036	0.5753	1.1200e-003		0.0391	0.0391		0.0360	0.0360	0.0000	98.0716	98.0716	0.0317	0.0000	98.8646
Total	**0.0801**	**0.9036**	**0.5753**	**1.1200e-003**	**0.0756**	**0.0391**	**0.1148**	**0.0297**	**0.0360**	**0.0657**	**0.0000**	**98.0716**	**98.0716**	**0.0317**	**0.0000**	**98.8646**

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	0.0172	0.6117	0.1401	1.6700e-003	0.0437	1.9300e-003	0.0456	0.0118	1.8500e-003	0.0137	0.0000	165.8494	165.8494	0.0149	0.0000	166.2227
Vendor	2.7000e-004	8.2100e-003	2.1800e-003	2.0000e-005	4.8000e-004	4.0000e-005	5.2000e-004	1.4000e-004	4.0000e-005	1.8000e-004	0.0000	1.8998	1.8998	1.5000e-004	0.0000	1.9034
Worker	1.3300e-003	9.8000e-004	9.6300e-003	3.0000e-005	2.8900e-003	2.0000e-005	2.9100e-003	7.7000e-004	2.0000e-005	7.9000e-004	0.0000	2.6096	2.6096	8.0000e-005	0.0000	2.6115
Total	**0.0188**	**0.6209**	**0.1519**	**1.7200e-003**	**0.0471**	**1.9900e-003**	**0.0491**	**0.0127**	**1.9100e-003**	**0.0146**	**0.0000**	**170.3587**	**170.3587**	**0.0152**	**0.0000**	**170.7377**

3.5 Grading - 2021

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					0.0868	0.0000	0.0868	0.0213	0.0000	0.0213	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0189	0.2088	0.1390	2.8000e-004		8.9300e-003	8.9300e-003		8.2200e-003	8.2200e-003	0.0000	24.5227	24.5227	7.9300e-003	0.0000	24.7210
Total	**0.0189**	**0.2088**	**0.1390**	**2.8000e-004**	**0.0868**	**8.9300e-003**	**0.0957**	**0.0213**	**8.2200e-003**	**0.0296**	**0.0000**	**24.5227**	**24.5227**	**7.9300e-003**	**0.0000**	**24.7210**

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	4.0400e-003	0.1404	0.0346	4.1000e-004	0.0369	4.2000e-004	0.0373	9.3100e-003	4.1000e-004	9.7200e-003	0.0000	40.9448	40.9448	3.7000e-003	0.0000	41.0371
Vendor	6.0000e-005	1.8500e-003	4.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.4706	0.4706	3.0000e-005	0.0000	0.4715
Worker	3.1000e-004	2.2000e-004	2.2500e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6305	0.6305	2.0000e-005	0.0000	0.6309
Total	**4.4100e-003**	**0.1425**	**0.0374**	**4.2000e-004**	**0.0377**	**4.3000e-004**	**0.0381**	**9.5300e-003**	**4.1000e-004**	**9.9600e-003**	**0.0000**	**42.0458**	**42.0458**	**3.7500e-003**	**0.0000**	**42.1395**

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					0.0390	0.0000	0.0390	9.6000e-003	0.0000	9.6000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0189	0.2088	0.1390	2.8000e-004		8.9300e-003	8.9300e-003		8.2200e-003	8.2200e-003	0.0000	24.5227	24.5227	7.9300e-003	0.0000	24.7210
Total	**0.0189**	**0.2088**	**0.1390**	**2.8000e-004**	**0.0390**	**8.9300e-003**	**0.0480**	**9.6000e-003**	**8.2200e-003**	**0.0178**	**0.0000**	**24.5227**	**24.5227**	**7.9300e-003**	**0.0000**	**24.7210**

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	4.0400e-003	0.1404	0.0346	4.1000e-004	0.0369	4.2000e-004	0.0373	9.3100e-003	4.1000e-004	9.7200e-003	0.0000	40.9448	40.9448	3.7000e-003	0.0000	41.0371
Vendor	6.0000e-005	1.8500e-003	4.9000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.4706	0.4706	3.0000e-005	0.0000	0.4715
Worker	3.1000e-004	2.2000e-004	2.2500e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6305	0.6305	2.0000e-005	0.0000	0.6309
Total	**4.4100e-003**	**0.1425**	**0.0374**	**4.2000e-004**	**0.0377**	**4.3000e-004**	**0.0381**	**9.5300e-003**	**4.1000e-004**	**9.9600e-003**	**0.0000**	**42.0458**	**42.0458**	**3.7500e-003**	**0.0000**	**42.1395**

3.6 Pipeline Installation/Backfill - 2020

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	0.0107	0.1000	0.1157	1.9000e-004		5.5800e-003	5.5800e-003		5.3300e-003	5.3300e-003	0.0000	16.1470	16.1470	3.3400e-003	0.0000	16.2304
Total	**0.0107**	**0.1000**	**0.1157**	**1.9000e-004**	**0.0000**	**5.5800e-003**	**5.5800e-003**	**0.0000**	**5.3300e-003**	**5.3300e-003**	**0.0000**	**16.1470**	**16.1470**	**3.3400e-003**	**0.0000**	**16.2304**

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	2.8500e-003	7.6000e-004	1.0000e-005	1.7000e-004	1.0000e-005	1.8000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.6597	0.6597	5.0000e-005	0.0000	0.6609
Worker	1.8000e-004	1.4000e-004	1.3400e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3624	0.3624	1.0000e-005	0.0000	0.3627
Total	**2.8000e-004**	**2.9900e-003**	**2.1000e-003**	**1.0000e-005**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**1.6000e-004**	**1.0000e-005**	**1.7000e-004**	**0.0000**	**1.0221**	**1.0221**	**6.0000e-005**	**0.0000**	**1.0236**

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	0.0107	0.1000	0.1157	1.9000e-004		5.5800e-003	5.5800e-003		5.3300e-003	5.3300e-003	0.0000	16.1470	16.1470	3.3400e-003	0.0000	16.2304
Total	**0.0107**	**0.1000**	**0.1157**	**1.9000e-004**	**0.0000**	**5.5800e-003**	**5.5800e-003**	**0.0000**	**5.3300e-003**	**5.3300e-003**	**0.0000**	**16.1470**	**16.1470**	**3.3400e-003**	**0.0000**	**16.2304**

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	2.8500e-003	7.6000e-004	1.0000e-005	1.7000e-004	1.0000e-005	1.8000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.6597	0.6597	5.0000e-005	0.0000	0.6609
Worker	1.8000e-004	1.4000e-004	1.3400e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3624	0.3624	1.0000e-005	0.0000	0.3627
Total	**2.8000e-004**	**2.9900e-003**	**2.1000e-003**	**1.0000e-005**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**1.6000e-004**	**1.0000e-005**	**1.7000e-004**	**0.0000**	**1.0221**	**1.0221**	**6.0000e-005**	**0.0000**	**1.0236**

3.7 Pipeline Paving - 2020

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	8.4700e-003	0.1002	0.0593	1.3000e-004		4.2000e-003	4.2000e-003		3.8600e-003	3.8600e-003	0.0000	11.1289	11.1289	3.6000e-003	0.0000	11.2189
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.4700e-003**	**0.1002**	**0.0593**	**1.3000e-004**		**4.2000e-003**	**4.2000e-003**		**3.8600e-003**	**3.8600e-003**	**0.0000**	**11.1289**	**11.1289**	**3.6000e-003**	**0.0000**	**11.2189**

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	2.1700e-003	5.8000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.4000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.5013	0.5013	4.0000e-005	0.0000	0.5023
Worker	1.4000e-004	1.0000e-004	1.0200e-003	0.0000	3.0000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2755	0.2755	1.0000e-005	0.0000	0.2757
Total	**2.1000e-004**	**2.2700e-003**	**1.6000e-003**	**1.0000e-005**	**4.3000e-004**	**1.0000e-005**	**4.5000e-004**	**1.2000e-004**	**1.0000e-005**	**1.3000e-004**	**0.0000**	**0.7768**	**0.7768**	**5.0000e-005**	**0.0000**	**0.7780**

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	8.4700e-003	0.1002	0.0593	1.3000e-004		4.2000e-003	4.2000e-003		3.8600e-003	3.8600e-003	0.0000	11.1289	11.1289	3.6000e-003	0.0000	11.2188
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.4700e-003**	**0.1002**	**0.0593**	**1.3000e-004**		**4.2000e-003**	**4.2000e-003**		**3.8600e-003**	**3.8600e-003**	**0.0000**	**11.1289**	**11.1289**	**3.6000e-003**	**0.0000**	**11.2188**

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	2.1700e-003	5.8000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.4000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.5013	0.5013	4.0000e-005	0.0000	0.5023
Worker	1.4000e-004	1.0000e-004	1.0200e-003	0.0000	3.0000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2755	0.2755	1.0000e-005	0.0000	0.2757
Total	**2.1000e-004**	**2.2700e-003**	**1.6000e-003**	**1.0000e-005**	**4.3000e-004**	**1.0000e-005**	**4.5000e-004**	**1.2000e-004**	**1.0000e-005**	**1.3000e-004**	**0.0000**	**0.7768**	**0.7768**	**5.0000e-005**	**0.0000**	**0.7780**

3.7 Pipeline Paving - 2021

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	2.5000e-003	0.0294	0.0186	4.0000e-005		1.2000e-003	1.2000e-003		1.1100e-003	1.1100e-003	0.0000	3.5114	3.5114	1.1400e-003	0.0000	3.5398
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5000e-003**	**0.0294**	**0.0186**	**4.0000e-005**		**1.2000e-003**	**1.2000e-003**		**1.1100e-003**	**1.1100e-003**	**0.0000**	**3.5114**	**3.5114**	**1.1400e-003**	**0.0000**	**3.5398**

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	6.2000e-004	1.6000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1569	0.1569	1.0000e-005	0.0000	0.1572
Worker	4.0000e-005	3.0000e-005	3.0000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0841	0.0841	0.0000	0.0000	0.0841
Total	**6.0000e-005**	**6.5000e-004**	**4.6000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.2409**	**0.2409**	**1.0000e-005**	**0.0000**	**0.2413**

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	2.5000e-003	0.0294	0.0186	4.0000e-005		1.2000e-003	1.2000e-003		1.1100e-003	1.1100e-003	0.0000	3.5114	3.5114	1.1400e-003	0.0000	3.5398
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5000e-003**	**0.0294**	**0.0186**	**4.0000e-005**		**1.2000e-003**	**1.2000e-003**		**1.1100e-003**	**1.1100e-003**	**0.0000**	**3.5114**	**3.5114**	**1.1400e-003**	**0.0000**	**3.5398**

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	6.2000e-004	1.6000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1569	0.1569	1.0000e-005	0.0000	0.1572
Worker	4.0000e-005	3.0000e-005	3.0000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0841	0.0841	0.0000	0.0000	0.0841
Total	**6.0000e-005**	**6.5000e-004**	**4.6000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.2409**	**0.2409**	**1.0000e-005**	**0.0000**	**0.2413**

3.8 Building Construction - 2021

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	0.2395	2.1964	2.0885	3.3900e-003		0.1208	0.1208		0.1136	0.1136	0.0000	291.8630	291.8630	0.0704	0.0000	293.6233
Total	**0.2395**	**2.1964**	**2.0885**	**3.3900e-003**		**0.1208**	**0.1208**		**0.1136**	**0.1136**	**0.0000**	**291.8630**	**291.8630**	**0.0704**	**0.0000**	**293.6233**

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	0.0195	0.6474	0.1727	1.6900e-003	0.0418	1.3700e-003	0.0432	0.0121	1.3100e-003	0.0134	0.0000	164.7072	164.7072	0.0122	0.0000	165.0128
Worker	0.0762	0.0544	0.5477	1.7000e-003	0.1758	1.2400e-003	0.1771	0.0467	1.1500e-003	0.0479	0.0000	153.5826	153.5826	4.4000e-003	0.0000	153.6926
Total	**0.0957**	**0.7018**	**0.7204**	**3.3900e-003**	**0.2176**	**2.6100e-003**	**0.2203**	**0.0588**	**2.4600e-003**	**0.0612**	**0.0000**	**318.2898**	**318.2898**	**0.0166**	**0.0000**	**318.7055**

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	0.2395	2.1964	2.0885	3.3900e-003		0.1208	0.1208		0.1136	0.1136	0.0000	291.8626	291.8626	0.0704	0.0000	293.6230
Total	**0.2395**	**2.1964**	**2.0885**	**3.3900e-003**		**0.1208**	**0.1208**		**0.1136**	**0.1136**	**0.0000**	**291.8626**	**291.8626**	**0.0704**	**0.0000**	**293.6230**

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	0.0195	0.6474	0.1727	1.6900e-003	0.0418	1.3700e-003	0.0432	0.0121	1.3100e-003	0.0134	0.0000	164.7072	164.7072	0.0122	0.0000	165.0128
Worker	0.0762	0.0544	0.5477	1.7000e-003	0.1758	1.2400e-003	0.1771	0.0467	1.1500e-003	0.0479	0.0000	153.5826	153.5826	4.4000e-003	0.0000	153.6926
Total	**0.0957**	**0.7018**	**0.7204**	**3.3900e-003**	**0.2176**	**2.6100e-003**	**0.2203**	**0.0588**	**2.4600e-003**	**0.0612**	**0.0000**	**318.2898**	**318.2898**	**0.0166**	**0.0000**	**318.7055**

3.8 Building Construction - 2022

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	0.1604	1.4679	1.5382	2.5300e-003		0.0761	0.0761		0.0716	0.0716	0.0000	217.8217	217.8217	0.0522	0.0000	219.1263
Total	**0.1604**	**1.4679**	**1.5382**	**2.5300e-003**		**0.0761**	**0.0761**		**0.0716**	**0.0716**	**0.0000**	**217.8217**	**217.8217**	**0.0522**	**0.0000**	**219.1263**

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	0.0135	0.4561	0.1220	1.2500e-003	0.0312	8.8000e-004	0.0321	9.0100e-003	8.4000e-004	9.8500e-003	0.0000	121.7132	121.7132	8.8300e-003	0.0000	121.9340
Worker	0.0538	0.0370	0.3794	1.2200e-003	0.1312	9.1000e-004	0.1321	0.0349	8.4000e-004	0.0357	0.0000	110.3773	110.3773	3.0100e-003	0.0000	110.4525
Total	**0.0673**	**0.4931**	**0.5013**	**2.4700e-003**	**0.1624**	**1.7900e-003**	**0.1642**	**0.0439**	**1.6800e-003**	**0.0455**	**0.0000**	**232.0905**	**232.0905**	**0.0118**	**0.0000**	**232.3866**

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	0.1604	1.4679	1.5382	2.5300e-003		0.0761	0.0761		0.0716	0.0716	0.0000	217.8215	217.8215	0.0522	0.0000	219.1261
Total	**0.1604**	**1.4679**	**1.5382**	**2.5300e-003**		**0.0761**	**0.0761**		**0.0716**	**0.0716**	**0.0000**	**217.8215**	**217.8215**	**0.0522**	**0.0000**	**219.1261**

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	0.0135	0.4561	0.1220	1.2500e-003	0.0312	8.8000e-004	0.0321	9.0100e-003	8.4000e-004	9.8500e-003	0.0000	121.7132	121.7132	8.8300e-003	0.0000	121.9340
Worker	0.0538	0.0370	0.3794	1.2200e-003	0.1312	9.1000e-004	0.1321	0.0349	8.4000e-004	0.0357	0.0000	110.3773	110.3773	3.0100e-003	0.0000	110.4525
Total	**0.0673**	**0.4931**	**0.5013**	**2.4700e-003**	**0.1624**	**1.7900e-003**	**0.1642**	**0.0439**	**1.6800e-003**	**0.0455**	**0.0000**	**232.0905**	**232.0905**	**0.0118**	**0.0000**	**232.3866**

3.9 Architectural Coating - 2021

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	0.5846					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0207	0.1443	0.1718	2.8000e-004		8.8900e-003	8.8900e-003		8.8900e-003	8.8900e-003	0.0000	24.1283	24.1283	1.6600e-003	0.0000	24.1696
Total	**0.6052**	**0.1443**	**0.1718**	**2.8000e-004**		**8.8900e-003**	**8.8900e-003**		**8.8900e-003**	**8.8900e-003**	**0.0000**	**24.1283**	**24.1283**	**1.6600e-003**	**0.0000**	**24.1696**

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	1.1700e-003	0.0389	0.0104	1.0000e-004	2.5100e-003	8.0000e-005	2.5900e-003	7.2000e-004	8.0000e-005	8.0000e-004	0.0000	9.8824	9.8824	7.3000e-004	0.0000	9.9008
Worker	0.0118	8.4400e-003	0.0850	2.6000e-004	0.0273	1.9000e-004	0.0275	7.2500e-003	1.8000e-004	7.4300e-003	0.0000	23.8318	23.8318	6.8000e-004	0.0000	23.8489
Total	**0.0130**	**0.0473**	**0.0954**	**3.6000e-004**	**0.0298**	**2.7000e-004**	**0.0301**	**7.9700e-003**	**2.6000e-004**	**8.2300e-003**	**0.0000**	**33.7142**	**33.7142**	**1.4100e-003**	**0.0000**	**33.7496**

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	0.5846					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0207	0.1443	0.1718	2.8000e-004		8.8900e-003	8.8900e-003		8.8900e-003	8.8900e-003	0.0000	24.1282	24.1282	1.6600e-003	0.0000	24.1696
Total	**0.6052**	**0.1443**	**0.1718**	**2.8000e-004**		**8.8900e-003**	**8.8900e-003**		**8.8900e-003**	**8.8900e-003**	**0.0000**	**24.1282**	**24.1282**	**1.6600e-003**	**0.0000**	**24.1696**

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	1.1700e-003	0.0389	0.0104	1.0000e-004	2.5100e-003	8.0000e-005	2.5900e-003	7.2000e-004	8.0000e-005	8.0000e-004	0.0000	9.8824	9.8824	7.3000e-004	0.0000	9.9008
Worker	0.0118	8.4400e-003	0.0850	2.6000e-004	0.0273	1.9000e-004	0.0275	7.2500e-003	1.8000e-004	7.4300e-003	0.0000	23.8318	23.8318	6.8000e-004	0.0000	23.8489
Total	**0.0130**	**0.0473**	**0.0954**	**3.6000e-004**	**0.0298**	**2.7000e-004**	**0.0301**	**7.9700e-003**	**2.6000e-004**	**8.2300e-003**	**0.0000**	**33.7142**	**33.7142**	**1.4100e-003**	**0.0000**	**33.7496**

3.9 Architectural Coating - 2022

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	0.6928					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0229	0.1578	0.2031	3.3000e-004		9.1500e-003	9.1500e-003		9.1500e-003	9.1500e-003	0.0000	28.5964	28.5964	1.8600e-003	0.0000	28.6430
Total	**0.7157**	**0.1578**	**0.2031**	**3.3000e-004**		**9.1500e-003**	**9.1500e-003**		**9.1500e-003**	**9.1500e-003**	**0.0000**	**28.5964**	**28.5964**	**1.8600e-003**	**0.0000**	**28.6430**

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	1.2900e-003	0.0435	0.0116	1.2000e-004	2.9700e-003	8.0000e-005	3.0600e-003	8.6000e-004	8.0000e-005	9.4000e-004	0.0000	11.6016	11.6016	8.4000e-004	0.0000	11.6227
Worker	0.0133	9.1200e-003	0.0935	3.0000e-004	0.0323	2.2000e-004	0.0326	8.5900e-003	2.1000e-004	8.8000e-003	0.0000	27.2097	27.2097	7.4000e-004	0.0000	27.2282
Total	**0.0146**	**0.0526**	**0.1051**	**4.2000e-004**	**0.0353**	**3.0000e-004**	**0.0356**	**9.4500e-003**	**2.9000e-004**	**9.7400e-003**	**0.0000**	**38.8113**	**38.8113**	**1.5800e-003**	**0.0000**	**38.8509**

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	0.6928					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0229	0.1578	0.2031	3.3000e-004		9.1500e-003	9.1500e-003		9.1500e-003	9.1500e-003	0.0000	28.5964	28.5964	1.8600e-003	0.0000	28.6430
Total	**0.7157**	**0.1578**	**0.2031**	**3.3000e-004**		**9.1500e-003**	**9.1500e-003**		**9.1500e-003**	**9.1500e-003**	**0.0000**	**28.5964**	**28.5964**	**1.8600e-003**	**0.0000**	**28.6430**

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	1.2900e-003	0.0435	0.0116	1.2000e-004	2.9700e-003	8.0000e-005	3.0600e-003	8.6000e-004	8.0000e-005	9.4000e-004	0.0000	11.6016	11.6016	8.4000e-004	0.0000	11.6227
Worker	0.0133	9.1200e-003	0.0935	3.0000e-004	0.0323	2.2000e-004	0.0326	8.5900e-003	2.1000e-004	8.8000e-003	0.0000	27.2097	27.2097	7.4000e-004	0.0000	27.2282
Total	**0.0146**	**0.0526**	**0.1051**	**4.2000e-004**	**0.0353**	**3.0000e-004**	**0.0356**	**9.4500e-003**	**2.9000e-004**	**9.7400e-003**	**0.0000**	**38.8113**	**38.8113**	**1.5800e-003**	**0.0000**	**38.8509**

3.10 Paving - 2022

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	0.0193	0.1947	0.2552	4.0000e-004		9.9400e-003	9.9400e-003		9.1400e-003	9.1400e-003	0.0000	35.0482	35.0482	0.0113	0.0000	35.3316
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0193**	**0.1947**	**0.2552**	**4.0000e-004**		**9.9400e-003**	**9.9400e-003**		**9.1400e-003**	**9.1400e-003**	**0.0000**	**35.0482**	**35.0482**	**0.0113**	**0.0000**	**35.3316**

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-004	6.7900e-003	1.8200e-003	2.0000e-005	4.6000e-004	1.0000e-005	4.8000e-004	1.3000e-004	1.0000e-005	1.5000e-004	0.0000	1.8128	1.8128	1.3000e-004	0.0000	1.8160
Worker	9.2000e-004	6.3000e-004	6.4900e-003	2.0000e-005	2.2500e-003	2.0000e-005	2.2600e-003	6.0000e-004	1.0000e-005	6.1000e-004	0.0000	1.8896	1.8896	5.0000e-005	0.0000	1.8909
Total	**1.1200e-003**	**7.4200e-003**	**8.3100e-003**	**4.0000e-005**	**2.7100e-003**	**3.0000e-005**	**2.7400e-003**	**7.3000e-004**	**2.0000e-005**	**7.6000e-004**	**0.0000**	**3.7023**	**3.7023**	**1.8000e-004**	**0.0000**	**3.7069**

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	0.0193	0.1947	0.2552	4.0000e-004		9.9400e-003	9.9400e-003		9.1400e-003	9.1400e-003	0.0000	35.0482	35.0482	0.0113	0.0000	35.3316
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0193**	**0.1947**	**0.2552**	**4.0000e-004**		**9.9400e-003**	**9.9400e-003**		**9.1400e-003**	**9.1400e-003**	**0.0000**	**35.0482**	**35.0482**	**0.0113**	**0.0000**	**35.3316**

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-004	6.7900e-003	1.8200e-003	2.0000e-005	4.6000e-004	1.0000e-005	4.8000e-004	1.3000e-004	1.0000e-005	1.5000e-004	0.0000	1.8128	1.8128	1.3000e-004	0.0000	1.8160
Worker	9.2000e-004	6.3000e-004	6.4900e-003	2.0000e-005	2.2500e-003	2.0000e-005	2.2600e-003	6.0000e-004	1.0000e-005	6.1000e-004	0.0000	1.8896	1.8896	5.0000e-005	0.0000	1.8909
Total	**1.1200e-003**	**7.4200e-003**	**8.3100e-003**	**4.0000e-005**	**2.7100e-003**	**3.0000e-005**	**2.7400e-003**	**7.3000e-004**	**2.0000e-005**	**7.6000e-004**	**0.0000**	**3.7023**	**3.7023**	**1.8000e-004**	**0.0000**	**3.7069**

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	0.3884	1.5571	4.7312	0.0172	1.5785	0.0133	1.5917	0.4227	0.0124	0.4350	0.0000	1,586.5913	1,586.5913	0.0796	0.0000	1,588.5812
Unmitigated	0.3884	1.5571	4.7312	0.0172	1.5785	0.0133	1.5917	0.4227	0.0124	0.4350	0.0000	1,586.5913	1,586.5913	0.0796	0.0000	1,588.5812

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	132.00	179.08	179.08	412,436	412,436
Condo/Townhouse	648.00	659.34	659.34	1,846,630	1,846,630
Enclosed Parking with Elevator	0.00	0.00	0.00		
Hotel	520.00	682.50	682.50	1,606,142	1,606,142
Motel	60.00	81.40	81.40	187,471	187,471
Single Family Housing	48.00	48.00	48.00	136,107	136,107
Total	1,408.00	1,650.32	1,650.32	4,188,786	4,188,786

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-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	7.79	7.79	7.79	41.00	19.00	40.00	100	0	0
Condo/Townhouse	7.79	7.79	7.79	41.00	19.00	40.00	100	0	0
Enclosed Parking with Elevator	7.79	7.79	7.79	0.00	0.00	0.00	0	0	0
Hotel	7.79	7.79	7.79	19.40	61.60	19.00	100	0	0
Motel	7.79	7.79	7.79	19.00	62.00	19.00	100	0	0
Single Family Housing	7.79	7.79	7.79	41.00	19.00	40.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Condo/Townhouse	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Enclosed Parking with Elevator	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Hotel	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Motel	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Single Family Housing	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Kilowatt Hours of Renewable Electricity Generated

	ROG	NOx	CO	SO2	Fugitive 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	253.8944	253.8944	0.0164	3.4000e-003	255.3176
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	460.6967	460.6967	0.0298	6.1700e-003	463.2792
NaturalGas Mitigated	0.0957	0.8370	0.4911	5.2200e-003		0.0661	0.0661		0.0661	0.0661	0.0000	946.7185	946.7185	0.0182	0.0174	952.3444
NaturalGas Unmitigated	0.0957	0.8370	0.4911	5.2200e-003		0.0661	0.0661		0.0661	0.0661	0.0000	946.7185	946.7185	0.0182	0.0174	952.3444

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					
Apartments Low Rise	150000	8.1000e-004	6.9100e-003	2.9400e-003	4.0000e-005		5.6000e-004	5.6000e-004		5.6000e-004	5.6000e-004	0.0000	8.0046	8.0046	1.5000e-004	1.5000e-004	8.0522
Condo/Townhouse	7.1e+006	0.0383	0.3272	0.1392	2.0900e-003		0.0265	0.0265		0.0265	0.0265	0.0000	378.8830	378.8830	7.2600e-003	6.9500e-003	381.1346
Enclosed Parking with Elevator	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
Hotel	6.56081e+006	0.0354	0.3216	0.2702	1.9300e-003		0.0244	0.0244		0.0244	0.0244	0.0000	350.1097	350.1097	6.7100e-003	6.4200e-003	352.1903
Motel	80026.1	4.3000e-004	3.9200e-003	3.3000e-003	2.0000e-005		3.0000e-004	3.0000e-004		3.0000e-004	3.0000e-004	0.0000	4.2705	4.2705	8.0000e-005	8.0000e-005	4.2959
Single Family Housing	3.85e+006	0.0208	0.1774	0.0755	1.1300e-003		0.0143	0.0143		0.0143	0.0143	0.0000	205.4507	205.4507	3.9400e-003	3.7700e-003	206.6716
Total		**0.0957**	**0.8370**	**0.4911**	**5.2100e-003**		**0.0661**	**0.0661**		**0.0661**	**0.0661**	**0.0000**	**946.7185**	**946.7185**	**0.0181**	**0.0174**	**952.3444**

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					
Apartments Low Rise	150000	8.1000e-004	6.9100e-003	2.9400e-003	4.0000e-005		5.6000e-004	5.6000e-004		5.6000e-004	5.6000e-004	0.0000	8.0046	8.0046	1.5000e-004	1.5000e-004	8.0522
Condo/Townhouse	7.1e+006	0.0383	0.3272	0.1392	2.0900e-003		0.0265	0.0265		0.0265	0.0265	0.0000	378.8830	378.8830	7.2600e-003	6.9500e-003	381.1346
Enclosed Parking with Elevator	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
Hotel	6.56081e+006	0.0354	0.3216	0.2702	1.9300e-003		0.0244	0.0244		0.0244	0.0244	0.0000	350.1097	350.1097	6.7100e-003	6.4200e-003	352.1903
Motel	80026.1	4.3000e-004	3.9200e-003	3.3000e-003	2.0000e-005		3.0000e-004	3.0000e-004		3.0000e-004	3.0000e-004	0.0000	4.2705	4.2705	8.0000e-005	8.0000e-005	4.2959
Single Family Housing	3.85e+006	0.0208	0.1774	0.0755	1.1300e-003		0.0143	0.0143		0.0143	0.0143	0.0000	205.4507	205.4507	3.9400e-003	3.7700e-003	206.6716
Total		**0.0957**	**0.8370**	**0.4911**	**5.2100e-003**		**0.0661**	**0.0661**		**0.0661**	**0.0661**	**0.0000**	**946.7185**	**946.7185**	**0.0181**	**0.0174**	**952.3444**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	69999.8	14.2342	9.2000e-004	1.9000e-004	14.3139
Condo/Townhouse	718000	146.0021	9.4400e-003	1.9500e-003	146.8205
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Hotel	1.23056e+006	250.2294	0.0162	3.3500e-003	251.6321
Motel	69023.4	14.0356	9.1000e-004	1.9000e-004	14.1143
Single Family Housing	178000	36.1955	2.3400e-003	4.8000e-004	36.3984
Total		**460.6967**	**0.0298**	**6.1600e-003**	**463.2792**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	-99500.2	-20.2329	-0.0013	-0.0003	-20.3463
Condo/Townhouse	548500	111.5350	7.2200e-003	1.4900e-003	112.1603
Enclosed Parking with Elevator	-169500	-34.4671	-0.0022	-0.0005	-34.6603
Hotel	1.06106e+006	215.7623	0.0140	2.8900e-003	216.9718
Motel	-100477	-20.4315	-0.0013	-0.0003	-20.5460
Single Family Housing	8500	1.7284	1.1000e-004	2.0000e-005	1.7381
Total		**253.8944**	**0.0164**	**3.4000e-003**	**255.3176**

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	tons/yr										MT/yr					
Mitigated	1.5553	0.1289	0.8472	8.1000e-004		0.0141	0.0141		0.0141	0.0141	0.0000	139.9272	139.9272	3.9100e-003	2.5400e-003	140.7823
Unmitigated	1.5553	0.1289	0.8472	8.1000e-004		0.0141	0.0141		0.0141	0.0141	0.0000	139.9272	139.9272	3.9100e-003	2.5400e-003	140.7823

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	0.1277					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.3894					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0140	0.1197	0.0509	7.6000e-004		9.6800e-003	9.6800e-003		9.6800e-003	9.6800e-003	0.0000	138.6264	138.6264	2.6600e-003	2.5400e-003	139.4502
Landscaping	0.0241	9.1700e-003	0.7962	4.0000e-005		4.4000e-003	4.4000e-003		4.4000e-003	4.4000e-003	0.0000	1.3008	1.3008	1.2600e-003	0.0000	1.3322
Total	**1.5553**	**0.1289**	**0.8472**	**8.0000e-004**		**0.0141**	**0.0141**		**0.0141**	**0.0141**	**0.0000**	**139.9272**	**139.9272**	**3.9200e-003**	**2.5400e-003**	**140.7823**

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	0.1277					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.3894					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0140	0.1197	0.0509	7.6000e-004		9.6800e-003	9.6800e-003		9.6800e-003	9.6800e-003	0.0000	138.6264	138.6264	2.6600e-003	2.5400e-003	139.4502
Landscaping	0.0241	9.1700e-003	0.7962	4.0000e-005		4.4000e-003	4.4000e-003		4.4000e-003	4.4000e-003	0.0000	1.3008	1.3008	1.2600e-003	0.0000	1.3322
Total	**1.5553**	**0.1289**	**0.8472**	**8.0000e-004**		**0.0141**	**0.0141**		**0.0141**	**0.0141**	**0.0000**	**139.9272**	**139.9272**	**3.9200e-003**	**2.5400e-003**	**140.7823**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	46.7876	0.0200	0.0115	50.7086
Unmitigated	46.7876	0.0200	0.0115	50.7086

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	0 / 0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Hotel	14.1951 / 1.85029	46.7876	0.0200	0.0115	50.7086
Motel	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**46.7876**	**0.0200**	**0.0115**	**50.7086**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	0 / 0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Hotel	14.1951 / 1.85029	46.7876	0.0200	0.0115	50.7086
Motel	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**46.7876**	**0.0200**	**0.0115**	**50.7086**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	9.4340	0.5575	0.0000	23.3724
Unmitigated	18.8680	1.1151	0.0000	46.7447

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	10.12	2.0543	0.1214	0.0000	5.0894
Condo/Townhouse	37.26	7.5634	0.4470	0.0000	18.7381
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Hotel	35.59	7.2245	0.4270	0.0000	17.8983
Motel	5.47	1.1104	0.0656	0.0000	2.7509
Single Family Housing	4.51	0.9155	0.0541	0.0000	2.2681
Total		**18.8680**	**1.1151**	**0.0000**	**46.7447**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	5.06	1.0271	0.0607	0.0000	2.5447
Condo/Townhouse	18.63	3.7817	0.2235	0.0000	9.3691
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Hotel	17.795	3.6122	0.2135	0.0000	8.9491
Motel	2.735	0.5552	0.0328	0.0000	1.3754
Single Family Housing	2.255	0.4577	0.0271	0.0000	1.1340
Total		**9.4340**	**0.5575**	**0.0000**	**23.3724**

CalEEMod Version: CalEEMod.2016.3.2

Date: 10/16/2019 9:28 AM

Marsol Project
San Diego County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	93.34	1000sqft	0.00	93,340.00	0
Hotel	65.00	Room	0.00	131,611.00	0
Motel	10.00	Room	0.00	6,834.00	0
Apartments Low Rise	22.00	Dwelling Unit	0.00	16,174.00	63
Condo/Townhouse	81.00	Dwelling Unit	14.86	171,599.00	232
Single Family Housing	4.00	Dwelling Unit	0.00	28,000.00	11

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2023
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	448.3	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 100% of remaining electricty purchased from CCA or equivalent program

Land Use - Applicant specific information. Total site acreage included in residential uses. User Defined Res = Affordable Housing and Motel = Market Rate Hotel.

Construction Phase - Architectural coating to occur concurrently with building and paving. Demolition concurrent with site preperation.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - For pipeline work.

Off-road Equipment - For pipeline work.

Off-road Equipment - For pipeline work.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Added 2 trenchers for pipeline work.

Trips and VMT - Rounded worker and vendor trips to reflect round trips.

Demolition - Demolition of 5,800 SF building.

Grading - 43,000 CY of soil exported.

Architectural Coating - Del Mar Sustainability Plan

Vehicle Trips - LLG 2019

Woodstoves - No woodstoves or wood burning fireplaces. 166 natural gas fireplaces for hotel and residential uses and 10 fire pits.

Area Coating - Del Mar Sustainability Plan

Energy Use - Glumac 2019

Water And Wastewater - Glumac 2019

Construction Off-road Equipment Mitigation -

Energy Mitigation - 1,017,000 kWh of renewables energy from installation of PVs.

Waste Mitigation - AB 341

Table Name	Column Name	Default Value	New Value
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tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaCoating	Area_EF_Nonresidential_Interior	250	50
tblAreaCoating	Area_EF_Residential_Exterior	250	100
tblAreaCoating	Area_EF_Residential_Interior	250	50

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tblLandUse	LandUseSquareFeet	19,602.00	6,834.00
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tblLandUse	LandUseSquareFeet	81,000.00	171,599.00
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tblLandUse	LotAcreage	5.06	14.86

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
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tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	1,433,388.56	0.00
tblWater	IndoorWaterUseRate	5,277,476.08	0.00
tblWater	IndoorWaterUseRate	1,648,840.05	14,195,111.73

tblWater	IndoorWaterUseRate	253,667.70	0.00
tblWater	IndoorWaterUseRate	260,616.10	0.00
tblWater	OutdoorWaterUseRate	903,658.01	0.00
tblWater	OutdoorWaterUseRate	3,327,104.48	0.00
tblWater	OutdoorWaterUseRate	183,204.45	1,850,288.27
tblWater	OutdoorWaterUseRate	28,185.30	0.00
tblWater	OutdoorWaterUseRate	164,301.46	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	1.10	0.00
tblWoodstoves	NumberCatalytic	4.05	0.00
tblWoodstoves	NumberCatalytic	0.20	0.00
tblWoodstoves	NumberNoncatalytic	1.10	0.00
tblWoodstoves	NumberNoncatalytic	4.05	0.00
tblWoodstoves	NumberNoncatalytic	0.20	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

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					
2020	7.9754	106.3537	59.9005	0.1951	18.6298	3.8611	22.6893	10.0590	3.5681	13.8256	0.0000	20,065.7799	20,065.7799	3.6188	0.0000	20,156.2487
2021	9.1952	87.4771	45.3515	0.1711	17.3166	2.4826	19.7991	5.7834	2.2874	8.0708	0.0000	17,770.6096	17,770.6096	3.2706	0.0000	17,852.3749
2022	8.9350	22.6510	24.6836	0.0609	2.0907	0.9123	3.0030	0.5628	0.8631	1.4259	0.0000	6,041.8715	6,041.8715	0.7840	0.0000	6,061.4712
Maximum	**9.1952**	**106.3537**	**59.9005**	**0.1951**	**18.6298**	**3.8611**	**22.6893**	**10.0590**	**3.5681**	**13.8256**	**0.0000**	**20,065.7799**	**20,065.7799**	**3.6188**	**0.0000**	**20,156.2487**

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					
2020	7.9754	106.3537	59.9005	0.1951	8.5874	3.8611	12.6469	4.5810	3.5681	8.3476	0.0000	20,065.7799	20,065.7799	3.6188	0.0000	20,156.2487
2021	9.1952	87.4771	45.3515	0.1711	12.5462	2.4826	15.0288	3.8053	2.2874	6.0927	0.0000	17,770.6096	17,770.6096	3.2706	0.0000	17,852.3749
2022	8.9350	22.6510	24.6836	0.0609	2.0907	0.9123	3.0030	0.5628	0.8631	1.4259	0.0000	6,041.8715	6,041.8715	0.7840	0.0000	6,061.4712
Maximum	**9.1952**	**106.3537**	**59.9005**	**0.1951**	**12.5462**	**3.8611**	**15.0288**	**4.5810**	**3.5681**	**8.3476**	**0.0000**	**20,065.7799**	**20,065.7799**	**3.6188**	**0.0000**	**20,156.2487**

	ROG	NOx	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**	**38.94**	**0.00**	**32.56**	**45.45**	**0.00**	**31.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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	8.9225	3.0215	10.0891	0.0191		0.2850	0.2850		0.2850	0.2850	0.0000	3,742.9908	3,742.9908	0.0868	0.0683	3,765.5234
Energy	0.5242	4.5863	2.6909	0.0286		0.3622	0.3622		0.3622	0.3622		5,718.2384	5,718.2384	0.1096	0.1048	5,752.2190
Mobile	2.5221	9.2645	29.9847	0.1101	9.9218	0.0815	10.0033	2.6516	0.0759	2.7274		11,208.3184	11,208.3184	0.5426		11,221.8833
Total	**11.9687**	**16.8723**	**42.7648**	**0.1578**	**9.9218**	**0.7286**	**10.6505**	**2.6516**	**0.7230**	**3.3746**	**0.0000**	**20,669.5475**	**20,669.5475**	**0.7390**	**0.1732**	**20,739.6257**

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	8.9225	3.0215	10.0891	0.0191		0.2850	0.2850		0.2850	0.2850	0.0000	3,742.9908	3,742.9908	0.0868	0.0683	3,765.5234
Energy	0.5242	4.5863	2.6909	0.0286		0.3622	0.3622		0.3622	0.3622		5,718.2384	5,718.2384	0.1096	0.1048	5,752.2190
Mobile	2.5221	9.2645	29.9847	0.1101	9.9218	0.0815	10.0033	2.6516	0.0759	2.7274		11,208.3184	11,208.3184	0.5426		11,221.8833
Total	**11.9687**	**16.8723**	**42.7648**	**0.1578**	**9.9218**	**0.7286**	**10.6505**	**2.6516**	**0.7230**	**3.3746**	**0.0000**	**20,669.5475**	**20,669.5475**	**0.7390**	**0.1732**	**20,739.6257**

	ROG	NOx	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	Demolition	Demolition	10/1/2020	11/11/2020	5	30	
2	Site Preparation	Site Preparation	10/1/2020	11/11/2020	5	30	
3	Pipeline Site Preparation	Site Preparation	11/12/2020	12/9/2020	5	20	For Pipeline
4	Grading	Grading	11/12/2020	1/13/2021	5	45	
5	Pipeline Installation/Backfill	Grading	11/23/2020	12/25/2020	5	25	For Pipeline
6	Pipeline Paving	Paving	12/7/2020	1/8/2021	5	25	For Pipeline
7	Building Construction	Building Construction	1/14/2021	9/21/2022	5	440	
8	Architectural Coating	Architectural Coating	4/13/2021	11/10/2022	5	413	
9	Paving	Paving	9/22/2022	11/9/2022	5	35	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 0

Residential Indoor: 436,940; Residential Outdoor: 145,647; Non-Residential Indoor: 207,668; Non-Residential Outdoor: 69,223; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Pipeline Site Preparation	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Pipeline Installation/Backfill	Excavators	1	8.00	158	0.38
Pipeline Installation/Backfill	Generator Sets	1	8.00	84	0.74
Pipeline Installation/Backfill	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Pipeline Paving	Graders	1	8.00	187	0.41
Pipeline Paving	Paving Equipment	1	8.00	132	0.36
Pipeline Paving	Rollers	1	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	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
Demolition	6	16.00	0.00	26.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pipeline Site Preparation	1	6.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	4.00	5,376.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pipeline Installation/Backfill	3	4.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pipeline Paving	3	4.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	174.00	50.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	36.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	16.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2020

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					0.1927	0.0000	0.1927	0.0292	0.0000	0.0292			0.0000			0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.1927**	**1.6587**	**1.8514**	**0.0292**	**1.5419**	**1.5710**		**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

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	6.8500e-003	0.2418	0.0549	6.8000e-004	0.0151	7.7000e-004	0.0159	4.1500e-003	7.4000e-004	4.8900e-003		74.2150	74.2150	6.5400e-003		74.3784
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
Worker	0.0587	0.0396	0.4535	1.3500e-003	0.1314	9.2000e-004	0.1324	0.0349	8.5000e-004	0.0357		134.8395	134.8395	4.0300e-003		134.9402
Total	**0.0656**	**0.2813**	**0.5084**	**2.0300e-003**	**0.1466**	**1.6900e-003**	**0.1483**	**0.0390**	**1.5900e-003**	**0.0406**		**209.0545**	**209.0545**	**0.0106**		**209.3186**

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					0.0867	0.0000	0.0867	0.0131	0.0000	0.0131			0.0000			0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0867**	**1.6587**	**1.7454**	**0.0131**	**1.5419**	**1.5550**	**0.0000**	**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

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	6.8500e-003	0.2418	0.0549	6.8000e-004	0.0151	7.7000e-004	0.0159	4.1500e-003	7.4000e-004	4.8900e-003		74.2150	74.2150	6.5400e-003		74.3784
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
Worker	0.0587	0.0396	0.4535	1.3500e-003	0.1314	9.2000e-004	0.1324	0.0349	8.5000e-004	0.0357		134.8395	134.8395	4.0300e-003		134.9402
Total	**0.0656**	**0.2813**	**0.5084**	**2.0300e-003**	**0.1466**	**1.6900e-003**	**0.1483**	**0.0390**	**1.5900e-003**	**0.0406**		**209.0545**	**209.0545**	**0.0106**		**209.3186**

3.3 Site Preparation - 2020

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

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
Vendor	0.0150	0.4510	0.1149	1.1000e-003	0.0271	2.2100e-003	0.0293	7.8000e-003	2.1100e-003	9.9100e-003		117.6160	117.6160	8.6800e-003		117.8330
Worker	0.0661	0.0445	0.5102	1.5200e-003	0.1479	1.0400e-003	0.1489	0.0392	9.6000e-004	0.0402		151.6945	151.6945	4.5300e-003		151.8077
Total	**0.0810**	**0.4955**	**0.6251**	**2.6200e-003**	**0.1750**	**3.2500e-003**	**0.1782**	**0.0470**	**3.0700e-003**	**0.0501**		**269.3105**	**269.3105**	**0.0132**		**269.6407**

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					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**8.1298**	**2.1974**	**10.3272**	**4.4688**	**2.0216**	**6.4904**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

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
Vendor	0.0150	0.4510	0.1149	1.1000e-003	0.0271	2.2100e-003	0.0293	7.8000e-003	2.1100e-003	9.9100e-003		117.6160	117.6160	8.6800e-003		117.8330
Worker	0.0661	0.0445	0.5102	1.5200e-003	0.1479	1.0400e-003	0.1489	0.0392	9.6000e-004	0.0402		151.6945	151.6945	4.5300e-003		151.8077
Total	**0.0810**	**0.4955**	**0.6251**	**2.6200e-003**	**0.1750**	**3.2500e-003**	**0.1782**	**0.0470**	**3.0700e-003**	**0.0501**		**269.3105**	**269.3105**	**0.0132**		**269.6407**

3.4 Pipeline Site Preparation - 2020

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	0.4182	3.2986	3.6866	6.2600e-003		0.1982	0.1982		0.1982	0.1982		592.6646	592.6646	0.0375		593.6032
Total	**0.4182**	**3.2986**	**3.6866**	**6.2600e-003**	**0.0000**	**0.1982**	**0.1982**	**0.0000**	**0.1982**	**0.1982**		**592.6646**	**592.6646**	**0.0375**		**593.6032**

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
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
Worker	0.0220	0.0148	0.1701	5.1000e-004	0.0493	3.5000e-004	0.0496	0.0131	3.2000e-004	0.0134		50.5648	50.5648	1.5100e-003		50.6026
Total	**0.0220**	**0.0148**	**0.1701**	**5.1000e-004**	**0.0493**	**3.5000e-004**	**0.0496**	**0.0131**	**3.2000e-004**	**0.0134**		**50.5648**	**50.5648**	**1.5100e-003**		**50.6026**

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	0.4182	3.2986	3.6866	6.2600e-003		0.1982	0.1982		0.1982	0.1982	0.0000	592.6646	592.6646	0.0375		593.6032
Total	**0.4182**	**3.2986**	**3.6866**	**6.2600e-003**	**0.0000**	**0.1982**	**0.1982**	**0.0000**	**0.1982**	**0.1982**	**0.0000**	**592.6646**	**592.6646**	**0.0375**		**593.6032**

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
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
Worker	0.0220	0.0148	0.1701	5.1000e-004	0.0493	3.5000e-004	0.0496	0.0131	3.2000e-004	0.0134		50.5648	50.5648	1.5100e-003		50.6026
Total	**0.0220**	**0.0148**	**0.1701**	**5.1000e-004**	**0.0493**	**3.5000e-004**	**0.0496**	**0.0131**	**3.2000e-004**	**0.0134**		**50.5648**	**50.5648**	**1.5100e-003**		**50.6026**

3.5 Grading - 2020

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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000		6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**8.6733**	**2.1739**	**10.8472**	**3.5965**	**2.0000**	**5.5965**		**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

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	0.9443	33.3270	7.5669	0.0935	2.4824	0.1063	2.5887	0.6690	0.1017	0.7708		10,230.2491	10,230.2491	0.9011		10,252.7777
Vendor	0.0150	0.4510	0.1149	1.1000e-003	0.0271	2.2100e-003	0.0293	7.8000e-003	2.1100e-003	9.9100e-003		117.6160	117.6160	8.6800e-003		117.8330
Worker	0.0734	0.0495	0.5669	1.6900e-003	0.1643	1.1500e-003	0.1655	0.0436	1.0600e-003	0.0446		168.5494	168.5494	5.0300e-003		168.6752
Total	**1.0326**	**33.8275**	**8.2487**	**0.0963**	**2.6738**	**0.1097**	**2.7835**	**0.7204**	**0.1049**	**0.8253**		**10,516.4146**	**10,516.4146**	**0.9149**		**10,539.2858**

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					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000	0.0000	6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**3.9030**	**2.1739**	**6.0769**	**1.6184**	**2.0000**	**3.6184**	**0.0000**	**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

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	0.9443	33.3270	7.5669	0.0935	2.4824	0.1063	2.5887	0.6690	0.1017	0.7708		10,230.2491	10,230.2491	0.9011		10,252.7777
Vendor	0.0150	0.4510	0.1149	1.1000e-003	0.0271	2.2100e-003	0.0293	7.8000e-003	2.1100e-003	9.9100e-003		117.6160	117.6160	8.6800e-003		117.8330
Worker	0.0734	0.0495	0.5669	1.6900e-003	0.1643	1.1500e-003	0.1655	0.0436	1.0600e-003	0.0446		168.5494	168.5494	5.0300e-003		168.6752
Total	**1.0326**	**33.8275**	**8.2487**	**0.0963**	**2.6738**	**0.1097**	**2.7835**	**0.7204**	**0.1049**	**0.8253**		**10,516.4146**	**10,516.4146**	**0.9149**		**10,539.2858**

3.5 Grading - 2021

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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

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	0.8868	30.6232	7.4918	0.0921	8.4055	0.0934	8.4989	2.1229	0.0894	2.2123		10,103.0605	10,103.0605	0.8925		10,125.3719
Vendor	0.0121	0.4073	0.1038	1.0800e-003	0.0271	8.6000e-004	0.0279	7.8000e-003	8.2000e-004	8.6100e-003		116.5408	116.5408	8.3300e-003		116.7490
Worker	0.0692	0.0449	0.5305	1.6300e-003	0.1643	1.1300e-003	0.1654	0.0436	1.0500e-003	0.0446		162.8882	162.8882	4.6500e-003		163.0044
Total	**0.9681**	**31.0755**	**8.1260**	**0.0948**	**8.5968**	**0.0954**	**8.6923**	**2.1742**	**0.0913**	**2.2655**		**10,382.4895**	**10,382.4895**	**0.9054**		**10,405.1252**

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					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**3.9030**	**1.9853**	**5.8883**	**1.6184**	**1.8265**	**3.4449**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

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	0.8868	30.6232	7.4918	0.0921	8.4055	0.0934	8.4989	2.1229	0.0894	2.2123		10,103.0605	10,103.0605	0.8925		10,125.3719
Vendor	0.0121	0.4073	0.1038	1.0800e-003	0.0271	8.6000e-004	0.0279	7.8000e-003	8.2000e-004	8.6100e-003		116.5408	116.5408	8.3300e-003		116.7490
Worker	0.0692	0.0449	0.5305	1.6300e-003	0.1643	1.1300e-003	0.1654	0.0436	1.0500e-003	0.0446		162.8882	162.8882	4.6500e-003		163.0044
Total	**0.9681**	**31.0755**	**8.1260**	**0.0948**	**8.5968**	**0.0954**	**8.6923**	**2.1742**	**0.0913**	**2.2655**		**10,382.4895**	**10,382.4895**	**0.9054**		**10,405.1252**

3.6 Pipeline Installation/Backfill - 2020

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	0.8535	7.9964	9.2531	0.0149		0.4462	0.4462		0.4262	0.4262		1,423.9215	1,423.9215	0.2941		1,431.2741
Total	**0.8535**	**7.9964**	**9.2531**	**0.0149**	**0.0000**	**0.4462**	**0.4462**	**0.0000**	**0.4262**	**0.4262**		**1,423.9215**	**1,423.9215**	**0.2941**		**1,431.2741**

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
Vendor	7.4700e-003	0.2255	0.0575	5.5000e-004	0.0135	1.1000e-003	0.0146	3.9000e-003	1.0600e-003	4.9500e-003		58.8080	58.8080	4.3400e-003		58.9165
Worker	0.0147	9.8900e-003	0.1134	3.4000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9300e-003		33.7099	33.7099	1.0100e-003		33.7351
Total	**0.0222**	**0.2354**	**0.1708**	**8.9000e-004**	**0.0464**	**1.3300e-003**	**0.0477**	**0.0126**	**1.2700e-003**	**0.0139**		**92.5179**	**92.5179**	**5.3500e-003**		**92.6515**

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	0.8535	7.9964	9.2531	0.0149		0.4462	0.4462		0.4262	0.4262	0.0000	1,423.9215	1,423.9215	0.2941		1,431.2741
Total	**0.8535**	**7.9964**	**9.2531**	**0.0149**	**0.0000**	**0.4462**	**0.4462**	**0.0000**	**0.4262**	**0.4262**	**0.0000**	**1,423.9215**	**1,423.9215**	**0.2941**		**1,431.2741**

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
Vendor	7.4700e-003	0.2255	0.0575	5.5000e-004	0.0135	1.1000e-003	0.0146	3.9000e-003	1.0600e-003	4.9500e-003		58.8080	58.8080	4.3400e-003		58.9165
Worker	0.0147	9.8900e-003	0.1134	3.4000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9300e-003		33.7099	33.7099	1.0100e-003		33.7351
Total	**0.0222**	**0.2354**	**0.1708**	**8.9000e-004**	**0.0464**	**1.3300e-003**	**0.0477**	**0.0126**	**1.2700e-003**	**0.0139**		**92.5179**	**92.5179**	**5.3500e-003**		**92.6515**

3.7 Pipeline Paving - 2020

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	0.8914	10.5480	6.2422	0.0133		0.4420	0.4420		0.4067	0.4067		1,291.3133	1,291.3133	0.4176		1,301.7542
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8914**	**10.5480**	**6.2422**	**0.0133**		**0.4420**	**0.4420**		**0.4067**	**0.4067**		**1,291.3133**	**1,291.3133**	**0.4176**		**1,301.7542**

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
Vendor	7.4700e-003	0.2255	0.0575	5.5000e-004	0.0135	1.1000e-003	0.0146	3.9000e-003	1.0600e-003	4.9500e-003		58.8080	58.8080	4.3400e-003		58.9165
Worker	0.0147	9.8900e-003	0.1134	3.4000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9300e-003		33.7099	33.7099	1.0100e-003		33.7351
Total	**0.0222**	**0.2354**	**0.1708**	**8.9000e-004**	**0.0464**	**1.3300e-003**	**0.0477**	**0.0126**	**1.2700e-003**	**0.0139**		**92.5179**	**92.5179**	**5.3500e-003**		**92.6515**

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	0.8914	10.5480	6.2422	0.0133		0.4420	0.4420		0.4067	0.4067	0.0000	1,291.3133	1,291.3133	0.4176		1,301.7542
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8914**	**10.5480**	**6.2422**	**0.0133**		**0.4420**	**0.4420**		**0.4067**	**0.4067**	**0.0000**	**1,291.3133**	**1,291.3133**	**0.4176**		**1,301.7542**

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
Vendor	7.4700e-003	0.2255	0.0575	5.5000e-004	0.0135	1.1000e-003	0.0146	3.9000e-003	1.0600e-003	4.9500e-003		58.8080	58.8080	4.3400e-003		58.9165
Worker	0.0147	9.8900e-003	0.1134	3.4000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9300e-003		33.7099	33.7099	1.0100e-003		33.7351
Total	**0.0222**	**0.2354**	**0.1708**	**8.9000e-004**	**0.0464**	**1.3300e-003**	**0.0477**	**0.0126**	**1.2700e-003**	**0.0139**		**92.5179**	**92.5179**	**5.3500e-003**		**92.6515**

3.7 Pipeline Paving - 2021

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	0.8345	9.7891	6.1890	0.0133		0.4012	0.4012		0.3691	0.3691		1,290.2287	1,290.2287	0.4173		1,300.6609
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8345**	**9.7891**	**6.1890**	**0.0133**		**0.4012**	**0.4012**		**0.3691**	**0.3691**		**1,290.2287**	**1,290.2287**	**0.4173**		**1,300.6609**

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
Vendor	6.0500e-003	0.2037	0.0519	5.4000e-004	0.0135	4.3000e-004	0.0140	3.9000e-003	4.1000e-004	4.3100e-003		58.2704	58.2704	4.1600e-003		58.3745
Worker	0.0138	8.9900e-003	0.1061	3.3000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9200e-003		32.5776	32.5776	9.3000e-004		32.6009
Total	**0.0199**	**0.2127**	**0.1580**	**8.7000e-004**	**0.0464**	**6.6000e-004**	**0.0471**	**0.0126**	**6.2000e-004**	**0.0132**		**90.8480**	**90.8480**	**5.0900e-003**		**90.9754**

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	0.8345	9.7891	6.1890	0.0133		0.4012	0.4012		0.3691	0.3691	0.0000	1,290.2287	1,290.2287	0.4173		1,300.6609
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8345**	**9.7891**	**6.1890**	**0.0133**		**0.4012**	**0.4012**		**0.3691**	**0.3691**	**0.0000**	**1,290.2287**	**1,290.2287**	**0.4173**		**1,300.6609**

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
Vendor	6.0500e-003	0.2037	0.0519	5.4000e-004	0.0135	4.3000e-004	0.0140	3.9000e-003	4.1000e-004	4.3100e-003		58.2704	58.2704	4.1600e-003		58.3745
Worker	0.0138	8.9900e-003	0.1061	3.3000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9200e-003		32.5776	32.5776	9.3000e-004		32.6009
Total	**0.0199**	**0.2127**	**0.1580**	**8.7000e-004**	**0.0464**	**6.6000e-004**	**0.0471**	**0.0126**	**6.2000e-004**	**0.0132**		**90.8480**	**90.8480**	**5.0900e-003**		**90.9754**

3.8 Building Construction - 2021

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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

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
Vendor	0.1512	5.0915	1.2975	0.0135	0.3385	0.0107	0.3492	0.0974	0.0102	0.1077		1,456.7597	1,456.7597	0.1041		1,459.3620
Worker	0.6019	0.3910	4.6152	0.0142	1.4294	9.8700e-003	1.4392	0.3791	9.1000e-003	0.3882		1,417.1271	1,417.1271	0.0404		1,418.1382
Total	**0.7530**	**5.4825**	**5.9127**	**0.0278**	**1.7679**	**0.0206**	**1.7884**	**0.4766**	**0.0193**	**0.4959**		**2,873.8869**	**2,873.8869**	**0.1445**		**2,877.5002**

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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

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
Vendor	0.1512	5.0915	1.2975	0.0135	0.3385	0.0107	0.3492	0.0974	0.0102	0.1077		1,456.7597	1,456.7597	0.1041		1,459.3620
Worker	0.6019	0.3910	4.6152	0.0142	1.4294	9.8700e-003	1.4392	0.3791	9.1000e-003	0.3882		1,417.1271	1,417.1271	0.0404		1,418.1382
Total	**0.7530**	**5.4825**	**5.9127**	**0.0278**	**1.7679**	**0.0206**	**1.7884**	**0.4766**	**0.0193**	**0.4959**		**2,873.8869**	**2,873.8869**	**0.1445**		**2,877.5002**

3.8 Building Construction - 2022

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	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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
Vendor	0.1406	4.8116	1.2289	0.0134	0.3385	9.2000e-003	0.3477	0.0974	8.8000e-003	0.1062		1,443.0689	1,443.0689	0.1009		1,445.5914
Worker	0.5690	0.3566	4.2915	0.0137	1.4294	9.6600e-003	1.4390	0.3791	8.9000e-003	0.3880		1,365.1340	1,365.1340	0.0371		1,366.0608
Total	**0.7096**	**5.1682**	**5.5204**	**0.0271**	**1.7679**	**0.0189**	**1.7867**	**0.4766**	**0.0177**	**0.4943**		**2,808.2028**	**2,808.2028**	**0.1380**		**2,811.6523**

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	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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
Vendor	0.1406	4.8116	1.2289	0.0134	0.3385	9.2000e-003	0.3477	0.0974	8.8000e-003	0.1062		1,443.0689	1,443.0689	0.1009		1,445.5914
Worker	0.5690	0.3566	4.2915	0.0137	1.4294	9.6600e-003	1.4390	0.3791	8.9000e-003	0.3880		1,365.1340	1,365.1340	0.0371		1,366.0608
Total	**0.7096**	**5.1682**	**5.5204**	**0.0271**	**1.7679**	**0.0189**	**1.7867**	**0.4766**	**0.0177**	**0.4943**		**2,808.2028**	**2,808.2028**	**0.1380**		**2,811.6523**

3.9 Architectural Coating - 2021

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	6.1857					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**6.4046**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

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
Vendor	0.0121	0.4073	0.1038	1.0800e-003	0.0271	8.6000e-004	0.0279	7.8000e-003	8.2000e-004	8.6100e-003		116.5408	116.5408	8.3300e-003		116.7490
Worker	0.1245	0.0809	0.9549	2.9400e-003	0.2957	2.0400e-003	0.2978	0.0784	1.8800e-003	0.0803		293.1987	293.1987	8.3700e-003		293.4079
Total	**0.1366**	**0.4882**	**1.0587**	**4.0200e-003**	**0.3228**	**2.9000e-003**	**0.3257**	**0.0862**	**2.7000e-003**	**0.0889**		**409.7395**	**409.7395**	**0.0167**		**410.1569**

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	6.1857					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**6.4046**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

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
Vendor	0.0121	0.4073	0.1038	1.0800e-003	0.0271	8.6000e-004	0.0279	7.8000e-003	8.2000e-004	8.6100e-003		116.5408	116.5408	8.3300e-003		116.7490
Worker	0.1245	0.0809	0.9549	2.9400e-003	0.2957	2.0400e-003	0.2978	0.0784	1.8800e-003	0.0803		293.1987	293.1987	8.3700e-003		293.4079
Total	**0.1366**	**0.4882**	**1.0587**	**4.0200e-003**	**0.3228**	**2.9000e-003**	**0.3257**	**0.0862**	**2.7000e-003**	**0.0889**		**409.7395**	**409.7395**	**0.0167**		**410.1569**

3.9 Architectural Coating - 2022

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	6.1857					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**6.3902**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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
Vendor	0.0113	0.3849	0.0983	1.0700e-003	0.0271	7.4000e-004	0.0278	7.8000e-003	7.0000e-004	8.5000e-003		115.4455	115.4455	8.0700e-003		115.6473
Worker	0.1177	0.0738	0.8879	2.8300e-003	0.2957	2.0000e-003	0.2977	0.0784	1.8400e-003	0.0803		282.4415	282.4415	7.6700e-003		282.6333
Total	**0.1290**	**0.4587**	**0.9862**	**3.9000e-003**	**0.3228**	**2.7400e-003**	**0.3255**	**0.0862**	**2.5400e-003**	**0.0888**		**397.8870**	**397.8870**	**0.0157**		**398.2806**

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	6.1857					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**6.3902**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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
Vendor	0.0113	0.3849	0.0983	1.0700e-003	0.0271	7.4000e-004	0.0278	7.8000e-003	7.0000e-004	8.5000e-003		115.4455	115.4455	8.0700e-003		115.6473
Worker	0.1177	0.0738	0.8879	2.8300e-003	0.2957	2.0000e-003	0.2977	0.0784	1.8400e-003	0.0803		282.4415	282.4415	7.6700e-003		282.6333
Total	**0.1290**	**0.4587**	**0.9862**	**3.9000e-003**	**0.3228**	**2.7400e-003**	**0.3255**	**0.0862**	**2.5400e-003**	**0.0888**		**397.8870**	**397.8870**	**0.0157**		**398.2806**

3.10 Paving - 2022

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	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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
Vendor	0.0113	0.3849	0.0983	1.0700e-003	0.0271	7.4000e-004	0.0278	7.8000e-003	7.0000e-004	8.5000e-003		115.4455	115.4455	8.0700e-003		115.6473
Worker	0.0523	0.0328	0.3946	1.2600e-003	0.1314	8.9000e-004	0.1323	0.0349	8.2000e-004	0.0357		125.5296	125.5296	3.4100e-003		125.6148
Total	**0.0636**	**0.4177**	**0.4929**	**2.3300e-003**	**0.1585**	**1.6300e-003**	**0.1601**	**0.0427**	**1.5200e-003**	**0.0442**		**240.9751**	**240.9751**	**0.0115**		**241.2621**

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	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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
Vendor	0.0113	0.3849	0.0983	1.0700e-003	0.0271	7.4000e-004	0.0278	7.8000e-003	7.0000e-004	8.5000e-003		115.4455	115.4455	8.0700e-003		115.6473
Worker	0.0523	0.0328	0.3946	1.2600e-003	0.1314	8.9000e-004	0.1323	0.0349	8.2000e-004	0.0357		125.5296	125.5296	3.4100e-003		125.6148
Total	**0.0636**	**0.4177**	**0.4929**	**2.3300e-003**	**0.1585**	**1.6300e-003**	**0.1601**	**0.0427**	**1.5200e-003**	**0.0442**		**240.9751**	**240.9751**	**0.0115**		**241.2621**

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	2.5221	9.2645	29.9847	0.1101	9.9218	0.0815	10.0033	2.6516	0.0759	2.7274		11,208.3184	11,208.3184	0.5426		11,221.8833
Unmitigated	2.5221	9.2645	29.9847	0.1101	9.9218	0.0815	10.0033	2.6516	0.0759	2.7274		11,208.3184	11,208.3184	0.5426		11,221.8833

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	132.00	179.08	179.08	412,436	412,436
Condo/Townhouse	648.00	659.34	659.34	1,846,630	1,846,630
Enclosed Parking with Elevator	0.00	0.00	0.00		
Hotel	520.00	682.50	682.50	1,606,142	1,606,142
Motel	60.00	81.40	81.40	187,471	187,471
Single Family Housing	48.00	48.00	48.00	136,107	136,107
Total	1,408.00	1,650.32	1,650.32	4,188,786	4,188,786

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-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	7.79	7.79	7.79	41.00	19.00	40.00	100	0	0
Condo/Townhouse	7.79	7.79	7.79	41.00	19.00	40.00	100	0	0
Enclosed Parking with Elevator	7.79	7.79	7.79	0.00	0.00	0.00	0	0	0
Hotel	7.79	7.79	7.79	19.40	61.60	19.00	100	0	0
Motel	7.79	7.79	7.79	19.00	62.00	19.00	100	0	0
Single Family Housing	7.79	7.79	7.79	41.00	19.00	40.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Condo/Townhouse	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Enclosed Parking with Elevator	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Hotel	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Motel	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Single Family Housing	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Kilowatt Hours of Renewable Electricity Generated

	ROG	NOx	CO	SO2	Fugitive 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	0.5242	4.5863	2.6909	0.0286		0.3622	0.3622		0.3622	0.3622		5,718.2384	5,718.2384	0.1096	0.1048	5,752.2190
NaturalGas Unmitigated	0.5242	4.5863	2.6909	0.0286		0.3622	0.3622		0.3622	0.3622		5,718.2384	5,718.2384	0.1096	0.1048	5,752.2190

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					
Apartments Low Rise	410.959	4.4300e-003	0.0379	0.0161	2.4000e-004		3.0600e-003	3.0600e-003		3.0600e-003	3.0600e-003		48.3482	48.3482	9.3000e-004	8.9000e-004	48.6355
Condo/Townhouse	19452.1	0.2098	1.7926	0.7628	0.0114		0.1449	0.1449		0.1449	0.1449		2,288.4770	2,288.4770	0.0439	0.0420	2,302.0763
Enclosed Parking with Elevator	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
Hotel	17974.8	0.1939	1.7622	1.4803	0.0106		0.1339	0.1339		0.1339	0.1339		2,114.6844	2,114.6844	0.0405	0.0388	2,127.2509
Motel	219.25	2.3600e-003	0.0215	0.0181	1.3000e-004		1.6300e-003	1.6300e-003		1.6300e-003	1.6300e-003		25.7941	25.7941	4.9000e-004	4.7000e-004	25.9474
Single Family Housing	10547.9	0.1138	0.9721	0.4136	6.2000e-003		0.0786	0.0786		0.0786	0.0786		1,240.9347	1,240.9347	0.0238	0.0228	1,248.3090
Total		**0.5242**	**4.5863**	**2.6909**	**0.0286**		**0.3622**	**0.3622**		**0.3622**	**0.3622**		**5,718.2384**	**5,718.2384**	**0.1096**	**0.1048**	**5,752.2190**

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					
Apartments Low Rise	0.410959	4.4300e-003	0.0379	0.0161	2.4000e-004		3.0600e-003	3.0600e-003		3.0600e-003	3.0600e-003		48.3482	48.3482	9.3000e-004	8.9000e-004	48.6355
Condo/Townhouse	19.4521	0.2098	1.7926	0.7628	0.0114		0.1449	0.1449		0.1449	0.1449		2,288.4770	2,288.4770	0.0439	0.0420	2,302.0763
Enclosed Parking with Elevator	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
Hotel	17.9748	0.1939	1.7622	1.4803	0.0106		0.1339	0.1339		0.1339	0.1339		2,114.6844	2,114.6844	0.0405	0.0388	2,127.2509
Motel	0.21925	2.3600e-003	0.0215	0.0181	1.3000e-004		1.6300e-003	1.6300e-003		1.6300e-003	1.6300e-003		25.7941	25.7941	4.9000e-004	4.7000e-004	25.9474
Single Family Housing	10.5479	0.1138	0.9721	0.4136	6.2000e-003		0.0786	0.0786		0.0786	0.0786		1,240.9347	1,240.9347	0.0238	0.0228	1,248.3090
Total		**0.5242**	**4.5863**	**2.6909**	**0.0286**		**0.3622**	**0.3622**		**0.3622**	**0.3622**		**5,718.2384**	**5,718.2384**	**0.1096**	**0.1048**	**5,752.2190**

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	8.9225	3.0215	10.0891	0.0191		0.2850	0.2850		0.2850	0.2850	0.0000	3,742.9908	3,742.9908	0.0868	0.0683	3,765.5234
Unmitigated	8.9225	3.0215	10.0891	0.0191		0.2850	0.2850		0.2850	0.2850	0.0000	3,742.9908	3,742.9908	0.0868	0.0683	3,765.5234

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	0.6999					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.6133					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.3417	2.9195	1.2424	0.0186		0.2361	0.2361		0.2361	0.2361	0.0000	3,727.0588	3,727.0588	0.0714	0.0683	3,749.2069
Landscaping	0.2676	0.1019	8.8468	4.7000e-004		0.0489	0.0489		0.0489	0.0489		15.9319	15.9319	0.0154		16.3165
Total	**8.9225**	**3.0215**	**10.0891**	**0.0191**		**0.2850**	**0.2850**		**0.2850**	**0.2850**	**0.0000**	**3,742.9908**	**3,742.9908**	**0.0868**	**0.0683**	**3,765.5234**

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	0.6999					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.6133					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.3417	2.9195	1.2424	0.0186		0.2361	0.2361		0.2361	0.2361	0.0000	3,727.0588	3,727.0588	0.0714	0.0683	3,749.2069
Landscaping	0.2676	0.1019	8.8468	4.7000e-004		0.0489	0.0489		0.0489	0.0489		15.9319	15.9319	0.0154		16.3165
Total	**8.9225**	**3.0215**	**10.0891**	**0.0191**		**0.2850**	**0.2850**		**0.2850**	**0.2850**	**0.0000**	**3,742.9908**	**3,742.9908**	**0.0868**	**0.0683**	**3,765.5234**

CalEEMod Version: CalEEMod.2016.3.2

Date: 10/16/2019 9:52 AM

Marsol Project
San Diego County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	93.34	1000sqft	0.00	93,340.00	0
Hotel	65.00	Room	0.00	131,611.00	0
Motel	10.00	Room	0.00	6,834.00	0
Apartments Low Rise	22.00	Dwelling Unit	0.00	16,174.00	63
Condo/Townhouse	81.00	Dwelling Unit	14.86	171,599.00	232
Single Family Housing	4.00	Dwelling Unit	0.00	28,000.00	11

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2023
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	448.3	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 100% of remaining electricty purchased from CCA or equivalent program

Land Use - Applicant specific information. Total site acreage included in residential uses. User Defined Res = Affordable Housing and Motel = Market Rate Hotel.

Construction Phase - Architectural coating to occur concurrently with building and paving. Demolition concurrent with site preperation.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Default construction equipment.

Off-road Equipment - For pipeline work.

Off-road Equipment - For pipeline work.

Off-road Equipment - For pipeline work.

Off-road Equipment - Default construction equipment.

Off-road Equipment - Added 2 trenchers for pipeline work.

Trips and VMT - Rounded worker and vendor trips to reflect round trips.

Demolition - Demolition of 5,800 SF building.

Grading - 43,000 CY of soil exported.

Architectural Coating - Del Mar Sustainability Plan

Vehicle Trips - LLG 2019

Woodstoves - No woodstoves or wood burning fireplaces. 166 natural gas fireplaces for hotel and residential uses and 10 fire pits.

Area Coating - Del Mar Sustainability Plan

Energy Use - Glumac 2019

Water And Wastewater - Glumac 2019

Construction Off-road Equipment Mitigation -

Energy Mitigation - 1,017,000 kWh of renewables energy from installation of PVs.

Waste Mitigation - AB 341

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaCoating	Area_EF_Nonresidential_Interior	250	50
tblAreaCoating	Area_EF_Residential_Exterior	250	100
tblAreaCoating	Area_EF_Residential_Interior	250	50

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tblConstructionPhase	NumDays	300.00	440.00
tblConstructionPhase	NumDays	20.00	30.00
tblConstructionPhase	NumDays	30.00	45.00
tblConstructionPhase	NumDays	30.00	25.00
tblConstructionPhase	NumDays	20.00	25.00
tblConstructionPhase	NumDays	20.00	35.00
tblConstructionPhase	NumDays	10.00	30.00
tblConstructionPhase	NumDays	10.00	20.00
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tblEnergyUse	LightingElect	1,001.10	0.00
tblEnergyUse	LightingElect	1.75	0.00
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tblEnergyUse	LightingElect	4.50	0.00
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tblEnergyUse	NT24E	3,795.01	8,363.45
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tblEnergyUse	NT24E	3.67	4.39
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tblEnergyUse	NT24NG	4,180.00	25,474.44
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tblEnergyUse	NT24NG	11.10	2.23
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tblEnergyUse	T24E	4.78	3.45
tblEnergyUse	T24E	4.78	5.71

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tblEnergyUse	T24NG	10,202.85	62,179.88
tblEnergyUse	T24NG	47.27	40.37
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tblEnergyUse	T24NG	19,206.92	682,774.49
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tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
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tblFireplaces	NumberNoFireplace	8.10	0.00
tblFireplaces	NumberNoFireplace	0.40	0.00
tblFireplaces	NumberWood	7.70	0.00
tblFireplaces	NumberWood	28.35	0.00
tblFireplaces	NumberWood	1.40	0.00
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tblLandUse	LandUseSquareFeet	94,380.00	131,611.00
tblLandUse	LandUseSquareFeet	19,602.00	6,834.00
tblLandUse	LandUseSquareFeet	22,000.00	16,174.00
tblLandUse	LandUseSquareFeet	81,000.00	171,599.00
tblLandUse	LandUseSquareFeet	7,200.00	28,000.00
tblLandUse	LotAcreage	2.14	0.00
tblLandUse	LotAcreage	2.17	0.00
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tblLandUse	LotAcreage	1.38	0.00
tblLandUse	LotAcreage	5.06	14.86

tblLandUse	LotAcreage	1.30	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblProjectCharacteristics	CO2IntensityFactor	720.49	448.3
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tblTripsAndVMT	VendorTripNumber	0.00	4.00
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tblVehicleTrips	CW_TL	9.50	7.79
tblVehicleTrips	CW_TL	9.50	7.79
tblVehicleTrips	CW_TL	9.50	7.79
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tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	DV_TP	38.00	0.00
tblVehicleTrips	DV_TP	38.00	0.00
tblVehicleTrips	DV_TP	11.00	0.00
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tblVehicleTrips	PR_TP	86.00	100.00
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tblVehicleTrips	SU_TR	4.84	8.14
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tblVehicleTrips	SU_TR	8.62	12.00
tblVehicleTrips	WD_TR	6.59	6.00
tblVehicleTrips	WD_TR	5.81	8.00
tblVehicleTrips	WD_TR	8.17	8.00
tblVehicleTrips	WD_TR	5.63	6.00
tblVehicleTrips	WD_TR	9.52	12.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	1,433,388.56	0.00
tblWater	IndoorWaterUseRate	5,277,476.08	0.00
tblWater	IndoorWaterUseRate	1,648,840.05	14,195,111.73

tblWater	IndoorWaterUseRate	253,667.70	0.00
tblWater	IndoorWaterUseRate	260,616.10	0.00
tblWater	OutdoorWaterUseRate	903,658.01	0.00
tblWater	OutdoorWaterUseRate	3,327,104.48	0.00
tblWater	OutdoorWaterUseRate	183,204.45	1,850,288.27
tblWater	OutdoorWaterUseRate	28,185.30	0.00
tblWater	OutdoorWaterUseRate	164,301.46	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	1.10	0.00
tblWoodstoves	NumberCatalytic	4.05	0.00
tblWoodstoves	NumberCatalytic	0.20	0.00
tblWoodstoves	NumberNoncatalytic	1.10	0.00
tblWoodstoves	NumberNoncatalytic	4.05	0.00
tblWoodstoves	NumberNoncatalytic	0.20	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

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					
2020	7.9957	106.6838	60.3706	0.1932	18.6298	3.8611	22.6894	10.0590	3.5682	13.8256	0.0000	19,866.6572	19,866.6572	3.6502	0.0000	19,957.9134
2021	9.3013	87.7462	45.8026	0.1693	17.3166	2.4846	19.8012	5.7834	2.2894	8.0727	0.0000	17,579.5621	17,579.5621	3.3004	0.0000	17,662.0721
2022	9.0372	22.6860	24.5127	0.0595	2.0907	0.9127	3.0034	0.5628	0.8635	1.4263	0.0000	5,900.4395	5,900.4395	0.7881	0.0000	5,920.1416
Maximum	**9.3013**	**106.6838**	**60.3706**	**0.1932**	**18.6298**	**3.8611**	**22.6894**	**10.0590**	**3.5682**	**13.8256**	**0.0000**	**19,866.6572**	**19,866.6572**	**3.6502**	**0.0000**	**19,957.9134**

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					
2020	7.9957	106.6838	60.3706	0.1932	8.5874	3.8611	12.6469	4.5810	3.5682	8.3477	0.0000	19,866.6572	19,866.6572	3.6502	0.0000	19,957.9134
2021	9.3013	87.7462	45.8026	0.1693	12.5462	2.4846	15.0308	3.8053	2.2894	6.0947	0.0000	17,579.5621	17,579.5621	3.3004	0.0000	17,662.0721
2022	9.0372	22.6860	24.5127	0.0595	2.0907	0.9127	3.0034	0.5628	0.8635	1.4263	0.0000	5,900.4395	5,900.4395	0.7881	0.0000	5,920.1416
Maximum	**9.3013**	**106.6838**	**60.3706**	**0.1932**	**12.5462**	**3.8611**	**15.0308**	**4.5810**	**3.5682**	**8.3477**	**0.0000**	**19,866.6572**	**19,866.6572**	**3.6502**	**0.0000**	**19,957.9134**

	ROG	NOx	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**	**38.94**	**0.00**	**32.56**	**45.45**	**0.00**	**31.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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	8.9225	3.0215	10.0891	0.0191		0.2850	0.2850		0.2850	0.2850	0.0000	3,742.9908	3,742.9908	0.0868	0.0683	3,765.5234
Energy	0.5242	4.5863	2.6909	0.0286		0.3622	0.3622		0.3622	0.3622		5,718.2384	5,718.2384	0.1096	0.1048	5,752.2190
Mobile	2.4408	9.5398	29.3145	0.1045	9.9218	0.0819	10.0037	2.6516	0.0763	2.7278		10,635.5549	10,635.5549	0.5437		10,649.1464
Total	**11.8875**	**17.1476**	**42.0945**	**0.1522**	**9.9218**	**0.7290**	**10.6509**	**2.6516**	**0.7234**	**3.3750**	**0.0000**	**20,096.7840**	**20,096.7840**	**0.7401**	**0.1732**	**20,166.8887**

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	8.9225	3.0215	10.0891	0.0191		0.2850	0.2850		0.2850	0.2850	0.0000	3,742.9908	3,742.9908	0.0868	0.0683	3,765.5234
Energy	0.5242	4.5863	2.6909	0.0286		0.3622	0.3622		0.3622	0.3622		5,718.2384	5,718.2384	0.1096	0.1048	5,752.2190
Mobile	2.4408	9.5398	29.3145	0.1045	9.9218	0.0819	10.0037	2.6516	0.0763	2.7278		10,635.5549	10,635.5549	0.5437		10,649.1464
Total	**11.8875**	**17.1476**	**42.0945**	**0.1522**	**9.9218**	**0.7290**	**10.6509**	**2.6516**	**0.7234**	**3.3750**	**0.0000**	**20,096.7840**	**20,096.7840**	**0.7401**	**0.1732**	**20,166.8887**

	ROG	NOx	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	Demolition	Demolition	10/1/2020	11/11/2020	5	30	
2	Site Preparation	Site Preparation	10/1/2020	11/11/2020	5	30	
3	Pipeline Site Preparation	Site Preparation	11/12/2020	12/9/2020	5	20	For Pipeline
4	Grading	Grading	11/12/2020	1/13/2021	5	45	
5	Pipeline Installation/Backfill	Grading	11/23/2020	12/25/2020	5	25	For Pipeline
6	Pipeline Paving	Paving	12/7/2020	1/8/2021	5	25	For Pipeline
7	Building Construction	Building Construction	1/14/2021	9/21/2022	5	440	
8	Architectural Coating	Architectural Coating	4/13/2021	11/10/2022	5	413	
9	Paving	Paving	9/22/2022	11/9/2022	5	35	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 0

Residential Indoor: 436,940; Residential Outdoor: 145,647; Non-Residential Indoor: 207,668; Non-Residential Outdoor: 69,223; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Pipeline Site Preparation	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Pipeline Installation/Backfill	Excavators	1	8.00	158	0.38
Pipeline Installation/Backfill	Generator Sets	1	8.00	84	0.74
Pipeline Installation/Backfill	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Pipeline Paving	Graders	1	8.00	187	0.41
Pipeline Paving	Paving Equipment	1	8.00	132	0.36
Pipeline Paving	Rollers	1	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	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
Demolition	6	16.00	0.00	26.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pipeline Site Preparation	1	6.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	4.00	5,376.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pipeline Installation/Backfill	3	4.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pipeline Paving	3	4.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	174.00	50.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	36.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	16.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2020

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					0.1927	0.0000	0.1927	0.0292	0.0000	0.0292			0.0000			0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.1927**	**1.6587**	**1.8514**	**0.0292**	**1.5419**	**1.5710**		**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

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	7.0400e-003	0.2441	0.0585	6.7000e-004	0.0151	7.9000e-004	0.0159	4.1500e-003	7.5000e-004	4.9000e-003		72.9417	72.9417	6.7600e-003		73.1108
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
Worker	0.0665	0.0444	0.4276	1.2700e-003	0.1314	9.2000e-004	0.1324	0.0349	8.5000e-004	0.0357		126.5811	126.5811	3.8100e-003		126.6764
Total	**0.0735**	**0.2885**	**0.4861**	**1.9400e-003**	**0.1466**	**1.7100e-003**	**0.1483**	**0.0390**	**1.6000e-003**	**0.0406**		**199.5229**	**199.5229**	**0.0106**		**199.7872**

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					0.0867	0.0000	0.0867	0.0131	0.0000	0.0131			0.0000			0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0867**	**1.6587**	**1.7454**	**0.0131**	**1.5419**	**1.5550**	**0.0000**	**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

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	7.0400e-003	0.2441	0.0585	6.7000e-004	0.0151	7.9000e-004	0.0159	4.1500e-003	7.5000e-004	4.9000e-003		72.9417	72.9417	6.7600e-003		73.1108
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
Worker	0.0665	0.0444	0.4276	1.2700e-003	0.1314	9.2000e-004	0.1324	0.0349	8.5000e-004	0.0357		126.5811	126.5811	3.8100e-003		126.6764
Total	**0.0735**	**0.2885**	**0.4861**	**1.9400e-003**	**0.1466**	**1.7100e-003**	**0.1483**	**0.0390**	**1.6000e-003**	**0.0406**		**199.5229**	**199.5229**	**0.0106**		**199.7872**

3.3 Site Preparation - 2020

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

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
Vendor	0.0157	0.4507	0.1275	1.0700e-003	0.0271	2.2500e-003	0.0293	7.8000e-003	2.1500e-003	9.9500e-003		114.5849	114.5849	9.2200e-003		114.8154
Worker	0.0748	0.0500	0.4810	1.4300e-003	0.1479	1.0400e-003	0.1489	0.0392	9.6000e-004	0.0402		142.4038	142.4038	4.2900e-003		142.5109
Total	**0.0905**	**0.5006**	**0.6086**	**2.5000e-003**	**0.1750**	**3.2900e-003**	**0.1782**	**0.0470**	**3.1100e-003**	**0.0501**		**256.9886**	**256.9886**	**0.0135**		**257.3263**

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					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**8.1298**	**2.1974**	**10.3272**	**4.4688**	**2.0216**	**6.4904**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

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
Vendor	0.0157	0.4507	0.1275	1.0700e-003	0.0271	2.2500e-003	0.0293	7.8000e-003	2.1500e-003	9.9500e-003		114.5849	114.5849	9.2200e-003		114.8154
Worker	0.0748	0.0500	0.4810	1.4300e-003	0.1479	1.0400e-003	0.1489	0.0392	9.6000e-004	0.0402		142.4038	142.4038	4.2900e-003		142.5109
Total	**0.0905**	**0.5006**	**0.6086**	**2.5000e-003**	**0.1750**	**3.2900e-003**	**0.1782**	**0.0470**	**3.1100e-003**	**0.0501**		**256.9886**	**256.9886**	**0.0135**		**257.3263**

3.4 Pipeline Site Preparation - 2020

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	0.4182	3.2986	3.6866	6.2600e-003		0.1982	0.1982		0.1982	0.1982		592.6646	592.6646	0.0375		593.6032
Total	**0.4182**	**3.2986**	**3.6866**	**6.2600e-003**	**0.0000**	**0.1982**	**0.1982**	**0.0000**	**0.1982**	**0.1982**		**592.6646**	**592.6646**	**0.0375**		**593.6032**

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
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
Worker	0.0249	0.0167	0.1604	4.8000e-004	0.0493	3.5000e-004	0.0496	0.0131	3.2000e-004	0.0134		47.4679	47.4679	1.4300e-003		47.5037
Total	**0.0249**	**0.0167**	**0.1604**	**4.8000e-004**	**0.0493**	**3.5000e-004**	**0.0496**	**0.0131**	**3.2000e-004**	**0.0134**		**47.4679**	**47.4679**	**1.4300e-003**		**47.5037**

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	0.4182	3.2986	3.6866	6.2600e-003		0.1982	0.1982		0.1982	0.1982	0.0000	592.6646	592.6646	0.0375		593.6032
Total	**0.4182**	**3.2986**	**3.6866**	**6.2600e-003**	**0.0000**	**0.1982**	**0.1982**	**0.0000**	**0.1982**	**0.1982**	**0.0000**	**592.6646**	**592.6646**	**0.0375**		**593.6032**

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
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
Worker	0.0249	0.0167	0.1604	4.8000e-004	0.0493	3.5000e-004	0.0496	0.0131	3.2000e-004	0.0134		47.4679	47.4679	1.4300e-003		47.5037
Total	**0.0249**	**0.0167**	**0.1604**	**4.8000e-004**	**0.0493**	**3.5000e-004**	**0.0496**	**0.0131**	**3.2000e-004**	**0.0134**		**47.4679**	**47.4679**	**1.4300e-003**		**47.5037**

3.5 Grading - 2020

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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000		6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**8.6733**	**2.1739**	**10.8472**	**3.5965**	**2.0000**	**5.5965**		**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

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	0.9705	33.6475	8.0668	0.0919	2.4824	0.1085	2.5909	0.6690	0.1039	0.7729		10,054.7379	10,054.7379	0.9320		10,078.0379
Vendor	0.0157	0.4507	0.1275	1.0700e-003	0.0271	2.2500e-003	0.0293	7.8000e-003	2.1500e-003	9.9500e-003		114.5849	114.5849	9.2200e-003		114.8154
Worker	0.0831	0.0555	0.5345	1.5900e-003	0.1643	1.1500e-003	0.1655	0.0436	1.0600e-003	0.0446		158.2264	158.2264	4.7600e-003		158.3455
Total	**1.0692**	**34.1537**	**8.7288**	**0.0946**	**2.6738**	**0.1119**	**2.7857**	**0.7204**	**0.1071**	**0.8275**		**10,327.5492**	**10,327.5492**	**0.9460**		**10,351.1988**

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					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000	0.0000	6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**3.9030**	**2.1739**	**6.0769**	**1.6184**	**2.0000**	**3.6184**	**0.0000**	**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

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	0.9705	33.6475	8.0668	0.0919	2.4824	0.1085	2.5909	0.6690	0.1039	0.7729		10,054.7379	10,054.7379	0.9320		10,078.0379
Vendor	0.0157	0.4507	0.1275	1.0700e-003	0.0271	2.2500e-003	0.0293	7.8000e-003	2.1500e-003	9.9500e-003		114.5849	114.5849	9.2200e-003		114.8154
Worker	0.0831	0.0555	0.5345	1.5900e-003	0.1643	1.1500e-003	0.1655	0.0436	1.0600e-003	0.0446		158.2264	158.2264	4.7600e-003		158.3455
Total	**1.0692**	**34.1537**	**8.7288**	**0.0946**	**2.6738**	**0.1119**	**2.7857**	**0.7204**	**0.1071**	**0.8275**		**10,327.5492**	**10,327.5492**	**0.9460**		**10,351.1988**

3.5 Grading - 2021

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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

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	0.9113	30.8874	7.9634	0.0905	8.4055	0.0954	8.5009	2.1229	0.0913	2.2142		9,928.5070	9,928.5070	0.9218		9,951.5514
Vendor	0.0128	0.4062	0.1156	1.0600e-003	0.0271	8.9000e-004	0.0280	7.8000e-003	8.5000e-004	8.6500e-003		113.5277	113.5277	8.8400e-003		113.7488
Worker	0.0785	0.0505	0.4987	1.5300e-003	0.1643	1.1300e-003	0.1654	0.0436	1.0500e-003	0.0446		152.9095	152.9095	4.3900e-003		153.0193
Total	**1.0025**	**31.3441**	**8.5776**	**0.0931**	**8.5968**	**0.0974**	**8.6943**	**2.1742**	**0.0932**	**2.2674**		**10,194.9442**	**10,194.9442**	**0.9350**		**10,218.3196**

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					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**3.9030**	**1.9853**	**5.8883**	**1.6184**	**1.8265**	**3.4449**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

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	0.9113	30.8874	7.9634	0.0905	8.4055	0.0954	8.5009	2.1229	0.0913	2.2142		9,928.5070	9,928.5070	0.9218		9,951.5514
Vendor	0.0128	0.4062	0.1156	1.0600e-003	0.0271	8.9000e-004	0.0280	7.8000e-003	8.5000e-004	8.6500e-003		113.5277	113.5277	8.8400e-003		113.7488
Worker	0.0785	0.0505	0.4987	1.5300e-003	0.1643	1.1300e-003	0.1654	0.0436	1.0500e-003	0.0446		152.9095	152.9095	4.3900e-003		153.0193
Total	**1.0025**	**31.3441**	**8.5776**	**0.0931**	**8.5968**	**0.0974**	**8.6943**	**2.1742**	**0.0932**	**2.2674**		**10,194.9442**	**10,194.9442**	**0.9350**		**10,218.3196**

3.6 Pipeline Installation/Backfill - 2020

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	0.8535	7.9964	9.2531	0.0149		0.4462	0.4462		0.4262	0.4262		1,423.9215	1,423.9215	0.2941		1,431.2741
Total	**0.8535**	**7.9964**	**9.2531**	**0.0149**	**0.0000**	**0.4462**	**0.4462**	**0.0000**	**0.4262**	**0.4262**		**1,423.9215**	**1,423.9215**	**0.2941**		**1,431.2741**

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
Vendor	7.8300e-003	0.2253	0.0638	5.3000e-004	0.0135	1.1200e-003	0.0147	3.9000e-003	1.0800e-003	4.9700e-003		57.2924	57.2924	4.6100e-003		57.4077
Worker	0.0166	0.0111	0.1069	3.2000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9300e-003		31.6453	31.6453	9.5000e-004		31.6691
Total	**0.0245**	**0.2364**	**0.1707**	**8.5000e-004**	**0.0464**	**1.3500e-003**	**0.0478**	**0.0126**	**1.2900e-003**	**0.0139**		**88.9377**	**88.9377**	**5.5600e-003**		**89.0768**

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	0.8535	7.9964	9.2531	0.0149		0.4462	0.4462		0.4262	0.4262	0.0000	1,423.9215	1,423.9215	0.2941		1,431.2741
Total	**0.8535**	**7.9964**	**9.2531**	**0.0149**	**0.0000**	**0.4462**	**0.4462**	**0.0000**	**0.4262**	**0.4262**	**0.0000**	**1,423.9215**	**1,423.9215**	**0.2941**		**1,431.2741**

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
Vendor	7.8300e-003	0.2253	0.0638	5.3000e-004	0.0135	1.1200e-003	0.0147	3.9000e-003	1.0800e-003	4.9700e-003		57.2924	57.2924	4.6100e-003		57.4077
Worker	0.0166	0.0111	0.1069	3.2000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9300e-003		31.6453	31.6453	9.5000e-004		31.6691
Total	**0.0245**	**0.2364**	**0.1707**	**8.5000e-004**	**0.0464**	**1.3500e-003**	**0.0478**	**0.0126**	**1.2900e-003**	**0.0139**		**88.9377**	**88.9377**	**5.5600e-003**		**89.0768**

3.7 Pipeline Paving - 2020

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	0.8914	10.5480	6.2422	0.0133		0.4420	0.4420		0.4067	0.4067		1,291.3133	1,291.3133	0.4176		1,301.7542
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8914**	**10.5480**	**6.2422**	**0.0133**		**0.4420**	**0.4420**		**0.4067**	**0.4067**		**1,291.3133**	**1,291.3133**	**0.4176**		**1,301.7542**

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
Vendor	7.8300e-003	0.2253	0.0638	5.3000e-004	0.0135	1.1200e-003	0.0147	3.9000e-003	1.0800e-003	4.9700e-003		57.2924	57.2924	4.6100e-003		57.4077
Worker	0.0166	0.0111	0.1069	3.2000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9300e-003		31.6453	31.6453	9.5000e-004		31.6691
Total	**0.0245**	**0.2364**	**0.1707**	**8.5000e-004**	**0.0464**	**1.3500e-003**	**0.0478**	**0.0126**	**1.2900e-003**	**0.0139**		**88.9377**	**88.9377**	**5.5600e-003**		**89.0768**

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	0.8914	10.5480	6.2422	0.0133		0.4420	0.4420		0.4067	0.4067	0.0000	1,291.3133	1,291.3133	0.4176		1,301.7542
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8914**	**10.5480**	**6.2422**	**0.0133**		**0.4420**	**0.4420**		**0.4067**	**0.4067**	**0.0000**	**1,291.3133**	**1,291.3133**	**0.4176**		**1,301.7542**

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
Vendor	7.8300e-003	0.2253	0.0638	5.3000e-004	0.0135	1.1200e-003	0.0147	3.9000e-003	1.0800e-003	4.9700e-003		57.2924	57.2924	4.6100e-003		57.4077
Worker	0.0166	0.0111	0.1069	3.2000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9300e-003		31.6453	31.6453	9.5000e-004		31.6691
Total	**0.0245**	**0.2364**	**0.1707**	**8.5000e-004**	**0.0464**	**1.3500e-003**	**0.0478**	**0.0126**	**1.2900e-003**	**0.0139**		**88.9377**	**88.9377**	**5.5600e-003**		**89.0768**

3.7 Pipeline Paving - 2021

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	0.8345	9.7891	6.1890	0.0133		0.4012	0.4012		0.3691	0.3691		1,290.2287	1,290.2287	0.4173		1,300.6609
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8345**	**9.7891**	**6.1890**	**0.0133**		**0.4012**	**0.4012**		**0.3691**	**0.3691**		**1,290.2287**	**1,290.2287**	**0.4173**		**1,300.6609**

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
Vendor	6.3700e-003	0.2031	0.0578	5.3000e-004	0.0135	4.5000e-004	0.0140	3.9000e-003	4.3000e-004	4.3200e-003		56.7639	56.7639	4.4200e-003		56.8744
Worker	0.0157	0.0101	0.0997	3.1000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9200e-003		30.5819	30.5819	8.8000e-004		30.6039
Total	**0.0221**	**0.2132**	**0.1575**	**8.4000e-004**	**0.0464**	**6.8000e-004**	**0.0471**	**0.0126**	**6.4000e-004**	**0.0132**		**87.3458**	**87.3458**	**5.3000e-003**		**87.4783**

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	0.8345	9.7891	6.1890	0.0133		0.4012	0.4012		0.3691	0.3691	0.0000	1,290.2287	1,290.2287	0.4173		1,300.6609
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8345**	**9.7891**	**6.1890**	**0.0133**		**0.4012**	**0.4012**		**0.3691**	**0.3691**	**0.0000**	**1,290.2287**	**1,290.2287**	**0.4173**		**1,300.6609**

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
Vendor	6.3700e-003	0.2031	0.0578	5.3000e-004	0.0135	4.5000e-004	0.0140	3.9000e-003	4.3000e-004	4.3200e-003		56.7639	56.7639	4.4200e-003		56.8744
Worker	0.0157	0.0101	0.0997	3.1000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.1000e-004	8.9200e-003		30.5819	30.5819	8.8000e-004		30.6039
Total	**0.0221**	**0.2132**	**0.1575**	**8.4000e-004**	**0.0464**	**6.8000e-004**	**0.0471**	**0.0126**	**6.4000e-004**	**0.0132**		**87.3458**	**87.3458**	**5.3000e-003**		**87.4783**

3.8 Building Construction - 2021

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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

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
Vendor	0.1594	5.0779	1.4447	0.0132	0.3385	0.0111	0.3496	0.0974	0.0106	0.1081		1,419.0965	1,419.0965	0.1106		1,421.8603
Worker	0.6825	0.4389	4.3383	0.0134	1.4294	9.8700e-003	1.4392	0.3791	9.1000e-003	0.3882		1,330.3128	1,330.3128	0.0382		1,331.2683
Total	**0.8419**	**5.5168**	**5.7830**	**0.0266**	**1.7679**	**0.0210**	**1.7889**	**0.4766**	**0.0197**	**0.4963**		**2,749.4093**	**2,749.4093**	**0.1488**		**2,753.1286**

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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

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
Vendor	0.1594	5.0779	1.4447	0.0132	0.3385	0.0111	0.3496	0.0974	0.0106	0.1081		1,419.0965	1,419.0965	0.1106		1,421.8603
Worker	0.6825	0.4389	4.3383	0.0134	1.4294	9.8700e-003	1.4392	0.3791	9.1000e-003	0.3882		1,330.3128	1,330.3128	0.0382		1,331.2683
Total	**0.8419**	**5.5168**	**5.7830**	**0.0266**	**1.7679**	**0.0210**	**1.7889**	**0.4766**	**0.0197**	**0.4963**		**2,749.4093**	**2,749.4093**	**0.1488**		**2,753.1286**

3.8 Building Construction - 2022

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	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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
Vendor	0.1483	4.7954	1.3679	0.0131	0.3385	9.5900e-003	0.3481	0.0974	9.1700e-003	0.1066		1,405.5131	1,405.5131	0.1070		1,408.1886
Worker	0.6468	0.4001	4.0255	0.0129	1.4294	9.6600e-003	1.4390	0.3791	8.9000e-003	0.3880		1,281.5545	1,281.5545	0.0350		1,282.4293
Total	**0.7950**	**5.1955**	**5.3934**	**0.0259**	**1.7679**	**0.0193**	**1.7871**	**0.4766**	**0.0181**	**0.4946**		**2,687.0676**	**2,687.0676**	**0.1420**		**2,690.6179**

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	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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
Vendor	0.1483	4.7954	1.3679	0.0131	0.3385	9.5900e-003	0.3481	0.0974	9.1700e-003	0.1066		1,405.5131	1,405.5131	0.1070		1,408.1886
Worker	0.6468	0.4001	4.0255	0.0129	1.4294	9.6600e-003	1.4390	0.3791	8.9000e-003	0.3880		1,281.5545	1,281.5545	0.0350		1,282.4293
Total	**0.7950**	**5.1955**	**5.3934**	**0.0259**	**1.7679**	**0.0193**	**1.7871**	**0.4766**	**0.0181**	**0.4946**		**2,687.0676**	**2,687.0676**	**0.1420**		**2,690.6179**

3.9 Architectural Coating - 2021

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	6.1857					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**6.4046**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

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
Vendor	0.0128	0.4062	0.1156	1.0600e-003	0.0271	8.9000e-004	0.0280	7.8000e-003	8.5000e-004	8.6500e-003		113.5277	113.5277	8.8400e-003		113.7488
Worker	0.1412	0.0908	0.8976	2.7600e-003	0.2957	2.0400e-003	0.2978	0.0784	1.8800e-003	0.0803		275.2371	275.2371	7.9100e-003		275.4348
Total	**0.1540**	**0.4970**	**1.0132**	**3.8200e-003**	**0.3228**	**2.9300e-003**	**0.3257**	**0.0862**	**2.7300e-003**	**0.0890**		**388.7649**	**388.7649**	**0.0168**		**389.1836**

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	6.1857					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**6.4046**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

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
Vendor	0.0128	0.4062	0.1156	1.0600e-003	0.0271	8.9000e-004	0.0280	7.8000e-003	8.5000e-004	8.6500e-003		113.5277	113.5277	8.8400e-003		113.7488
Worker	0.1412	0.0908	0.8976	2.7600e-003	0.2957	2.0400e-003	0.2978	0.0784	1.8800e-003	0.0803		275.2371	275.2371	7.9100e-003		275.4348
Total	**0.1540**	**0.4970**	**1.0132**	**3.8200e-003**	**0.3228**	**2.9300e-003**	**0.3257**	**0.0862**	**2.7300e-003**	**0.0890**		**388.7649**	**388.7649**	**0.0168**		**389.1836**

3.9 Architectural Coating - 2022

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	6.1857					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**6.3902**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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
Vendor	0.0119	0.3836	0.1094	1.0400e-003	0.0271	7.7000e-004	0.0279	7.8000e-003	7.3000e-004	8.5300e-003		112.4411	112.4411	8.5600e-003		112.6551
Worker	0.1338	0.0828	0.8329	2.6600e-003	0.2957	2.0000e-003	0.2977	0.0784	1.8400e-003	0.0803		265.1492	265.1492	7.2400e-003		265.3302
Total	**0.1457**	**0.4664**	**0.9423**	**3.7000e-003**	**0.3228**	**2.7700e-003**	**0.3256**	**0.0862**	**2.5700e-003**	**0.0888**		**377.5903**	**377.5903**	**0.0158**		**377.9853**

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	6.1857					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**6.3902**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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
Vendor	0.0119	0.3836	0.1094	1.0400e-003	0.0271	7.7000e-004	0.0279	7.8000e-003	7.3000e-004	8.5300e-003		112.4411	112.4411	8.5600e-003		112.6551
Worker	0.1338	0.0828	0.8329	2.6600e-003	0.2957	2.0000e-003	0.2977	0.0784	1.8400e-003	0.0803		265.1492	265.1492	7.2400e-003		265.3302
Total	**0.1457**	**0.4664**	**0.9423**	**3.7000e-003**	**0.3228**	**2.7700e-003**	**0.3256**	**0.0862**	**2.5700e-003**	**0.0888**		**377.5903**	**377.5903**	**0.0158**		**377.9853**

3.10 Paving - 2022

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	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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
Vendor	0.0119	0.3836	0.1094	1.0400e-003	0.0271	7.7000e-004	0.0279	7.8000e-003	7.3000e-004	8.5300e-003		112.4411	112.4411	8.5600e-003		112.6551
Worker	0.0595	0.0368	0.3702	1.1800e-003	0.1314	8.9000e-004	0.1323	0.0349	8.2000e-004	0.0357		117.8441	117.8441	3.2200e-003		117.9245
Total	**0.0713**	**0.4204**	**0.4796**	**2.2200e-003**	**0.1585**	**1.6600e-003**	**0.1602**	**0.0427**	**1.5500e-003**	**0.0442**		**230.2851**	**230.2851**	**0.0118**		**230.5796**

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	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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
Vendor	0.0119	0.3836	0.1094	1.0400e-003	0.0271	7.7000e-004	0.0279	7.8000e-003	7.3000e-004	8.5300e-003		112.4411	112.4411	8.5600e-003		112.6551
Worker	0.0595	0.0368	0.3702	1.1800e-003	0.1314	8.9000e-004	0.1323	0.0349	8.2000e-004	0.0357		117.8441	117.8441	3.2200e-003		117.9245
Total	**0.0713**	**0.4204**	**0.4796**	**2.2200e-003**	**0.1585**	**1.6600e-003**	**0.1602**	**0.0427**	**1.5500e-003**	**0.0442**		**230.2851**	**230.2851**	**0.0118**		**230.5796**

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	2.4408	9.5398	29.3145	0.1045	9.9218	0.0819	10.0037	2.6516	0.0763	2.7278		10,635.5549	10,635.5549	0.5437		10,649.1464
Unmitigated	2.4408	9.5398	29.3145	0.1045	9.9218	0.0819	10.0037	2.6516	0.0763	2.7278		10,635.5549	10,635.5549	0.5437		10,649.1464

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	132.00	179.08	179.08	412,436	412,436
Condo/Townhouse	648.00	659.34	659.34	1,846,630	1,846,630
Enclosed Parking with Elevator	0.00	0.00	0.00		
Hotel	520.00	682.50	682.50	1,606,142	1,606,142
Motel	60.00	81.40	81.40	187,471	187,471
Single Family Housing	48.00	48.00	48.00	136,107	136,107
Total	1,408.00	1,650.32	1,650.32	4,188,786	4,188,786

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-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	7.79	7.79	7.79	41.00	19.00	40.00	100	0	0
Condo/Townhouse	7.79	7.79	7.79	41.00	19.00	40.00	100	0	0
Enclosed Parking with Elevator	7.79	7.79	7.79	0.00	0.00	0.00	0	0	0
Hotel	7.79	7.79	7.79	19.40	61.60	19.00	100	0	0
Motel	7.79	7.79	7.79	19.00	62.00	19.00	100	0	0
Single Family Housing	7.79	7.79	7.79	41.00	19.00	40.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Condo/Townhouse	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Enclosed Parking with Elevator	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Hotel	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Motel	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Single Family Housing	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Kilowatt Hours of Renewable Electricity Generated

	ROG	NOx	CO	SO2	Fugitive 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	0.5242	4.5863	2.6909	0.0286		0.3622	0.3622		0.3622	0.3622		5,718.2384	5,718.2384	0.1096	0.1048	5,752.2190
NaturalGas Unmitigated	0.5242	4.5863	2.6909	0.0286		0.3622	0.3622		0.3622	0.3622		5,718.2384	5,718.2384	0.1096	0.1048	5,752.2190

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					
Apartments Low Rise	410.959	4.4300e-003	0.0379	0.0161	2.4000e-004		3.0600e-003	3.0600e-003		3.0600e-003	3.0600e-003		48.3482	48.3482	9.3000e-004	8.9000e-004	48.6355
Condo/Townhouse	19452.1	0.2098	1.7926	0.7628	0.0114		0.1449	0.1449		0.1449	0.1449		2,288.4770	2,288.4770	0.0439	0.0420	2,302.0763
Enclosed Parking with Elevator	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
Hotel	17974.8	0.1939	1.7622	1.4803	0.0106		0.1339	0.1339		0.1339	0.1339		2,114.6844	2,114.6844	0.0405	0.0388	2,127.2509
Motel	219.25	2.3600e-003	0.0215	0.0181	1.3000e-004		1.6300e-003	1.6300e-003		1.6300e-003	1.6300e-003		25.7941	25.7941	4.9000e-004	4.7000e-004	25.9474
Single Family Housing	10547.9	0.1138	0.9721	0.4136	6.2000e-003		0.0786	0.0786		0.0786	0.0786		1,240.9347	1,240.9347	0.0238	0.0228	1,248.3090
Total		**0.5242**	**4.5863**	**2.6909**	**0.0286**		**0.3622**	**0.3622**		**0.3622**	**0.3622**		**5,718.2384**	**5,718.2384**	**0.1096**	**0.1048**	**5,752.2190**

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					
Apartments Low Rise	0.410959	4.4300e-003	0.0379	0.0161	2.4000e-004		3.0600e-003	3.0600e-003		3.0600e-003	3.0600e-003		48.3482	48.3482	9.3000e-004	8.9000e-004	48.6355
Condo/Townhouse	19.4521	0.2098	1.7926	0.7628	0.0114		0.1449	0.1449		0.1449	0.1449		2,288.4770	2,288.4770	0.0439	0.0420	2,302.0763
Enclosed Parking with Elevator	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
Hotel	17.9748	0.1939	1.7622	1.4803	0.0106		0.1339	0.1339		0.1339	0.1339		2,114.6844	2,114.6844	0.0405	0.0388	2,127.2509
Motel	0.21925	2.3600e-003	0.0215	0.0181	1.3000e-004		1.6300e-003	1.6300e-003		1.6300e-003	1.6300e-003		25.7941	25.7941	4.9000e-004	4.7000e-004	25.9474
Single Family Housing	10.5479	0.1138	0.9721	0.4136	6.2000e-003		0.0786	0.0786		0.0786	0.0786		1,240.9347	1,240.9347	0.0238	0.0228	1,248.3090
Total		**0.5242**	**4.5863**	**2.6909**	**0.0286**		**0.3622**	**0.3622**		**0.3622**	**0.3622**		**5,718.2384**	**5,718.2384**	**0.1096**	**0.1048**	**5,752.2190**

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	8.9225	3.0215	10.0891	0.0191		0.2850	0.2850		0.2850	0.2850	0.0000	3,742.9908	3,742.9908	0.0868	0.0683	3,765.5234
Unmitigated	8.9225	3.0215	10.0891	0.0191		0.2850	0.2850		0.2850	0.2850	0.0000	3,742.9908	3,742.9908	0.0868	0.0683	3,765.5234

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	0.6999					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.6133					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.3417	2.9195	1.2424	0.0186		0.2361	0.2361		0.2361	0.2361	0.0000	3,727.0588	3,727.0588	0.0714	0.0683	3,749.2069
Landscaping	0.2676	0.1019	8.8468	4.7000e-004		0.0489	0.0489		0.0489	0.0489		15.9319	15.9319	0.0154		16.3165
Total	**8.9225**	**3.0215**	**10.0891**	**0.0191**		**0.2850**	**0.2850**		**0.2850**	**0.2850**	**0.0000**	**3,742.9908**	**3,742.9908**	**0.0868**	**0.0683**	**3,765.5234**

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	0.6999					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.6133					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.3417	2.9195	1.2424	0.0186		0.2361	0.2361		0.2361	0.2361	0.0000	3,727.0588	3,727.0588	0.0714	0.0683	3,749.2069
Landscaping	0.2676	0.1019	8.8468	4.7000e-004		0.0489	0.0489		0.0489	0.0489		15.9319	15.9319	0.0154		16.3165
Total	**8.9225**	**3.0215**	**10.0891**	**0.0191**		**0.2850**	**0.2850**		**0.2850**	**0.2850**	**0.0000**	**3,742.9908**	**3,742.9908**	**0.0868**	**0.0683**	**3,765.5234**

APPENDIX B

CO Hot Spot Analysis

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Hwy101_VDLV 2035
RUN: STANDARD RUN (WORST CASE ANGLE)
POLLUTANT: CO

I. SITE VARIABLES

U=	1.0 M/S	Z0=	100. CM	ALT=	18.3 (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	2.4 PPM		
SIGTH=	10. DEGREES	TEMP=	5.1 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Via de la Va	500	36	30	36	AG	250	2.6	0.0	33.0
B. Via de la Va	500	18	-30	18	AG	245	2.6	0.0	33.0
C. Via de la Va	500	-12	-18	-12	AG	620	2.6	0.0	33.0
D. Via de la Va	-30	18	-500	18	AG	328	2.6	0.0	33.0
E. Via de la Va	-500	-12	30	-12	AG	21	2.6	0.0	33.0
F. Via de la Va	-500	-54	-18	-54	AG	273	2.6	0.0	33.0
G. Via de la Va	0	-36	500	-36	AG	47	2.6	0.0	33.0
H. Via de la Va	12	-500	12	18	AG	793	2.6	0.0	33.0
I. Hwy 101 NBLA	30	-500	30	-12	AG	57	2.6	0.0	33.0
J. Hwy 101 NBT	42	-500	42	-36	AG	810	2.6	0.0	33.0
K. Hwy 101 NBRA	30	-12	30	500	AG	170	2.6	0.0	33.0
L. Hwy 101 NBD	0	500	0	-36	AG	1451	2.6	0.0	33.0
M. Hwy 101 SBLA	-18	500	-18	-12	AG	350	2.6	0.0	33.0
N. Hwy 101 SBTA	-30	500	-30	18	AG	620	2.6	0.0	33.0
O. Hwy 101 SBRA	-18	-12	-18	-500	AG	26	2.6	0.0	33.0
P. Hwy 101 SBD	-500	-36	0	-36	AG	917	2.6	0.0	33.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. SR1	-60	50	5.9
2. SR2	60	70	5.9
3. SR3	-50	-80	5.9
4. SR4	70	-70	5.9

JOB: Hwy101_VDLV 2035
RUN: STANDARD RUN (WORST CASE ANGLE)
POLLUTANT: CO

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SR1	135.	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2. SR2	220.	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3. SR3	11.	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4. SR4	315.	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P
1. SR1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
2. SR2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3. SR3	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1
4. SR4	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: JDB_VDLV
RUN: STANDARD RUN (WORST CASE ANGLE)
POLLUTANT: CO

I. SITE VARIABLES

U=	1.0 M/S	Z0=	100. CM	ALT=	4.6 (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	2.4 PPM		
SIGTH=	10. DEGREES	TEMP=	5.1 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Via de la Va	*	500	36	30	36	* AG	82	2.6	0.0	33.0
B. Via de la Va	*	500	18	-30	18	* AG	649	2.6	0.0	33.0
C. Via de la Va	*	500	-12	-18	-12	* AG	61	2.6	0.0	33.0
D. Via de la Va	*	-30	18	-500	18	* AG	1649	2.6	0.0	33.0
E. Via de la Va	*	-500	-12	30	-12	* AG	580	2.6	0.0	33.0
F. Via de la Va	*	-500	-54	-18	-54	* AG	791	2.6	0.0	33.0
G. Via de la Va	*	0	-36	500	-36	* AG	540	2.6	0.0	33.0
H. Via de la Va	*	12	-500	12	18	* AG	1134	2.6	0.0	33.0
I. Jimmy Durant	*	30	-500	30	-12	* AG	251	2.6	0.0	33.0
J. Jimmy Durant	*	42	-500	42	-36	* AG	300	2.6	0.0	33.0
K. Jimmy Durant	*	30	-12	30	500	* AG	480	2.6	0.0	33.0
L. Jimmy Durant	*	0	500	0	-36	* AG	922	2.6	0.0	33.0
M. Jimmy Durant	*	-18	500	-18	-12	* AG	520	2.6	0.0	33.0
N. Jimmy Durant	*	-30	500	-30	18	* AG	150	2.6	0.0	33.0
O. Jimmy Durant	*	-18	-12	-18	-500	* AG	92	2.6	0.0	33.0
P. Jimmy Durant	*	-500	-36	0	-36	* AG	791	2.6	0.0	33.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z
1. SR1	*	-60	50	5.9
2. SR2	*	60	70	5.9
3. SR3	*	-50	-80	5.9
4. SR4	*	70	-70	5.9

JOB: JDB_VDLV
RUN: STANDARD RUN (WORST CASE ANGLE)
POLLUTANT: CO

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SR1	139.	2.8	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
2. SR2	251.	2.8	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3. SR3	12.	2.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
4. SR4	284.	2.8	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P
1. SR1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
2. SR2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3. SR3	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1
4. SR4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Scedros_VDLV
RUN: STANDARD RUN (WORST CASE ANGLE)
POLLUTANT: CO

I. SITE VARIABLES

U=	1.0 M/S	Z0=	100. CM	ALT=	20.4 (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	2.4 PPM		
SIGTH=	10. DEGREES	TEMP=	5.1 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Via de la Va	*	500	36	30	36	* AG	1013	2.6	0.0	33.0
B. Via de la Va	*	500	18	-30	18	* AG	150	2.6	0.0	33.0
C. Via de la Va	*	500	-12	-18	-12	* AG	1085	2.6	0.0	33.0
D. Via de la Va	*	-30	18	-500	18	* AG	52	2.6	0.0	33.0
E. Via de la Va	*	-500	-12	30	-12	* AG	721	2.6	0.0	33.0
F. Via de la Va	*	0	-36	500	-36	* AG	881	2.6	0.0	33.0
G. S. Cedros NB	*	30	-12	30	500	* AG	202	2.6	0.0	33.0
H. S. Cedros SB	*	0	500	0	-36	* AG	160	2.6	0.0	33.0
I. S. Cedros SB	*	-30	500	-30	18	* AG	72	2.6	0.0	33.0
J. S. Cedros SB	*	-18	-12	-18	-500	* AG	0	2.6	0.0	33.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z
1. SR1	*	-60	50	5.9
2. SR2	*	60	70	5.9
3. SR3	*	-50	-80	5.9
4. SR4	*	70	-70	5.9

JOB: Scedros_VDLV
RUN: STANDARD RUN (WORST CASE ANGLE)
POLLUTANT: CO

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SR1	100.	2.7	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2. SR2	110.	2.7	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
3. SR3	72.	2.7	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0
4. SR4	69.	2.7	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0

RECEPTOR	CONC/LINK (PPM) I	J
1. SR1	0.0	0.0
2. SR2	0.0	0.0
3. SR3	0.0	0.0
4. SR4	0.0	0.0

APPENDIX C

Renewable Energy Generation Calculation

Marisol Project
Renewable Energy Generation Calculations

Table 1
Solar Photovoltaics

Land Use	Electricity Generation		Emission Factors			Emissions Reduced
			CO2	CH4	N20	CO2e
	kWh/year	MWh/yr	lb/MWh			MT/year
Hotel	270,000	270.00	448.3	0.029	0.0006	55.13
Villas	678,000	678.00	448.3	0.029	0.0006	138.44
Market Rate Hotel	69,000	69.00	448.3	0.029	0.0006	14.09
					Total	**207.65**

Marisol Project
Renewable Energy Generation Calculations

Table 2
Solar Hot Water - Greenhouse Gas Emissions

Land Use	Therms/ year	mmBTU/ year	Emission Factor			CO2e
			CO2 lb/MMBTU	CH4 lb/MMBTU	N2O lb/MMBTU	MT/year
Domestic Hot Water	16,000	1,600	117.65	0.00	0.00	86.05
Pool Heating	0	-	117.65	0.00	0.00	0.00
					Total	**86.05**

Table 3
Solar Hot Water - Criteria Air Pollutants

Land Use	Therms/ year	mmBTU/ day	ROG	NOx	CO	SO2	PM10	PM2.5
			lb/MMBTU	lb/MMBTU	lb/MMBTU	lb/MMBTU	lb/MMBTU	lb/MMBTU
		Emission Factor	*0.01*	*0.10*	*0.08*	*0.00*	*0.01*	*0.01*
Domestic Hot Water	16,000	4.38	0.05	0.43	0.36	0.00	0.03	0.03
Pool Heating	0	-	0.00	0.00	0.00	0.00	0.00	0.00
		Total	0.05	0.43	0.36	0.00	0.03	0.03

APPENDIX D

Efficiency Metric Calculations

Series 13 Forcasts and Interpolation

	2020	2035
Res Population	4,399	4,672
Employment	4,542	4,704
Total (Service Population)	*8,941*	*9,376*

Source: SANDAG 2013

Calculated Linear Population Growth

Year	Pop
2020	8,941
2021	8,970
2022	8,999
2023	9,028
2024	9,057
2025	9,086
2026	9,115
2027	9,144
2028	9,173
2029	9,202
2030	9,231
2031	9,260
2032	9,289
2033	9,318
2034	9,347
2035	9,376

Emissions Reduction Targets

Target Metric	Horizon Year	
	2020	2035
Reduction Percent (from baseline)	15%	50%
Emissions Goals (MT CO_2E)	47,477	27,928

Source: City of Del Mar 2016

Calculated Linear Emissions Targets

Year	MT CO_2E
2020	47,477
2021	46,174
2022	44,870
2023	43,567
2024	42,264
2025	40,961
2026	39,657
2027	38,354
2028	37,051
2029	35,748
2030	34,444
2031	33,141
2032	31,838
2033	30,535
2034	29,231
2035	27,928

Service Population Threshold by Operational Year

Year	Threshold
2020	5.31
2021	5.15
2022	4.99
2023	4.83
2024	4.67
2025	4.51
2026	4.35
2027	4.19
2028	4.04
2029	3.88
2030	3.73
2031	3.58
2032	3.43
2033	3.28
2034	3.13
2035	2.98

Appendix D
Efficiency Metric Calculations

Calculated Linear Emissions based on

Year	MT CO_2E
2020	47,477
2021	45,008
2022	42,668
2023	40,449
2024	38,346
2025	36,352
2026	34,461
2027	32,669
2028	30,971
2029	29,360
2030	27,833
2031	26,386
2032	25,014
2033	23,713
2034	22,480
2035	21,311

Service Population Threshold by

Year	Threshold
2020	5.31
2021	5.02
2022	4.74
2023	4.48
2024	4.23
2025	4.00
2026	3.78
2027	3.57
2028	3.38
2029	3.19
2030	3.02
2031	2.85
2032	2.69
2033	2.54
2034	2.41
2035	2.27

Appendix D

Biological Resources Technical Report

DRAFT

Biological Resources Technical Report for the Marisol Project

Prepared for:

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TABLE OF CONTENTS

Section **Page No.**

ACRONYMS AND ABBREVIATIONS III

1 INTRODUCTION AND PROJECT DESCRIPTION 1
1.1 Purpose and Scope 1
1.2 Project Description 1

2 LOCATION AND PHYSICAL AND REGULATORY SETTING 3
2.1 Project Location 3
2.2 Soils 3
2.3 Terrain 3
2.4 Regulatory Setting 3
2.4.1 Multiple Species Conservation Plan 3
2.4.2 California Coastal Commission and Local Coastal Program 3
2.4.3 Migratory Bird Treaty Act 4

3 METHODS 9
3.1 Literature Review 9
3.2 Field Reconnaissance 9
3.2.1 Vegetation Community and Land Cover Mapping 10
3.2.2 Jurisdictional Delineation 11
3.2.3 Flora 11
3.2.4 Fauna 11
3.2.5 Special-Status and/or Regulated Resources 12
3.2.6 Survey Limitations 12

4 RESULTS 13
4.1 Vegetation Communities, Land Covers, and Floral Diversity 13
4.1.1 Scrub 13
4.1.2 Non-Natural Land Covers 14
4.1.3 Non-Vegetated Areas 18
4.3 Flora 19
4.4 Wildlife 19
4.5 Special-Status Plants and Wildlife 19
4.5.1 Special-Status Plant Species 19
4.5.2 Special-Status Wildlife Species 27
4.6 Wildlife Corridors and Habitat Linkages 27

5 PROJECT IMPACTS AND SIGNIFICANCE DETERMINATIONS 29

TABLE OF CONTENTS (CONTINUED)

Section **Page No.**

The purpose of Section 5 is to 29
5.1 Definition of Impacts 30
5.2 Impacts to Vegetation Communities and Land Covers 30
5.2.1 Permanent Direct Impacts 30
5.2.2 Indirect Impacts 35
5.3 Impacts to Jurisdictional Waters 37
5.4 Impacts to Special-Status Plant Species 37
5.4.1 Permanent Direct Impacts 37
5.4.2 Indirect Impacts 38
5.5 Impacts to Special-Status Wildlife Species 39
5.5.1 Permanent Direct Impacts 39
5.5.2 Indirect Impacts 39
5.6 Impacts to Wildlife Corridors and Habitat Connectivity 41
5.6.1 Permanent Direct Impacts 41
5.6.2 Indirect Impacts 42
5.7 Impacts to Regional Resource Planning 42

6 EXISTING REGULATIONS AND ENVIRONMENTAL PROTECTION FEATURES 43
6.1 Compliance with Existing Regulations 43
6.1.1 City of Del Mar Municipal Code 43
6.1.2 Other Regulations 45
6.2 Environmental Protection Features 46
6.3 Level of Significance after Mitigation 48

7 REFERENCES 49

APPENDICES

A Plant Compendium
B Wildlife Compendium
C Special-Status Plants Not Expected to Occur
D Special-Status Wildlife Species Analysis of Potential to Occur in the Study Area

TABLE OF CONTENTS (CONTINUED)

Page No.

FIGURES

1 Regional Map 5
2 Vicinity Map 7
3 Biological Resources Map 15
4 Limits of Disturbance 33

TABLES

1 Schedule of Surveys 9
2 Vegetation Alliances or Land Covers within the Study Area 13
3 Special-Status Plant with Potential to Occur 21

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
ACOE	U.S. Army Corps of Engineers
BMP	Best Management Practice
BTR	Biological Resources Technical Report
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
City	City of Encinitas
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
EPF	environmental protection feature
ER	existing regulation
GIS	geographic information system
GPS	Global Positioning System
LCP	Local Coastal Program
MBTA	Migratory Bird Treaty Act
MSCP	Multiple Species Conservation Plan
RWQCB	Regional Water Quality Control Board
SWPPP	Storm Water Pollution Prevention Plan
USFWS	U.S. Fish and Wildlife Service

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1 INTRODUCTION AND PROJECT DESCRIPTION

1.1 Purpose and Scope

In accordance with the requirements of the California Environmental Quality Act (CEQA), the purpose of this biological resources technical report (BTR) for the Marisol Specific Plan (project or proposed project) is to (1) document the biological resources that are present in the study area; (2) analyze the potential direct and indirect impacts to special-status biological resources resulting from the proposed project; (3) describe the significance of the potential impacts; and (4) identify recommended environmental protection features (EPFs) for consideration by the City of Del Mar (City), the lead agency, as part of the CEQA process.

1.2 Project Description

The Plan Area includes approximately 17.45 acres of land, located at Border Avenue and west of Camino Del Mar, as well as a portion east of Camino Del Mar, in the northwestern corner of the City of Del Mar. The Plan Area is comprised of 16.55 acres of privately owned land, 0.78-acre of public right-of-way along Camino Del Mar, and a 0.12-acre City coastal viewing access parcel located at the northern extent of the Plan Area. The Specific Plan Area would be accessible from the intersection of South Sierra Avenue and Border Avenue on the northern side of the Plan Area

The project consists of a Specific Plan including five land use sub-designations: Visitor Serving Accommodations (VSA), Parkland/Passive Open Space (PPOS), Coastal Bluff Protection Area (CBPA) and Steep Slope Protection Area (SSPA). The VSA land use sub-designation allows for the development of approximately 65 hotel guest rooms, 31 villas (27 of which may be used as hotel guest rooms when not in use by owners, subject to provisions in the Specific Plan), 10 lower-cost shared visitor-serving accommodations, 22 affordable housing units, and associated amenities. Amenities include, but are not limited to, restaurants, bar/lounge, special event space, meeting space, swimming pools, a spa and fitness center and retail.

The PPOS land use sub-designation allows for public amenities such as trails, vista points, picnic areas, public access stairway and public restrooms, and passive recreational uses. Passive recreational uses are defined in the Specific plan as low intensity recreational activities that require little or no infrastructure and that are geared toward the viewing and appreciation of scenic and environmentally sensitive areas.

The CBPA and SSPA land use sub-designations serve as protection areas. The only disturbance allowed within the CBPA is the minimal amount necessary to install drainage control measures to protect a coastal bluff area from degradation and/or erosion. Shoreline protection devices are prohibited in this area. The only disturbance allowed within the SSPA is the minimal amount

necessary to provide a public access stairway, public restrooms, and related facilities for hotel and public visitor services at the toe of slope; to implement drainage control measures to protect the steep slope area from degradation and/or erosion; and to allow interpretive signage and pathway lighting.

Off-site improvements include a new water main for the project to extend into the City in order to find a suitable connection point. The existing water mains servicing the northernmost houses before the entrance to the lagoon are currently served by either an existing 4-inch or 6-inch water main, which would not have sufficient capacity to serve as the connection point for the new water main. There are two alternatives for the proposed development's potable water supplied by the City. Both alternatives consist of constructing a new 16-inch diameter pipeline. One alternative is to construct approximately 4,000 linear feet of new 16-inch water main in Via De La Valle from the intersection of Via De La Valle and Jimmy Durante Boulevard to Camino Del Mar within the City. This new 16-inch water line would connect to the existing 18-inch City water main at the north end of Jimmy Durante Boulevard just south of Via De La Valle. The second alternative is to construct approximately 5,000 linear feet of 16-inch pipe connected to an existing 20-inch City pipeline beginning on the west side of the intersection of Jimmy Durante Boulevard and San Dieguito Drive. This pipeline would extend northwest, following the Public Works Yard paved access road, then go along the dirt access road adjacent to the Public Works Yard up to the proposed crossing of the railroad right-of-way and drainage ditch. The work to cross the railroad right-of-way and drainage ditch would be done using a jack-and-bore construction method to avoid interruption of these resources. Then the pipeline would continue west via 27th or 28th Street to Camino Del Mar, then north to Via De La Valle. This alternative would replace existing pipelines south of Sandy Lane and construct new pipelines north of Sandy Lane to Via de la Valle. All pipeline construction and replacement would occur within paved roads, City and North County Transit District right-of-way, or the Public Works yard.

2 LOCATION AND PHYSICAL AND REGULATORY SETTING

2.1 Project Location

The study area is located in the City of Del Mar, in the County of San Diego, California (Figure 1). The study area consists of the approximately 15.81 acres within the greater Specific Plan Area (Figure 2). The study area is within the Del Mar OE W U.S. Geological Survey 7.5-minute quadrangle in Section 2, Township 14 South, Range 4 West, latitude 32°58'43" and longitude 117°16'14". The study area is bordered by the Pacific Ocean to the west, Camino Del Mar to the east, North Bluff Preserve and Del Mar North Beach to the south, and residential to the north. Additionally, south of the study area, the San Dieguito River outlets into the Pacific Ocean.

2.2 Soils

The following soils are located in the study area: (1) marina loamy course sand, 2% to 9% slopes; (2) tidal flats; (3) terrace escarpments; and (4) coastal beaches.

2.3 Terrain

The study area is situated between approximately 11 and 96 feet above mean sea level in elevation.

2.4 Regulatory Setting

2.4.1 Multiple Species Conservation Plan

Several conservation planning efforts are currently in progress in San Diego County with the long-term goal of establishing a regional habitat reserve system that will protect native habitat lands and their associated biota. The ultimate goals of these plans are the establishment of biological reserve areas in conformance with the California Natural Community Conservation Planning Act, and to contribute to the preserve system already established by the approved Multiple Species Conservation Plan (MSCP) in southwestern San Diego County (County of San Diego 1998). The City is listed as a jurisdictional entity within the boundaries of the Final MSCP for the County of San Diego (1998), and in the process of developing an MSCP Subarea Plan, although no draft has been circulated to the public.

2.4.2 California Coastal Commission and Local Coastal Program

Under the California Coastal Act, the California Coastal Commission (CCC) regulates the "coastal zone" and requires a Coastal Development Permit for development within this zone. The act also directs each coastal city or county to prepare a Local Coastal Program (LCP) to guide development in the coastal zone, which is certified by the CCC (California Public Resources

Code, Section 30500). After an LCP has been approved, the permitting authority of the CCC is transferred to the local government. The City's Land Use Plan (City of Del Mar 1993) is an approved LCP. The proposed project is located within the boundaries of the coastal zone and is consistent with the applicable zoning (City of Del Mar 1993).

2.4.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits the take of any migratory bird or any part, nest, or eggs of any such bird. Under the MBTA, "take" is defined as pursuing, hunting, shooting, capturing, collecting, or killing, or attempting to do so (16 U.S.C. 703 et seq.). Additionally, Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," requires that any project with federal involvement address impacts of federal actions on migratory birds with the purpose of promoting conservation of migratory bird populations (66 FR 3853–3856). The order requires federal agencies to work with the U.S. Fish and Wildlife Service (USFWS) to develop a memorandum of understanding. USFWS reviews actions that might affect these species.

SOURCE: Esri Basemaps

0 5 10 Miles

FIGURE 1

Regional Map

Del Mar Resort Project

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Study Area

SOURCE: USGS 7.5-Minute Series Del Mar Quadrangle

0 1,000 2,000 Feet

FIGURE 2

Vicinity Map

Del Mar Resort Project

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3 METHODS

3.1 Literature Review

Special-status biological resources present or potentially present in the study area were identified through a literature search conducted in 2017 for the study area. The following sources were used during the literature review process.

- USFWS National Wetlands Inventory was used for Geographic Information System (GIS) data (USFWS 2017a).
- USFWS Critical Habitat and Occurrence Data (USFWS 2017b) was consulted for data within 5 miles of the study area.
- California Natural Diversity Database (CNDDB) (CDFW 2017a) was queried to compile a list of potentially occurring flora and fauna in the Del Mar OE W quadrangle and surrounding five quadrangles.
- California Native Plant Society (CNPS) Inventory of Rare, Threatened, and Endangered Plants of California, 8th online edition (CNPS 2017), was searched to compose a list of potentially occurring flora in the Del Mar OE W quadrangle and surrounding five quadrangles.

Additionally, a tree inventory conducted by Rappoport Development Consulting Services LLC (2017) was used to map the Monterey cypress (*Hesperocyparis macrocarpa*) (California Rare Plant Rank [CRPR] 1B.2) and Torrey pine (*Pinus torreyana* ssp. *torreyana*) (CRPR 1B.2). The inventory was also used to describe existing conditions in the study area.

3.2 Field Reconnaissance

Dudek biologist Megan Enright conducted vegetation mapping and habitat assessment for special-status plants, and biologist Patricia Schuyler conducted a habitat assessment for special-status wildlife. Margie Mulligan, Dudek biologist, conducted a focused survey for special-status plants. Table 1 lists the dates, conditions, and survey focus for the 2017 and 2018 surveys.

Table 1
Schedule of Surveys

Date	Hours	Personnel	Survey Type	Conditions On Site
08/11/17	9:30 a.m.–1:30 p.m.	Megan Enright	Vegetation mapping and habitat assessment for special-status plants	69ºF–75ºF, 100% cc, 3–10 mph winds

Table 1
Schedule of Surveys

Date	Hours	Personnel	Survey Type	Conditions On Site
09/06/17	9:00 a.m.–11:00 a.m.	Megan Enright	Vegetation mapping and habitat assessment for special-status plants	74ºF, 30%–100% cc, 4–10 mph winds
09/06/17	9:00 a.m.–11:00 a.m.	Patricia Schuyler	Habitat assessment for special-status wildlife	74ºF, 30%–100% cc, 4–10 mph winds
05/22/18	8:30 a.m.–1:45 p.m.	Margie Mulligan	Focused survey for special-status plants	61ºF–73ºF, 70%–50% cc
05/25/18	6:50 a.m.–8:57 a.m.	Anita Hayworth, PhD	Focused survey for coastal California gnatcatcher	58°F–64°F; 70%–80% cc, 2–5 mph winds
06/01/18	7:05 a.m.–8:50 a.m.	Anita Hayworth	Focused survey for coastal California gnatcatcher	63°F, 60%–80% cc, 1–3 mph winds
06/08/18	7:03 a.m.–8:49 a.m.	Anita Hayworth	Focused survey for coastal California gnatcatcher	61°F–63°F, 30%–50% cc, 0–3 mph winds
06/15/18	7:04 a.m.–8:31 a.m.	Anita Hayworth	Focused survey for coastal California gnatcatcher	66°F–67°F, 70%–100% cc, 0–3 mph winds
06/22/18	6:45 a.m.–8:47 a.m.	Anita Hayworth	Focused survey for coastal California gnatcatcher	63°F–64°F, 100% cc, 0–3 mph winds
06/29/18	6:42 a.m.–8:23 a.m.	Anita Hayworth	Focused survey for coastal California gnatcatcher	63°F, 100% cc, 1–5 mph winds

Note: ºF = degrees Fahrenheit; cc = cloud cover; mph = miles per hour

3.2.1 Vegetation Community and Land Cover Mapping

Vegetation communities and land uses were mapped in the field using both a Trimble GeoXT Global Positioning System (GPS) and mapping directly onto a 100 foot-scale (1 inch = 100 feet) aerial photograph-based field map of the study area. Following completion of the fieldwork, all vegetation polygons were digitized using ArcGIS, and a GIS coverage was created. Once in ArcGIS, the acreage of each vegetation community and land cover present on site was determined. The vegetation community and land cover mapping generally follows the classifications described by Holland (1986). In some cases, Oberbauer et al. (2008) is also used as a reference, especially regarding non-native vegetation communities and land cover types. The nomenclature for vegetation communities in the study area follows the Manual of California Vegetation and the California Natural Community List (CDFW 2018a) was used for Menzies's golden bush scrub because there was no equivalent community represented in Holland (1986) or Oberbauer. Vegetation mapping was conducted in August and September 2017 by Dudek biologists Megan Enright and Patricia Schuyler (Table 1).

3.2.2 Jurisdictional Delineation

A formal jurisdictional delineation was not conducted on the site; however, the site was assessed for features that could be considered jurisdictional by the U.S. Army Corps of Engineers (ACOE), California Department of Fish and Wildlife (CDFW), Regional Water Quality Control Board (RWQCB), and CCC.

3.2.3 Flora

During the habitat assessment and focused survey for special-status plants, naturalized plant species encountered on site were identified and recorded. Latin and common names for plant species with a CRPR (formerly CNPS List) follow the Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2016). For plant species without a CRPR, Latin names follow the Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California (Jepson Flora Project 2016), and common names follow the California Natural Community List (CDFW 2018a) or the U.S. Department of Agriculture Natural Resources Conservation Service Plants Database (USDA 2016).

On May 22, 2018, Ms. Mulligan conducted a special-status plant survey. Focused plant surveys were floristic in nature and conformed to the "CNPS Botanical Survey Guidelines" (CNPS 2001), *Protocols for Surveying and Evaluating Impacts to Special Status Native Populations and Natural Communities* (CDFG 2009), and "General Rare Plant Survey Guidelines" (Cypher 2002). The plant species detected during field surveys were identified to subspecies or variety, if applicable and feasible. Detected species that could not be identified to subspecies or variety were limited to species that do not have a subspecies or variety that is special status. Survey times and conditions are reported in Table 1.

A list of plant species observed in the study area during initial surveys is presented in Appendix A.

3.2.4 Fauna

Dudek biologists walked the entire study area to identify and record wildlife species, as detected during field surveys by sight, calls, tracks, scat, or other signs. Binoculars (7×50 power) were used to aid in the identification of observed wildlife. In addition to species actually observed, expected wildlife use of the site was determined according to known habitat preferences of regional wildlife species and knowledge of their relative distributions in the area. No trapping or focused surveys for special-status or nocturnal species was conducted. Latin and common names of animals follow Crother (2012) for reptiles and amphibians, American Ornithologists' Union (2017) for birds, Wilson and Reeder (2005) for mammals, and North American Butterfly Association (NABA 2017) or San Diego Natural History Museum (SDNHM 2002) for butterflies. A cumulative list of wildlife species observed within the study area is presented in Appendix B.

Suitable habitat for coastal California gnatcatcher (*Polioptila californica californica*) within and adjacent to the study area was surveyed six times by Dudek wildlife biologist Anita Hayworth, PhD, Permit No. TE-780184, according to the schedule in Table 1. The surveys were conducted in conformance with the currently accepted protocol of USFWS (1997) for projects that are not within a Natural Communities Conservation Plan jurisdiction, except for the requested deviation of starting immediately without the 15-day notification period. A tape of recorded coastal California gnatcatcher vocalizations played approximately every 50 to 100 feet was used to induce responses from potentially present coastal California gnatcatcher. In accordance with the protocol, if a coastal California gnatcatcher was detected, the recorded playback was terminated to minimize potential for harassment; however, no coastal California gnatcatcher were observed. A 100-scale (1 inch = 100 feet) aerial photograph of the study area overlaid with the vegetation and site boundaries was used to map resources. Binoculars (10 x 42 strength) were used to aid in detecting and identifying bird species. Weather conditions, time of day, and season were appropriate for the detection of coastal California gnatcatcher.

3.2.5 Special-Status and/or Regulated Resources

Endangered, rare, or threatened species, as defined in CEQA Guideline Section 15380(b) (14 CCR 15000 et seq.), are referred to as "special-status species" in this BTR and include (1) endangered or threatened species recognized in the context of the California Endangered Species Act and the federal Endangered Species Act; (2) plant species with a CRPR (CDFW 2017b) (Lists 1A, 1B, and 2); (3) California Species of Special Concern, as designated by the CDFW (2017c); (4) mammals and birds that are fully protected species, as described in the California Fish and Game Code, Sections 4700 and 3511 (CDFW 2017b); and (5) Birds of Conservation Concern, as designated by the USFWS (USFWS 2008). Vegetation communities are considered sensitive natural communities or special-status vegetation communities if they have a conservation status of S1, S2, or S3 (CDFW 2018a).

3.2.6 Survey Limitations

The vegetation mapping and habitat assessment were conducted during the day and during the months of the year when most perennials would have been evident or identifiable. Additionally, a focused survey for special-status plants was conducted in the spring. Due to the timing of the surveys, summer and fall blooming annual species and cryptic perennials may not have been detectable; however, the focused survey for special-status plants identified the presence of special-status plants with the potential to occur. A wildlife reconnaissance survey was conducted to establish a general baseline of wildlife diversity within the study area. A focused survey for coastal California gnatcatcher, which consisted of six visits, was conducted in May and June 2018. These surveys were conducted during the daytime, which usually results in few observations of mammals, many of which may be active at night. In addition, many species of reptiles are nocturnal or cryptic in their habits and are difficult to observe.

4 RESULTS

4.1 Vegetation Communities, Land Covers, and Floral Diversity

There are two native vegetation communities within the study area: southern coastal bluff scrub and Menzies's golden bush scrub. There are three non-natural land covers: ornamental, disturbed habitat, and urban/developed. There are two non-vegetated land covers: beach and cliff. Southern coastal bluff scrub and Menzies's golden bush scrub are considered sensitive natural communities, or special-status, under CEQA. Sensitive or special-status natural communities are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. These communities may or may not contain special-status species or their habitat (CDFG 2009). These vegetation communities and land cover types are described in this section, their acreages are presented in Table 2, and their spatial distributions are presented on Figure 3.

Table 2
Vegetation Alliances or Land Covers within the Study Area

Generalized Habitat Type	Alliance or Land Cover Type	Acres in the Study Area
Scrub	Southern coastal bluff scrub	0.66
	Scrub Total	*0.66*
Non-natural land covers	Ornamental	4.15
	Disturbed habitat	9.18
	Urban/developed	1.79
	Non-Natural Land Covers Total	*15.12*
Non-vegetated land covers	Beach	0.02
	Cliff	0.02
	Non-Natural Land Covers Total	*0.04*
	Grand Total[1]	**15.81**

Note:
[1] Totals do not sum due to rounding.

4.1.1 Scrub

Within the study area, southern coastal bluff scrub is the only vegetation community in the scrub general habitat type. This vegetation community is described below.

4.1.1.1 Southern Coastal Bluff Scrub

According to Holland (1986), southern coastal bluff scrub is a native vegetation community composed of a variety dwarf shrubs, herbaceous perennials, and annuals. Most plants are woody

and/or succulent. This community is characteristically found in areas exposed to moisture-laden winds with high salt content. The soils are usually rocky and poorly developed. Typical plant species found in this habitat include saltbush (*Atriplex* spp.), island false bindweed (*Calystegia macrostegia*), coast Indian paintbrush (*Castilleja affinis*), Orcutt's spineflower (*Chorizanthe orcuttiana*), giant coreopsis (*Leptosyne gigantea*), sea dahlia (*Leptosyne maritima*), dudleya (*Dudleya* ssp.), California brittle bush (*Encelia californica*), seaside fleabane (*Erigeron glaucus*), seaside woolly sunflower (*Eriophyllum staechadifolium*), ice plant (*Mesembryanthemum* ssp.), cliff desert dandelion (*Malacothrix saxatilis*), Cucamonga manroot (*Marah macrocarpa*), coast prickly pear (*Opuntia littoralis*), lemonadeberry (*Rhus integrifolia*), and common ice plant (*Mesembryanthemum crystallinum*).

The dominant species in the southern coastal bluff scrub within the study area varies, but in general, southern coastal bluff scrub is dominated by California brittle bush, California buckwheat (*Eriogonum fasciculatum*), bladderpod spiderflower (*Peritoma arborea*), and quailbush (*Atriplex lentiformis*), but it also contains species such as coastal cholla (*Cylindropuntia prolifera*), strawberry cactus (*Mammillaria dioica*), coast prickly pear, and fingertips (*Dudleya edulis*). The southern coastal bluff scrub in the study area is fairly disturbed and contains non-native species such as slenderleaf ice plant (*Mesembryanthemum nodiflorum*), ice plant (*Carpobrotus edulis*), coppery mesemb (*Malephora crocea*), common ice plant (*Mesembryanthemum crystallinum*), and Perez's sea lavender (*Limonium perezii*).

Status

Southern coastal bluff scrub is ranked by the CDFW as a G1S1.1 (CDFW 2018a). This ranking indicates that globally and within California, this community is critically imperiled (Faber-Langendoen et al. 2012). Additionally, this community is considered rare in Holland (1986). Thus, southern coastal bluff scrub is considered a sensitive biological resource under CEQA.

4.1.2 Non-Natural Land Covers

There are three classes of non-natural land covers within the study area. While unlikely to support special-status species, due to the high level of disturbance and previous grading, the sections below describe the three non-natural land covers found in the study area.

SOURCE: SANGIS 2017

DUDEK

0 75 150 Feet

FIGURE 3

Biological Resources Map

Del Mar Resort Project

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4.1.2.1 Ornamental

Although not recognized by the Holland (1986) or CDFW (2018b), ornamental land covers are areas where non-native ornamentals and landscaping have been installed. Ornamental plantings typically function to maintain aesthetics, as a screening, or for erosion control.

The majority of the ornamental landscaping is associated with the existing residence. There is also some ornamental landscaping that remains on the parcels that previously had residences. Monterey cypress (CRPR 1B.2) and Torrey pine (CRPR 1B.2) are present in some of the areas mapped as ornamental as noted on Figure 3. Additionally, other ornamental species in the study area included species such as Norfolk Island pine (*Araucaria heterophylla*), Rusty leaf fig (*Ficus rubiginosa*), Myoporum (*Myoporum laetum*), Cajeput tree (*Melaleuca leucadendra*), New Zealand Christmas tree (*Metrosideros excelsa*), Canary Island date palm (*Phoenix canariensis*), Aleppo pine (*Pinus halepensis*), Italian stone pine (*Pinus pinea*), Brazilian pepper tree (*Schinus terebinthifolius*), and Washington fan palm (*Washingtonia robusta*).

Status

The CDFW does not consider the ornamental land cover a sensitive vegetation community under CEQA (CDFW 2018a).

4.1.2.2 Disturbed Habitat

Although not recognized by Holland (1986) or CDFW (2018a), disturbed habitats are areas that have been physically disturbed and no longer recognizable as a native or naturalized vegetation association. If vegetation is present, it is characterized by predominantly non-native species introduced and established through human action. These areas are not typically artificially irrigated.

Within the study area, disturbed habitat is fairly prevalent because two of the parcels in the study area were previously home sites. The area of disturbed habitat appears to be regularly maintained due to a lack of vegetation. Areas that did contain vegetation consisted of ice plant mats containing species such as slenderleaf ice plant, ice plant, coppery mesemb, and common ice plant and other non-native species such as crowndaisy (*Glebionis coronaria*), nettleleaf goosefoot (*Chenopodium murale*), Mexican tea (*Dysphania ambrosioides*), tree tobacco (*Nicotiana glauca*), greenspot nightshade (*Solanum douglasii*), Canadian horseweed (*Erigeron canadensis*), and New Zealand spinach (*Tetragonia tetragonioides*).

Status

Disturbed lands are either devoid of vegetation or dominated by a collection of non-native species and are not considered a sensitive vegetation community by CDFW under CEQA (CDFW 2018a).

4.1.2.3 Urban/Developed

Although not recognized by Holland (1986) or CDFW (2018a), urban/developed refers to areas that have been constructed upon or disturbed so severely that native vegetation is no longer supported. Developed land includes areas with permanent or semi-permanent structures, pavement or hardscape, and areas with a large amount of debris or other materials.

Urban/developed land in the study area includes the existing residence and a decomposed granite driveway and turnaround. At the North Bluff Preserve the existing staircase and brow ditch was also mapped as urban/developed.

Status

Urban/developed land typically does not support any vegetation or is a landscaped area and is not considered a sensitive vegetation community by CDFW under CEQA (CDFW 2018a).

4.1.3 Non-Vegetated Areas

4.1.3.1 Beach

Although not recognized by Holland (1986) or CDFW (2018a), beach refers to the sandy shore between the ocean and cliff.

Status

Beach typically does not support any vegetation and is not considered a sensitive vegetation community by CDFW under CEQA (CDFW 2018a).

4.1.3.2 Cliff

Although not recognized by Holland (1986) or CDFW (2018a), cliff refers to the steep rock face areas with minimal vegetation. The City's Land Use Plan, an approved LCP, requires a 40-foot setback from the edge of the coastal bluff in order to preserve coastal bluffs (City of Del Mar 1993).

Status

Cliff typically does not support any vegetation and is not considered a sensitive vegetation community by CDFW under CEQA (CDFW 2018a).

4.3 Flora

A total of 84 species of native or naturalized plants, 37 native (44%) and 47 non-native (56%), was recorded in the study area (see Appendix A). The site is heavily disturbed and contains areas with ornamental plantings, which account for the large proportion of non-native species. The majority of native species are in the southern portion of the study area, which includes the North Bluff Preserve area and is dominated by southern coastal bluff scrub.

4.4 Wildlife

The study area supports habitat for species commonly occurring in urban areas. A list of the wildlife species observed within the study area during the vegetation mapping and habitat assessments is provided in Appendix B. There were 25 wildlife species observed or assumed to be present based on sign in the study area.

Two reptile species were observed within and adjacent to the study area during surveys: common side-blotched lizard (*Uta stansburiana*) and western fence lizard (*Sceloporus occidentalis*). In total, 22 bird species were detected during the biological surveys. Common species observed within the study area include mourning dove (*Zenaida macroura*), house finch (*Haemorhous mexicanus*), Anna's hummingbird (*Calypte anna*), black phoebe (*Sayornis nigricans*), American crow (*Corvus brachyrhynchos*), and western gull (*Larus occidentalis*). In addition, two red-shouldered hawks (*Buteo lineatus*) were observed foraging throughout the open disturbed portions of the study area. Although though not directly observed, there are several small burrows throughout the site, which indicates the presence of California ground squirrel (*Spermophilus beecheyi*).

4.5 Special-Status Plants and Wildlife

4.5.1 Special-Status Plant Species

Two special-status plant were identified within the study area: Monterey cypress (CRPR 1B.2) and Torrey pine (CRPR 1B.2). The Monterey cypress and Torrey pine were associated with the developed or previously developed portions of the site and appear to have been planted. There are approximately 49 Monterey cypress and 12 Torrey pines located within the study area.

Several special-status plant species have the potential to occur in the study area within the southern coastal bluff scrub (Table 3). Those that occur in the region but that are not expected to occur in the study area, due to a lack of suitable habitat, for example, are included in Appendix C. These species are not discussed further because no significant direct, indirect, or cumulative impacts are expected to result from the proposed project. While not considered special status under CEQA, two individuals of California box-thorn (*Lycium californicum*) were observed in the southern coastal bluff scrub. California box-thorn has a CRPR of 4.2, which indicates that, while the species is limited in distribution, its vulnerability or susceptibility to threat appears low at this time (CDFW 2018b).

There are 17 special-status plant species that, prior to conducting focused surveys for special-status plants, were considered to have a moderate potential to occur within the on-site southern coastal bluff scrub and include the following: Nuttall's acmispon (*Acmispon prostratus*) (CRPR 1B.1), San Diego ambrosia (*Ambrosia pumila*) (federally listed endangered and CRPR 1B.1), aphanisma (*Aphanisma blitoides*) (CRPR 1B.2), coastal dunes milk-vetch (*Astragalus tener* var. *titi*) (federally and state-listed, CRPR 1B.1), Coulter's saltbush (*Atriplex coulteri*) (CRPR 1B.2), South Coast saltscale (*Atriplex pacifica*) (CRPR 1B.2), Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*) (CRPR 1B.1), Orcutt's spineflower (*Chorizanthe orcuttiana*) (federally and state-listed, CRPR 1B.1), San Diego sand aster (*Corethrogyne filaginifolia* var. *incana*) (CRPR 1B.1), Del Mar Mesa sand aster (*Corethrogyne filaginifolia* var. *linifolia*) (CRPR 1B.1), short-leaved dudleya (*Dudleya brevifolia*) (state-listed endangered and CRPR 1B.1), sticky dudleya (*Dudleya viscida*) (CRPR 1B.2), beach goldenaster (*Heterotheca sessiliflora* ssp. *sessiliflora*) (CRPR 1B.1), decumbent goldenbush (*Isocoma menziesii* var. *decumbens*) (CRPR 1B.1), sea dahlia (*Leptosyne maritima*) (CRPR 2B.2), light gray lichen (*Mobergia calculiformis*) (CRPR 3), and chaparral ragwort (*Senecio aphanactis*) (CRPR 2B.2). Following the special-status plant survey in May 2018, these special-status plants are not expected to occur in the study area. Within the non-natural land covers, including ornamental, disturbed habitat, and urban/developed, special-status plants are either not expect to occur or would have a low potential to occur in the study area.

Table 3
Special-Status Plant with Potential to Occur

Scientific Name	Common Name	Status (Federal/State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur Prior to Survey	Potential to Occur Following Survey
Acanthomintha ilicifolia	San Diego thorn-mint	FT/CE/1B.1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; clay, openings/annual herb/Apr–June/33–3,150	Low potential to occur due to lack of appropriate soils.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Acmispon prostratus	Nuttall's acmispon	None/None/1B.1	Coastal dunes, coastal scrub (sandy)/annual herb/Mar–June (July)/0–33	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Agave shawii var. *shawii*	Shaw's agave	None/None/2B.1	Coastal bluff scrub, coastal scrub/perennial leaf succulent/Sep–May/10–394	Low potential to occur. Conspicuous perennial that likely would have been observed if present.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Ambrosia pumila	San Diego ambrosia	FE/None/1B.1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; sandy loam or clay, often in disturbed areas, sometimes alkaline/perennial rhizomatous herb/Apr–Oct/66–1,362	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Aphanisma blitoides	aphanisma	None/None/1B.2	Coastal bluff scrub, coastal dunes, coastal scrub; sandy or gravelly/annual herb/Mar–June/3–1,001	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Astragalus tener var. *titi*	coastal dunes milk-vetch	FE/CE/1B.1	Coastal bluff scrub (sandy), coastal dunes, coastal prairie (mesic); often vernally mesic areas/annual herb/Mar–May/3–164	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status

Table 3
Special-Status Plant with Potential to Occur

Scientific Name	Common Name	Status (Federal/State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur Prior to Survey	Potential to Occur Following Survey
					plants.
Atriplex coulteri	Coulter's saltbush	None/None/1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland; alkaline or clay/perennial herb/Mar–Oct/10–1,509	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Atriplex pacifica	South Coast saltscale	None/None/1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, playas/annual herb/Mar–Oct/0–459	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Bergerocactus emoryi	golden-spined cereus	None/None/2B.2	Closed-cone coniferous forest, chaparral, coastal scrub; sandy/perennial stem succulent/May–June/10–1,296	Low potential to occur. Conspicuous perennial that likely would have been observed if present.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Brodiaea filifolia	thread-leaved brodiaea	FT/CE/1B.1	Chaparral (openings), cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools; often clay/perennial bulbiferous herb/Mar–June/82–3,675	Low potential to occur due to lack of clay soils.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Chaenactis glabriuscula var. *orcuttiana*	Orcutt's pincushion	None/None/1B.1	Coastal bluff scrub (sandy), coastal dunes/annual herb/Jan–Aug/0–328	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Chorizanthe orcuttiana	Orcutt's spineflower	FE/CE/1B.1	Closed-cone coniferous forest, chaparral (maritime), coastal scrub; sandy	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused

Table 3
Special-Status Plant with Potential to Occur

Scientific Name	Common Name	Status (Federal/State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur Prior to Survey	Potential to Occur Following Survey
			openings/annual herb/Mar–May/10–410		survey for special-status plants.
Chorizanthe polygonoides var. *longispina*	long-spined spineflower	None/None/1B.2	Chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools; often clay/annual herb/Apr–July/98–5,020	Low potential to occur due to lack of suitable clay soils.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Corethrogyne filaginifolia var. *incana*	San Diego sand aster	None/None/1B.1	Coastal bluff scrub, chaparral, coastal scrub/perennial herb/June–Sep/10–377	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. While species was not in bloom during focused survey, no *Corethrogyne* species were observed in vegetative state.
Corethrogyne filaginifolia var. *linifolia*	Del Mar Mesa sand aster	None/None/1B.1	Coastal bluff scrub, chaparral (maritime, openings), coastal scrub; sandy/perennial herb/May–Sep/49–492	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Cryptantha wigginsii	Wiggins' cryptantha	None/None/1B.2	Coastal scrub; often clay/annual herb/Feb–June/66–902	Low potential to occur due to lack of clay soils.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Cylindropuntia californica var. *californica*	snake cholla	None/None/1B.1	Chaparral, coastal scrub/perennial stem succulent/Apr–May/98–492	Low potential to occur. Conspicuous perennial that likely would have been observed if present.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Dudleya blochmaniae ssp.	Blochman's	None/None/1B.1	Coastal bluff scrub, chaparral, coastal scrub, valley and foothill grassland; rocky, often clay	Low potential to occur due to lack of rocky, clay or	Not expected to occur. Species would have been

Table 3
Special-Status Plant with Potential to Occur

Scientific Name	Common Name	Status (Federal/State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur Prior to Survey	Potential to Occur Following Survey
blochmaniae	dudleya		or serpentinite/perennial herb/Apr–June/16–1,476	serpentinite soils.	detected during focused survey for special-status plants.
Dudleya brevifolia	short-leaved dudleya	None/CE/1B.1	Chaparral (maritime, openings), coastal scrub; Torrey sandstone/perennial herb/Apr–May/98–820	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Dudleya variegata	variegated dudleya	None/None/1B.2	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland, vernal pools; clay/perennial herb/Apr–June/10–1,903	Low potential to occur due to lack of clay soils.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Dudleya viscida	sticky dudleya	None/None/1B.2	Coastal bluff scrub, chaparral, cismontane woodland, coastal scrub; rocky/perennial herb/May–June/33–1,804	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Ericameria palmeri var. *palmeri*	Palmer's goldenbush	None/None/1B.1	Chaparral, coastal scrub; mesic/perennial evergreen shrub/(July) Sep–Nov/98–1,969	Low potential to occur. Conspicuous perennial that likely would have been observed if present.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Euphorbia misera	cliff spurge	None/None/2B.2	Coastal bluff scrub, coastal scrub, Mojavean desert scrub; rocky/perennial shrub/Dec–Aug (Oct)/33–1,640	Low potential to occur. Conspicuous perennial that likely would have been observed if present.	Not expected to occur. Species would have been detected during focused survey for special-status plants.

Table 3
Special-Status Plant with Potential to Occur

Scientific Name	Common Name	Status (Federal/State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur Prior to Survey	Potential to Occur Following Survey
Ferocactus viridescens	San Diego barrel cactus	None/None/2B.1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools/perennial stem succulent/May–June/10–1,476	Low potential to occur. Conspicuous perennial that likely would have been observed if present.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Geothallus tuberosus	Campbell's liverwort	None/None/1B.1	Coastal scrub (mesic), vernal pools; soil/ephemeral liverwort/N.A./33–1,969	Low potential to occur due to lack of mesic conditions and vernal pools.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Heterotheca sessiliflora ssp. *sessiliflora*	beach goldenaster	None/None/1B.1	Chaparral (coastal), coastal dunes, coastal scrub/perennial herb/Mar–Dec/0–4,019	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Isocoma menziesii var. *decumbens*	decumbent goldenbush	None/None/1B.2	Chaparral, coastal scrub (sandy, often in disturbed areas)/perennial shrub/Apr–Nov/33–443	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Leptosyne maritima	sea dahlia	None/None/2B.2	Coastal bluff scrub, coastal scrub/perennial herb/Mar–May/16–492	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Mobergia calculiformis	light gray lichen	None/None/3	Coastal scrub (?); on rocks/crustose lichen (saxicolous)/N.A./33–33	Moderate potential to occur in suitable bluff scrub.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Navarretia prostrata	prostrate vernal pool navarretia	None/None/1B.1	Coastal scrub, meadows and seeps, valley and foothill grassland (alkaline), vernal pools; mesic/annual herb/Apr–July/10–3,970	Low potential to occur due lack of alkaline areas and vernal pools.	Not expected to occur. Species would have been detected during focused survey for special-status plants.

Table 3
Special-Status Plant with Potential to Occur

Scientific Name	Common Name	Status (Federal/State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur Prior to Survey	Potential to Occur Following Survey
Phacelia stellaris	Brand's star phacelia	None/None/1B.1	Coastal dunes, coastal scrub/annual herb/Mar–June/3–1,312	Low potential to occur. Suitable coastal dune habitat not present.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Quercus dumosa	Nuttall's scrub oak	None/None/1B.1	Closed-cone coniferous forest, chaparral, coastal scrub; sandy, clay loam/perennial evergreen shrub/Feb–Apr (Aug)/49–1,312	Low potential to occur. Conspicuous perennial that likely would have been observed if present.	Not expected to occur. Species would have been detected during focused survey for special-status plants.
Senecio aphanactis	chaparral ragwort	None/None/2B.2	Chaparral, cismontane woodland, coastal scrub; sometimes alkaline/annual herb/Jan–Apr/49–2,625	Moderate potential to occur in suitable bluff scrub.	Low potential to occur. While species was not in bloom during survey, no *Senecio* species were observed in vegetative state.
Sidalcea neomexicana	salt spring checkerbloom	None/None/2B.2	Chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, playas; alkaline, mesic/perennial herb/Mar–June/49–5,020	Low potential to occur. Alkaline and mesic habitat not present.	Not expected to occur. Species would have been detected during focused survey for special-status plants.

Status Legend
FE: Federally listed as endangered.
FT: Federally listed as threatened.
CE: State listed as endangered.
CRPR
1B: Plants rare, threatened, or endangered in California and elsewhere
2B: Plants rare, threatened, or endangered in California, but more common elsewhere
3: Plants about which more information is needed – a review list
Threat Rank
.1 – Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 – Fairly threatened in California (20%–80% occurrences threatened/moderate degree and immediacy of threat)
.3 – Not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

4.5.2 Special-Status Wildlife Species

No special-status wildlife species were observed during the surveys conducted during 2017 and 2018. Since the City does not have a final subarea plan and the draft plan is not available to the public, occurrence data and the potential for special-status wildlife species to occur is based upon a CNDDB search for the study area (CDFW 2017a). Appendix D lists occurrences of special-status wildlife species reported in the U.S. Geological Survey 7.5-minute Del Mar OE W quadrangle and the surrounding five topographic quadrangles resulting from a CNDDB search (CDFW 2017a). This appendix also analyzes each of these special-status species' occurrence or potential to occur based on known range, habitat associations, and elevation. The only native vegetation community present, southern coastal bluff scrub, has been invaded by exotic plant species, is subject to indirect effects from the public and domestic pet use at the beach, and is a relatively small and isolated patch of scrub (only 0.66 acres). The majority of the study area is very disturbed with existing structures and several acres of ornamental plantings. Thus, no special-status wildlife are expected to use the study area.

4.6 Wildlife Corridors and Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Wildlife corridors contribute to population viability by assuring continual exchange of genes between populations, providing access to adjacent habitat areas for foraging and mating, and providing routes for recolonization of habitat after local extirpation or ecological catastrophes (e.g., fires).

Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation. Habitat linkages provide a potential route for gene flow and long-term dispersal of plants and animals and may also serve as primary habitat for smaller animals, such as reptiles and amphibians. Habitat linkages may be continuous habitat or discrete habitat islands that function as stepping stones for dispersal.

The study area is located directly adjacent to San Dieguito River outlet, which functions as a wildlife corridor/habitat linkage from the San Dieguito River and associated lagoon to the ocean. The San Dieguito River and associated lagoon area is mapped as a Biological Core Area in the Final MSCP, which are defined as areas generally supporting a high concentration of sensitive biological resources which, if lost or fragmented, could not be replaced or mitigated elsewhere (County of San Diego 1998). The site itself, however, is very disturbed with existing structures and several acres of ornamental plantings. The disturbed nature of the site, existing development, and highly urbanized surroundings would likely deter any wildlife from using the site for movement between areas of habitat, and therefore it does not function as a wildlife corridor/habitat linkage.

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5 PROJECT IMPACTS AND SIGNIFICANCE DETERMINATIONS

The purpose of Section 5 is to describe the direct and indirect impacts of the proposed project on special-status biological resources and whether the proposed impacts are a significant impact under CEQA.

According to Appendix G of the CEQA Guidelines, impacts to biological resources may be significant if a proposed project would:

1. 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 (**Threshold Bio-1**).
2. 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 CDFW or USFWS (**Threshold Bio-2**).
3. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means (**Threshold Bio-3**).
4. 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 (**Threshold Bio-4**).
5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (**Threshold Bio-5**).
6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan (**Threshold Bio-6**).

With respect to Threshold Bio-5, the City addresses the preservation of trees in its Municipal Code, Chapter 23.50 (Trees). The Public Tree Policy Manual (City of Del Mar 2004) establishes technical regulations, standards, and specifications needed to implement the tree ordinance. Trees addressed in the municipal code would be impacted by the proposed project. However, some healthy trees would be preserved in place or relocated. A Tree Removal Permit, as recommended by the Design Review Board and the City Council, would be required to cut down, remove, destroy, or move a protected tree. Therefore, the proposed project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

5.1 Definition of Impacts

Impacts are categorized as either temporary or construction-related impacts or permanent or long-term impacts and as either direct or indirect impacts. The definitions are described below.

Temporary or Construction-Related Impacts

For this project, the temporary or construction-related impacts are primarily indirect and include temporary effects that are immediately related to construction, such as the generation of construction-related dust. Temporary direct impacts were not quantified, and all ground disturbance was assumed to be permanent.

Permanent or Long-Term Impacts

Direct

Permanent direct impacts are impacts that result in the direct loss of biological resources due to grading and horizontal construction activities, such as the permanent loss of wildlife habitat or the permanent loss of or harm to individual special-status species. Permanent direct impacts were quantified by overlaying the limits of disturbance provided by the project engineer on GIS-mapped biological resources. The impact footprint was provided by Project Design Consultants and shown on Figure 4.

Indirect

Long-term, or permanent, indirect impacts result from the proximity of development to biological resources after the project has been built. Long-term indirect impacts to biological resources as a result of development adjacent to open space include various impacts, such as increased lighting and glare, that may affect wildlife species if directed into the adjacent preserve.

5.2 Impacts to Vegetation Communities and Land Covers

5.2.1 Permanent Direct Impacts

Implementation of the project would result in permanent direct impacts to 14.79 acres, including 14.52 acres of beach, ornamental, disturbed habitat, and urban/developed land covers, none of which are considered special status under CEQA (CDFW 2018b). Approximately 0.27 acre of southern coastal bluff scrub, a special-status vegetation community, would be permanently impacted (Figure 4). Therefore, the proposed project would result in significant direct impacts to special-status vegetation communities.

Construction of off-site improvements is not expected to result in direct impacts to special-status vegetation communities due to the developed nature of the proposed water line alternative locations, as described in Section 1.2, Project Description.

EPF BIO-1 (restoration of bluff scrub) requires preparation of a southern coastal bluff scrub restoration plan that includes at least 0.27 acres to be successfully restored to southern coastal bluff scrub to meet the success criteria.

Therefore, this potential permanent direct impact to southern coastal bluff scrub would be less than significant with implementation EPF BIO-1. This EPF is described in Section 6.2.

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SOURCE: SANGIS 2017

DUDEK

0 75 150 Feet

FIGURE 4

Limits of Disturbance

Del Mar Resort Project

INTENTIONALLY LEFT BLANK

5.2.2 Indirect Impacts

5.2.2.1 Construction-Related Indirect Impacts

Southern coastal bluff scrub may be indirectly impacted during construction. Potential short-term or temporary indirect impacts to southern coastal bluff scrub resulting from construction activities include impacts such as the generation of fugitive dust; changes in hydrology resulting from construction, including sedimentation and erosion; the release of chemical pollutants; and accidental clearing, trampling, or grading outside designated construction zones during construction activities. These potential short-term or temporary indirect impacts to southern coastal bluff scrub would be less than significant through compliance with existing regulations (ERs), including the City's Municipal Code, and with implementation of environmental protection features (EPFs).

Specifically, ER BIO-1 (water quality controls during construction) requires an erosion and sedimentation control plan be prepared and that no grading occur during the rainy season. Also, ER BIO-1 requires that graded slopes be stabilized before the start of the rainy season (i.e., November 15). ER BIO-9 (dust control) requires compliance with the San Diego Air Pollution Control District Rule 55 (Fugitive Dust), which would avoid and minimize impacts to special-status vegetation communities from fugitive dust by requiring dust control measures to be implemented during construction. ER BIO-10 (preparation and implementation of a Storm Water Pollution Prevention Plan [SWPPP]) would require the applicant to prepare a SWPPP that would prevent construction pollutants from contacting storm water, with the intent of keeping sedimentation or any other pollutants from moving off site. EPF BIO-2 (demarcation of southern coastal bluff scrub) would require demarcation of the construction area using clearly visible materials, so as to minimize unintentional impacts to adjacent southern coastal bluff scrub. No construction access, parking, or storage of equipment or materials will be permitted within 20 feet of such marked areas. EPF BIO-5 (contractor education program) requires that construction personnel are made aware of the sensitive biological resources; environmental training would aid in enforcing the requirements that construction must be restricted to designated areas. EPF BIO-6 (restrictions on equipment) would avoid and minimize the effects of chemical pollutants by requiring that staging and storage areas are located within the designated impact area; stationary equipment located adjacent to southern coastal bluff scrub is positioned over drip-pans or other containment devices; and equipment is moved away from the southern coastal bluff scrub before refueling or lubrication.

These potential short-term or temporary indirect impacts to southern coastal bluff scrub would be less than significant with implementation of ER BIO-1, ER BIO-9, ER BIO-10, EPF BIO-2, EPF BIO-5, and EPF BIO-6 (Threshold Bio-2). These existing regulations and EPFs are described in full in Section 6.

5.2.2.2 Long-Term Indirect Impacts

Potential long-term indirect impacts that could result from development near sensitive vegetation communities (i.e., southern coastal bluff scrub) include impacts such as hydromodification (erosion and sedimentation); the release of pollutants; increased invasive plant species that may degrade habitat; and trampling of vegetation and soil compaction by humans or pets, which could affect soil moisture, water penetration, surface flows, and erosion. These indirect impacts could degrade southern coastal bluff scrub over the long term. Potential long-term or permanent indirect impacts to southern coastal bluff scrub would be less than significant through compliance with existing regulations, including the City's Municipal Code, and with implementation of environmental protection features.

Specifically, ER BIO-2 (coastal bluff setback) requires that all new structures are set back a minimum of 40 feet from the top edge of the coastal bluff and no grading shall be allowed within 40 feet of the top edge of a coastal bluff. Setbacks would be the greater of 40 feet; or in accordance with the factor of safety as recommended by the geotechnical engineers. These setbacks would provide a buffer between the development and the North Bluff Preserve area, avoiding and minimizing indirect impacts to the adjacent southern coastal bluff scrub. ER BIO-3 (landscape and drainage plans) would avoid and minimize the effects of hydromodification by restricting the over watering of bluffs through use of drought-tolerant plant species and not allowing irrigation systems within 40 feet of the edge of the site's coastal bluff top, consistent with the setback parameters described in ER BIO-2. ER BIO-4 (drainage plans) would also avoid and minimize the effects of hydromodification by requiring the preparation of drainage plans that either convey drainage away from the coastal bluff and into an existing storm drain system or convey the drainage into a natural drainage course that has capacity to handle the flows and not impact the coastal bluffs. ER BIO-5 (polluted runoff control plan) requires preparation of a polluted runoff control plan that incorporates post-construction BMPs to minimize the discharge of pollutants and to maintain post-development peak runoff rate and average volume at levels similar to pre-development levels. Also, the polluted runoff control plan shall include a monitoring component to ensure long-term maintenance and evaluation of the effectiveness of the plan. Thus, ER BIO-5 would avoid and minimize the effects of pollutants on southern coastal bluff scrub. ER BIO-6 (storm water management and discharge controls) would avoid and minimize the effects of pollutants and erosion by requiring storm water to be managed as required in the City's Municipal Code. ER BIO-11 (pest control regulations) avoids and minimizes potential misuse of pesticides by requiring pesticide application comply with restrictions mandated by the U.S. Environmental Protection Agency and California Department of Pesticide Regulation. EPF BIO-7 (restrictions on use of invasive species) would help prevent adverse effects of invasive plant species that may alter the composition of the habitat if introduced through landscaping by restricting the use of invasive species in landscaping. EPF BIO-8 (signage and fencing) would avoid and minimize the

effects of trampling of vegetation by fencing and providing access via existing trails only and signage that informs users that habitat is sensitive and users must stay on existing trails. EPF-BIO-10 would ensure that native plant species consistent with species in surrounding native habitats would be used for any restoration planting.

These potential long-term indirect impacts to southern coastal bluff scrub would be less than significant with implementation of ER BIO-2, ER BIO-3, ER BIO-4, ER BIO-5, ER BIO-6, ER BIO-11, EPF BIO-7, EPF BIO-8, and EPF BIO-10 (Threshold Bio-2). These existing regulations and EPFs are described in full in Section 6.

5.3 Impacts to Jurisdictional Waters

There are no ACOE-, CDFW-, or RWQCB-jurisdictional waters of the United States and/or state in the study area. Prior to the start of construction, the impact area would be assessed for jurisdictional resources, and jurisdictional waters within 50 feet of construction activities would be flagged for avoidance. If it is determined that impacts cannot be avoided, then permits would be obtained from the appropriate regulatory agencies (ER BIO-12).

Therefore, through implementation of ER BIO-12, the proposed project would adhere to agency regulations and not result in significant permanent direct impacts to jurisdictional resources (Threshold Bio-1).

Potential indirect impacts to jurisdictional waters off site would be similar to those described for vegetation communities in Section 5.2 (Threshold Bio-3).

5.4 Impacts to Special-Status Plant Species

5.4.1 Permanent Direct Impacts

According to the MSCP, the only naturally occurring population of Torrey pines occurs at Torrey Pines State Preserve. Thus, the Torrey pines on site are considered planted and are not naturally occurring. Similarly, the site is outside of the known range of Monterrey cypress and the trees on site are considered planted and not naturally occurring. Therefore, permanent direct impacts to Torrey pine and Monterrey cypress are considered less than significant.

While the direct impacts are considered less than significant, the proposed project could result in the removal of approximately 42 protected trees that require a tree removal permit (ER BIO-8) and potentially mitigation. However, some healthy trees will be preserved in place or relocated. A Tree Removal Permit, as recommended by the Design Review Board and the City Council, would be required to cut down, remove, destroy, or move a protected tree, which includes Torrey

pine and Monterrey cypress. When recommending removal of a tree and determining whether or not mitigation measures are necessary, the Design Review Board and City Council should consider factors associated with the species of removed tree, the removal site, the surrounding area and its existing vegetation, and other factors. Upon decision of the City Council, the project applicant would either be required to replant the Torrey pines on site or pay a fee to the City's Tree Mitigation Fund in accordance with the City's Municipal Code Sections 23.50.080(C-10), 23.50.030(D)(2) and 23.50.090(A)(2).

Therefore, through implementation of ER BIO-8, the proposed project would adhere to City regulations and not result in significant permanent direct impacts to special-status plants (Threshold Bio-1).

5.4.2 Indirect Impacts

5.4.2.1 Construction-Related Indirect Impacts

There are no special-status plants in the habitat directly adjacent to the proposed project. Therefore, indirect impacts to special-status plants during construction are not anticipated and would be less than significant (Threshold Bio-1). Additionally, indirect impacts to special-status plants during construction of off-site improvements are not anticipated due to the developed nature of the proposed utility locations. Although construction-related indirect impacts to special-status plants would be less than significant, there are several regulations and EPFs, described in Section 6, that would further reduce any construction-related indirect impacts to special-status plants. Specifically, implementation of ER BIO-1, ER BIO-9, ER BIO-10, EPF BIO-2, EPF BIO-5, and EPF BIO-6 would further reduce construction-related indirect impacts to special-status plants.

5.4.2.2 Long-Term Indirect Impacts

There are no special-status plants in the habitat directly adjacent to the proposed project and special-status plants are not anticipated to occur adjacent to the off-site improvements area. Therefore, long-term indirect impacts to special-status plants are not anticipated and would be less than significant (Threshold Bio-1). Although long-term indirect impacts to special-status plants would be less than significant, there are several regulations and EPFs, described in Section 6, that would further reduce long-term indirect impacts to special-status plants. Specifically, implementation of ER BIO-2, ER BIO-3, ER BIO-4, ER BIO-5, ER BIO-6, ER BIO-11, EPF BIO-7, and EPF BIO-8 would further reduce long-term indirect impacts to special-status plants.

5.5 Impacts to Special-Status Wildlife Species

5.5.1 Permanent Direct Impacts

No special-status wildlife species were observed during any of the surveys conducted during 2017, and no special-status wildlife species are expected to use the study area or areas within and adjacent to the off-site improvements area due to the developed nature of the proposed project site.

The MBTA prohibits the take of any migratory bird or any part, nest, or eggs of any such bird. Under the MBTA, "take" is defined as pursuing, hunting, shooting, capturing, collecting, killing, or attempting to commit any of these acts (16 U.S.C. 703 et seq.). Note that impacts to habitat do not constitute take under this definition unless such impacts result in death of a migratory bird. Additionally, Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," requires that any project with federal involvement address impacts of federal actions on migratory birds with the purpose of promoting conservation of migratory bird populations (66 FR 3853–3856). The executive order requires federal agencies to work with the USFWS to develop a memorandum of understanding. USFWS reviews actions that might affect these species.

If any active nests or the young of nesting bird species are impacted through direct grading, these impacts would be considered significant, absent EPFs, based on the MBTA.

However, EPF BIO-3 requires pre-construction surveys for nesting birds, and if found, this EPF requires the nest to be flagged and mapped on the construction plans along with an appropriate buffer, which will be determined by the biologist based on the biology of the species. This restriction would avoid direct impacts to active bird nests (Threshold Bio-1).

5.5.2 Indirect Impacts

5.5.2.1 Short-Term Indirect Impacts

Although there is low potential, special-status wildlife species may be indirectly impacted during construction of the project and/or off-site utilities by impacts such as the generation of fugitive dust; changes in hydrology resulting from construction, including sedimentation and erosion; the release of chemical pollutants; and accidental clearing, trampling, or grading outside designated construction zones during construction activities. Special-status wildlife may also be indirectly affected in the short term by construction-related noise and lighting, which can disrupt normal activities and subject wildlife to higher predation risks. The majority of the study area is disturbed with existing structures and several acres of ornamental plantings and the off-site improvements would occur within an existing roadway surrounded by development. Thus, no

special-status wildlife are expected to occur in the study area or areas within and adjacent to the off-site improvements area. However, the study area is located adjacent to the San Dieguito Lagoon, which has the potential, albeit low, to support special-status wildlife. These potential short-term or temporary indirect impacts to special-status wildlife would be less than significant through compliance with existing regulations, including the City's Municipal Code, and with implementation of EPFs.

More specifically, ER BIO-1 (water quality controls during construction) requires the preparation of an erosion and sedimentation control plan, restricts grading during the rainy season, and requires that graded slopes be stabilized before the rainy season. ER BIO-7 (construction noise restrictions) requires the construction activity cause no more than an hourly average sound level of 75 decibels. ER BIO-9 (dust control) would avoid and minimize impacts to special-status plants from fugitive dust by requiring dust control measures to be implemented during construction. ER BIO-10 (preparation and implementation of a SWPPP) would require the applicant to prepare a SWPPP that would prevent construction pollutants from contacting storm water. EPF BIO-2 (demarcation of southern coastal bluff scrub) would require demarcation of the construction area using clearly visible materials, so as to minimize unintentional impacts the adjacent preserve. No construction access, parking, or storage of equipment or materials will be permitted within 20 feet of such marked areas. EPF BIO-3 (nesting bird surveys) would avoid and minimize indirect effects to nesting birds by adding a biologically appropriate buffer around nests during construction. EPF BIO-4 (construction nighttime lighting) prohibits construction lighting within 50 feet of the adjacent North Bluff Preserve area between sunset and sunrise to avoid and minimize the effects of lighting. EPF BIO-5 (contractor education program) requires contractor education that would aid in enforcing the requirements that construction must be restricted to designated areas. EPF BIO-6 (restrictions on equipment) would avoid and minimize the effects of chemical pollutants.

These potential short-term or temporary indirect impacts to special-status wildlife would be less than significant with implementation of ER BIO-1, ER BIO-7, ER BIO-9, ER BIO-10, EPF BIO-2, EPF BIO-3, EPF BIO-4, EPF BIO-5, and EPF BIO-6 (Threshold Bio-1). These existing regulations and EPFs are described in full in Section 6.

5.5.2.2 Long-Term Indirect Impacts

Special-status wildlife may be indirectly impacted after project build-out by impacts such as hydromodification (erosion and sedimentation); the release of pollutants; increased invasive plant species that may degrade habitat; and trampling of vegetation and soil compaction by humans or pets, which could affect soil moisture, water penetration, surface flows, and erosion. Special-status wildlife may also be indirectly affected in the long term by development-related lighting, which can disrupt

normal activities and subject wildlife to higher predation risks. Potential long-term indirect impacts to special-status wildlife varies by species. No special-status wildlife are expected to occur in the study area. However, the study area is located adjacent to the San Dieguito Lagoon, which has the potential to support special-status wildlife. These potential long-term indirect impacts to special-status wildlife would be less than significant through compliance with existing regulations, including the City's Municipal Code, and with implementation of EPFs. Long-term indirect impacts to special-status wildlife are not expected as a result of construction of the off-site improvements due to the placement of the utility lines within an existing roadway.

ER BIO-4 (drainage plans) would also avoid and minimize the effects of hydromodification by requiring the preparation of drainage plans. ER BIO-5 (polluted runoff control plan) requires preparation of a polluted runoff control plan that would avoid and minimize the effects of pollutants on suitable habitat for special-status wildlife. ER BIO-6 (storm water management and discharge) would avoid and minimize the effects of pollutants and erosion by requiring storm water to be managed as required in the City's Municipal Code. EPF BIO-7 (restrictions on use of invasive species) would help prevent adverse effects of invasive plant species that may alter the composition of the habitat by restricting the use of invasive species in landscaping. EPF BIO-9 (operations nighttime lighting) requires the use of shielded low-sodium, low-wattage lighting on all proposed building and accent lighting and to direct light away from sensitive biological resources.

These potential long-term indirect impacts to suitable habitat for special-status wildlife would be less than significant with implementation of ER BIO-4, ER BIO-5, ER BIO-6, EPF BIO-7, and EPF BIO-9 (Threshold Bio-1). These existing regulations and EPFs are described in full in Section 6.

5.6 Impacts to Wildlife Corridors and Habitat Connectivity

5.6.1 Permanent Direct Impacts

The study area is located directly adjacent to San Dieguito River outlet, which functions as a wildlife corridor/habitat linkage from the San Dieguito River and associated lagoon to the ocean. The site itself, however, is very disturbed with existing structures and several acres of ornamental plantings. The disturbed nature of the site, existing development, and highly urbanized surroundings would likely deter any wildlife from using the site for movement between areas of habitat, and therefore it does not function as a wildlife corridor/habitat linkage. Further, the off-site improvements area is within developed areas that do not function as wildlife corridor/habitat linkage. Thus, the project would not result in a permanent direct impacts to a wildlife corridor/habitat linkage (Threshold Bio-4).

5.6.2 Indirect Impacts

Long-term indirect impacts to wildlife movement would primarily be from development-related lighting. There would be no long-term indirect impacts to wildlife movement from the off-site improvements area. EPF BIO-9 (operations nighttime lighting) requires the use of shielded low-sodium, low-wattage lighting on all proposed building and accent lighting and to direct light away from sensitive biological resources. Thus, this potential long-term indirect impact to wildlife movement would be less than significant with implementation of EPF BIO-9 (Threshold Bio-4).

5.7 Impacts to Regional Resource Planning

Assessing impacts to regional resource planning takes into consideration whether the project is in conflict with the requirements of an adopted plan, an associated subarea plan, or other regional resource planning effort. As described in Section 2.4, the study area and off-site improvements area are within the City of Del Mar and the City is listed as a jurisdictional entity within the boundaries of the MSCP for the County of San Diego (1998). The City is in the process of developing an MSCP Subarea Plan, but no draft has been circulated to the public.

While no draft is available, it can be assumed that the project would not conflict with a potential subarea plan because no native habitat or others special-status biological resources would be directly impacted by the project. Additionally, the existing regulations and EPFs would minimize any potential indirect impacts to species that are covered in the MSCP or that would be addressed in the City's subarea plan. Therefore, the project does not conflict with the MSCP.

Additionally, because the project is located in the coastal zone, as defined by the CCC, it is anticipated that compliance with the California Coastal Act would be through the City's approved LCP (City of Del Mar 1993). The Del Mar Beach Resort Specific Plan, which is being prepared concurrent with this document, provides a comprehensive analysis of the project with the City's LCP. As documented in the specific plan, the proposed project is consistent with the City's approved LCP.

Therefore, the proposed project does not conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan (Threshold Bio-6).

6 EXISTING REGULATIONS AND ENVIRONMENTAL PROTECTION FEATURES

This section describes the existing regulations and EPFs that would be required to avoid and minimize impacts to special-status biological resources to a level that is less than significant pursuant to CEQA.

6.1 Compliance with Existing Regulations

There are many existing regulations that avoid and minimize potentially significant impacts to special-status biological resources. Compliance with these existing regulations avoids, minimizes, and reduces certain potential impacts to less-than-significant levels. Direct and indirect impacts to special-status biological resources will be avoided and minimized through compliance with the following existing regulations (ERs).

6.1.1 City of Del Mar Municipal Code

The proposed project is located in the City's Coastal Bluff Overlay Zone, and the City's Municipal Code has several requirements that would avoid and minimize potential significant impacts to special-status biological resources.

ER BIO-1 **Water Quality Controls During Construction**: All projects involving grading are required to prepare an erosion and sedimentation control plan. Additionally, no grading shall occur during the rainy season (November 15 to March 31) and all graded slopes shall be stabilized prior to November 15, through vegetation erosion control.

ER BIO-2 **Coastal Bluff Setback:** All new structures, including new supporting foundations or supports for existing structures, shall be set back a minimum of 40 feet from the top edge of the coastal bluff and no grading shall be allowed within 40 feet of the top edge of a coastal bluff. Setbacks would be the greater of 40 feet; or in accordance with the factor of safety as recommended by the geotechnical engineers.

ER BIO-3 **Landscape Plans**: The project is required to submit a detailed landscape plan that ensures that native and other drought-tolerant plant species will be utilized in a manner that will minimize irrigation requirements and reduce the potential of slide hazards due to over watering of the bluffs. The landscape plan will ensure that no new irrigation systems will be installed within 40 feet of the edge of the site's coastal bluff top and that any existing irrigation systems located within these bluff top setback will be removed as part of project implementation. Setbacks shall be the greater of 40 feet; or in accordance with the factor of safety as recommended by the geotechnical engineers.

ER BIO-4 **Drainage Plans:** All designs and plans for drainage improvements shall be prepared by a licensed civil engineer and shall be subject to the review and approval of the City Engineer. The plans shall include the provision of drainage facilities to convey all drainage away from any coastal bluff face and, where available, into existing developed storm drain systems capable of handling all anticipated drainage flows associated with the proposed project. Where an existing storm drain system is not available, the plan shall provide that drainage will be conveyed to a clearly defined, legal natural drainage course which can be shown to have adequate capacity to handle all required drainage flows without adverse impact to coastal bluffs.

ER BIO-5 **Polluted Runoff Control Plan**: The proposed project would be required to submit a polluted runoff control plan. The required plan shall incorporate the use of structural and non-structural Best Management Practices (BMPs), to minimize the discharge of pollutants carried by runoff from urban development into surface water drainage, and to maintain post-development peak runoff rate and average volume at levels similar to pre-development levels. Post-construction structural BMPs (or suites of BMPs) should be designed to treat, infiltrate or filter storm water runoff from each storm. The plan shall include a monitoring component to ensure long-term maintenance of BMPs as relevant, and to allow for continued evaluation of the effectiveness of the polluted runoff control plan to protect and enhance sensitive resources.

ER BIO-6 **Stormwater Management and Discharge Controls:** Stormwater will be controlled and managed in accordance with the City's Municipal Code. For example, the City's Municipal Code: (1) establishes minimum requirements for storm water management, including source control requirements, to prevent and reduce pollution; (2) establishes requirements for low impact development site design, source controls, and pollution controls, to reduce storm water pollution and erosion; (3) establishes requirements for the management of storm water flows from development projects, both to prevent erosion and to protect and enhance existing water-dependent habitats; (4) establishes standards for the use of off-site facilities for storm water management to supplement on-site practices at new development sites; and (5) establishes notice procedures and standards for adjusting storm water and non-storm water management requirements where necessary.

ER BIO-7 **Construction Noise Restrictions:** All construction activities must comply with the City's Municipal Code which does not allow construction on Sundays or City

holidays, restricts construction on Saturdays between the hours of 9:00 a.m. and 7:00 p.m., restricts construction work Monday through Friday between the hours of 7:00 a.m. and 7:00 p.m., and requires that construction activity shall not cause an hourly average sound level greater than 75 decibels on property zoned or used for residential purposes.

ER BIO-8 **Tree Removal Permit:** The project proponent shall comply with the requirements of Del Mar Municipal Code (DMMC) Section 23.50, Trees. Prior to the issuance of construction permits, the project proponent shall submit a Tree Removal Permit application to the City of Del Mar with the appropriate processing fee according to the DMMC Section 23.50.080. A Tree Removal Permit, as recommended by the Design Review Board and approved by the Del Mar City Council, would be required to cut down, remove, destroy, or move a protected tree. The project applicant shall be required to comply with the requirements of the Tree Removal Permit, which would include replanting of the protected trees on site or payment of a fee to the City of Del Mar's Tree Mitigation Fund in accordance with DMMC Sections 23.50.080(C-10), 23.50.030(D)(2), and 23.50.090(A)(2).

6.1.2 Other Regulations

ER BIO-9 **Dust Control:** The construction contractor(s) shall comply with the San Diego Air Pollution Control District Rule 55 (Fugitive Dust), which would avoid and minimize impacts to special-status biological resources from fugitive dust by requiring dust control measures to be implemented during construction.

ER BIO-10 **SWPPP:** Additionally, the applicant is required to prepare a Stormwater Pollution Prevention Plan (SWPPP) to prevent all construction pollutants from contacting stormwater, with the intent of keeping sedimentation or any other pollutants from moving off site and into receiving waters.

ER BIO-11 **Pest Control Regulations:** All uses of such compounds will comply with the application restrictions mandated by the U.S. Environmental Protection Agency (EPA) and the California Department of Pesticide Regulation.

ER BIO-12 **Preconstruction Assessment and Regulatory Permits:** Prior to the start of construction, the impact area would be assessed for jurisdictional resources, and jurisdictional waters within 50 feet of construction activities would be flagged for avoidance. If it is determined that impacts cannot be avoided, the project

proponent shall provide evidence that all required regulatory permits, such as those required under Sections 404 and 401 of the federal Clean Water Act, Section 1600 of the California Fish and Game Code, and the Porter–Cologne Water Quality Control Act, have been obtained.

6.2 Environmental Protection Features

The following EPFs would avoid and minimize potential significant indirect impacts to special-status biological resources.

EPF BIO-1 **Restoration of Bluff Scrub**: Before starting initial grading/earth-moving activities, a detailed southern coastal bluff scrub restoration plan shall be submitted to and subject to the approval of the City of Del Mar. For this EPF, restoration can include enhancement of existing southern coastal bluff scrub or creation of southern coastal bluff scrub in areas where the community is not present. The detailed southern coastal bluff scrub restoration plan shall specify, at a minimum, the following: (1) the location of the restoration site; (2) site preparation, including soils preparation and irrigation installation; (3) the quantity (seed or nursery stock) and species of plants to be planted (species are to be native to the region and consist of southern coastal bluff scrub species); (4) methods for the removal of non-native plants; (5) a schedule and action plan to maintain and monitor the restoration area; (6) a list of criteria to measure the success of the restoration site (e.g., percent cover and richness of native species, percent survivorship, establishment of self-sustaining native of plantings, maximum allowable percent of non-native species); (7) measures to exclude unauthorized entry into the restoration areas; and (8) contingency measures in the event that restoration efforts are not successful. At least 0.27 acres of southern coastal bluff scrub restoration must be successful to mitigate for the proposed impacts to southern coastal bluff scrub and to meet the success criteria of the restoration plan.

EPF BIO-2 **Demarcation of Bluff Scrub**: Before starting initial grading/earth-movement activities, the southern coastal bluff scrub to be avoided immediately adjacent to the work limits shall be marked with temporary fencing or other appropriate markers clearly visible to construction personnel. No construction access, parking, or storage of equipment or materials will be permitted within 20 feet of such marked areas.

EPF BIO-3 **Nesting Bird Surveys:** To avoid direct effects to nesting raptors and songbirds, construction related to the proposed project shall be phased to avoid the migratory bird nesting season (typically February 15 through September 1). If construction must occur during the migratory bird nesting season, a focused avian nesting

survey shall be performed in the Plan Area, within 300 feet of the proposed construction, and by a qualified biologist no more than 72 hours prior to the start of construction. If an active bird nest is found, the nest will be flagged and mapped on the construction plans along with an appropriate buffer, which will be determined by the biologist based on the biology of the species. The nest and buffer area shall be avoided until the nest is vacated and the juveniles have fledged or the nest is otherwise no longer active. The nest and buffer area shall be demarcated in the field with flagging and stakes or construction fencing. Construction shall be permitted in areas outside of the nest and buffer area. If nesting birds are present on site, a biological monitor shall be present daily during construction activities while the nest(s) is active to ensure that no effects to nesting birds occur.

EPF BIO-4 **Construction Nighttime Lighting:** Construction within 50 feet of the adjacent North Bluff Preserve area will be prohibited between sunset and sunrise, and all construction-related lighting will be turned off during that period. The location of the North Bluff Preserve area will be shown on construction documents.

EPF BIO-5 **Contractor Education Program:** A contractor education program shall be prepared and implemented to apprise all construction personnel and subcontractors of environmental restrictions. The applicant and contractor shall establish a protocol for communicating problems or potential construction changes that may affect biological resources. Workers shall be made aware of protected habitat adjacent to the Plan Area. The sensitivity of the habitat to human activities and the roles and authority of monitoring biologists shall be discussed.

EPF BIO-6 **Equipment Restrictions:** Staging and storage areas for spoils, equipment, materials, fuels, lubricants, and solvents will be located within the designated impact area. Stationary equipment, such as motors, pumps, generators, compressors, and welders located adjacent to southern coastal bluff scrub shall be positioned over drip-pans or other containment. Before refueling and lubrication, vehicles and other equipment shall be moved away from the southern coastal bluff scrub.

EPF BIO-7 **Restrictions on Use of Invasive Species:** Landscape plants will not include invasive plant species, as identified by the most recent version of the California Invasive Plant Inventory for the region, as published by the California Invasive Plant Council. Landscape plans will include a plant palette composed of native or non-native, non-invasive species that do not require high irrigation rates.

EPF BIO-8 **Signage and Fencing:** Trail fencing shall be installed to prevent unmanaged access to the adjacent North Bluff Preserve area. Access to the beach will be accommodated on existing trails in the preserve. Signage shall be included near access points that identify sensitive habitats and the importance of staying on designated trails/paths.

EPF BIO-9 **Operations Nighttime Lighting:** To reduce long-term nighttime lighting effects, shielded low-sodium, low-wattage lighting on all proposed building and accent lighting will be used to cut glare and light scatter, and to direct light away from sensitive biological resources.

EPF BIO-10 **Restoration Plan:** Should restoration be conducted as described in the Specific Plan Initiative, a Restoration Plan shall be prepared and approved by the City of Del Mar prior to implementation. The Restoration Plan will include plant palettes with native plant species consistent with surrounding habitat.

6.3 Level of Significance after Mitigation

Compliance with existing regulations and implementation of EPFs included in Sections 6.1 and 6.2 of this report would reduce potentially significant biological resource impacts resulting from implementation of the proposed project to less than significant.

7 REFERENCES

14 CCR 15000–15387 and Appendices A–L. Guidelines for Implementation of the California Environmental Quality Act, as amended.

16 U.S.C. 703–712. Migratory Bird Treaty Act, as amended.

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APPENDIX A

Plant Compendium

APPENDIX A
Plant Compendium

VASCULAR SPECIES

GYMNOSPERMS AND GNETOPHYTES

CUPRESSACEAE—CYPRESS FAMILY

Hesperocyparis macrocarpa—Monterey cypress

PINACEAE—PINE FAMILY

Pinus torreyana ssp. *torreyana*—Torrey pine

MONOCOTS

ALOACEAE—ALOE FAMILY

* *Aloe variegata*—tiger aloe

AGAVACEAE—AGAVE FAMILY

Yucca schidigera—Mojave yucca

* *Agave attenuata*—Salm-Dyck agave

ARECACEAE—PALM FAMILY

* *Phoenix canariensis*—Canary Island date palm

* *Washingtonia robusta*—Washington fan palm

ASPARAGACEAE—ASPARAGUS FAMILY

* *Asparagus asparagoides*—African asparagus fern

POACEAE—GRASS FAMILY

* *Avena barbata*—slender oat

* *Arundo donax*—giant reed

* *Bromus diandrus*—ripgut brome

* *Bromus madritensis* ssp. *rubens*—red brome

* *Cynodon dactylon*—Bermudagrass

* *Festuca myuros*—rat-tail fescue

* *Polypogon monspeliensis*—annual rabbitsfoot grass

* *Schismus barbatus*—common Mediterranean grass

Distichlis spicata—salt grass

EUDICOTS

AIZOACEAE—FIG-MARIGOLD FAMILY

* *Aptenia cordifolia*—heartleaf iceplant

* *Carpobrotus chilensis*—sea fig
* *Delosperma litorale*—seaside delosperma
* *Drosanthemum floribundum*—showy dewflower
* *Malephora crocea*—coppery mesemb
* *Mesembryanthemum crystallinum*—common iceplant
* *Mesembryanthemum nodiflorum*—slenderleaf iceplant
* *Tetragonia tetragonoides*—New Zealand spinach
* *Carpobrotus edulis*—ice plant

ANACARDIACEAE—SUMAC OR CASHEW FAMILY

* *Schinus terebinthifolius*—Brazilian peppertree
Rhus integrifolia—lemonade berry

ARALIACEAE—GINSENG FAMILY

* *Hedera canariensis*—Algerian ivy

ASTERACEAE—SUNFLOWER FAMILY

Chaenactis glabriuscula var. *glabriuscula*—yellow pincushion
Erigeron canadensis—Canadian horseweed
Isocoma menziesii var. *menziesii*—Menzies' goldenbush
Pseudognaphalium biolettii—two-color rabbit-tobacco
Stephanomeria virgata—rod wirelettuce
* *Centaurea melitensis*—Maltese star-thistle
* *Glebionis coronaria*—crowndaisy
* *Hedypnois rhagadioloides*—crete weed
Encelia californica—California brittle bush
Artemisia californica—California sagebrush
Ambrosia psilostachya—western ragweed

BRASSICACEAE—MUSTARD FAMILY

* *Brassica tournefortii*—Asian mustard
* *Cakile maritima*—European searocket
* *Lobularia maritima*—sweet alyssum

CACTACEAE—CACTUS FAMILY

Cylindropuntia prolifera—coastal cholla
Mammillaria dioica—strawberry cactus
Opuntia oricola—chaparral pricklypear
Opuntia ×occidentalis—pricklypear
Opuntia littoralis—coast prickly pear

CAPRIFOLIACEAE—HONEYSUCKLE FAMILY

* *Lonicera japonica*—Japanese honeysuckle

CHENOPODIACEAE—GOOSEFOOT FAMILY

Atriplex canescens—fourwing saltbush
* *Atriplex semibaccata*—Australian saltbush
* *Chenopodium murale*—nettleleaf goosefoot
* *Dysphania ambrosioides*—Mexican tea
* *Salsola australis*—Russian thistle
Atriplex lentiformis—quailbush

CLEOMACEAE—CLEOME FAMILY

Peritoma arborea var. *arborea*—bladderpod spiderflower

CONVOLVULACEAE—MORNING-GLORY FAMILY

* *Ipomoea purpurea*—tall morning-glory

CRASSULACEAE—STONECROP FAMILY

Dudleya edulis—fingertips
* *Crassula ovata*—jade plant

CUCURBITACEAE—GOURD FAMILY

Marah macrocarpa—Cucamonga manroot

EUPHORBIACEAE—SPURGE FAMILY

Euphorbia polycarpa—smallseed sandmat
* *Euphorbia peplus*—petty spurge

FABACEAE—LEGUME FAMILY

Acmispon glaber var. *glaber*—common deerweed
Astragalus trichopodus—Santa Barbara milkvetch

FRANKENIACEAE—FRANKENIA FAMILY

Frankenia salina—alkali heath

GERANIACEAE—GERANIUM FAMILY

* *Erodium cicutarium*—redstem stork's bill
* *Pelargonium peltatum*—ivyleaf geranium

LAMIACEAE—MINT FAMILY

Salvia clevelandii—fragrant sage

MYRSINACEAE—MYRSINE FAMILY

* *Lysimachia arvensis*—scarlet pimpernel

NYCTAGINACEAE—FOUR O'CLOCK FAMILY

Abronia umbellata var. *umbellata*—pink sand verbena

Mirabilis laevis var. *crassifolia*—California four o'clock

ONAGRACEAE—EVENING PRIMROSE FAMILY

Camissoniopsis bistorta—southern suncup

Camissoniopsis cheiranthifolia ssp. *suffruticosa*—beach suncup

PITTOSPORACEAE—PITTOSPORUM FAMILY

* *Pittosporum tobira*—Japanese cheesewood

PLUMBAGINACEAE—LEADWORT FAMILY

* *Limonium perezii*—Perez's sea lavender

* *Limonium sinuatum*—wavyleaf sea lavender

POLYGONACEAE—BUCKWHEAT FAMILY

Eriogonum parvifolium—seacliff buckwheat

Eriogonum fasciculatum var. *fasciculatum*—California buckwheat

SCROPHULARIACEAE—FIGWORT FAMILY

* *Myoporum laetum*—myoporum

SOLANACEAE—NIGHTSHADE FAMILY

Datura wrightii—sacred thorn-apple

Nicotiana clevelandii—Cleveland's tobacco

Solanum douglasii—greenspot nightshade

* *Nicotiana glauca*—tree tobacco

Lycium californicum—California box-thorn

VERBENACEAE—VERVAIN FAMILY

* *Lantana camara*—lantana

* signifies introduced (non-native) species

APPENDIX B

Wildlife Compendium

APPENDIX B
Wildlife Compendium

BIRD

BLACKBIRDS, ORIOLES AND ALLIES

ICTERIDAE—BLACKBIRDS

Icterus cucullatus—hooded oriole

BUSHTITS

AEGITHALIDAE—LONG-TAILED TITS AND BUSHTITS

Psaltriparus minimus—bushtit

FINCHES

FRINGILLIDAE—FRINGILLINE AND CARDUELINE FINCHES AND ALLIES

Haemorhous mexicanus—house finch

Spinus psaltria—lesser goldfinch

FLYCATCHERS

TYRANNIDAE—TYRANT FLYCATCHERS

Empidonax difficilis—Pacific-slope flycatcher

Myiarchus cinerascens—ash-throated flycatcher

Sayornis nigricans—black phoebe

Tyrannus vociferans—Cassin's kingbird

HAWKS

ACCIPITRIDAE—HAWKS, KITES, EAGLES, AND ALLIES

Buteo lineatus—red-shouldered hawk

HUMMINGBIRDS

TROCHILIDAE—HUMMINGBIRDS

Calypte anna—Anna's hummingbird

Selasphorus sasin—Allen's hummingbird

JAYS, MAGPIES AND CROWS

CORVIDAE—CROWS AND JAYS

Corvus brachyrhynchos—American crow

MOCKINGBIRDS AND THRASHERS

MIMIDAE—MOCKINGBIRDS AND THRASHERS

Mimus polyglottos—northern mockingbird

OLD WORLD SPARROWS

PASSERIDAE—OLD WORLD SPARROWS

* *Passer domesticus*—house sparrow

PIGEONS AND DOVES

COLUMBIDAE—PIGEONS AND DOVES

* *Streptopelia decaocto*—Eurasian collared-dove

Zenaida macroura—mourning dove

SWALLOWS

HIRUNDINIDAE—SWALLOWS

Stelgidopteryx serripennis—northern rough-winged swallow

TERNS AND GULLS

LARIDAE—GULLS, TERNS, AND SKIMMERS

Larus occidentalis—western gull

WOOD WARBLERS AND ALLIES

PARULIDAE—WOOD-WARBLERS

Oreothlypis celata—orange-crowned warbler

WRENS

TROGLODYTIDAE—WRENS

Thryomanes bewickii—Bewick's wren

WRENTITS

TIMALIIDAE—BABBLERS

Chamaea fasciata—wrentit

NEW WORLD SPARROWS

PASSERELLIDAE—NEW WORLD SPARROWS

Melozone crissalis—California towhee

MAMMAL

SQUIRRELS

SCIURIDAE—SQUIRRELS

Spermophilus (Otospermophilus) beecheyi—California ground squirrel

REPTILE

LIZARDS

PHRYNOSOMATIDAE—IGUANID LIZARDS

Sceloporus occidentalis—western fence lizard

Uta stanburiana—common side-blotched lizard

* signifies introduced (non-native) species

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APPENDIX C

Special-Status Plants Not Expected to Occur

APPENDIX C
Special-Status Plants Not Expected To Occur

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Ambrosia monogyra	singlewhorl burrobrush	None/None/2B.2	Chaparral, Sonoran desert scrub; sandy/perennial shrub/Aug–Nov/33–1640	Not expected to occur. No suitable vegetation present.
Arctostaphylos glandulosa ssp. *crassifolia*	Del Mar manzanita	FE/None/1B.1	Chaparral (maritime, sandy)/perennial evergreen shrub/Dec–June/0–1198	Not expected to occur. No suitable vegetation present.
Atriplex parishii	Parish's brittlescale	None/None/1B.1	Chenopod scrub, playas, vernal pools; alkaline/annual herb/June–Oct/82–6234	Not expected to occur. No suitable vegetation present.
Baccharis vanessae	Encinitas baccharis	FT/CE/1B.1	Chaparral (maritime), cismontane woodland; sandstone/perennial deciduous shrub/Aug–Nov/197–2362	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.
Bloomeria clevelandii	San Diego goldenstar	None/None/1B.1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; clay/perennial bulbiferous herb/Apr–May/164–1526	Not expected to occur. The study area is outside of the species' known elevation range.
Brodiaea orcuttii	Orcutt's brodiaea	None/None/1B.1	Closed-cone coniferous forest, chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, vernal pools; mesic, clay, sometimes serpentinite/perennial bulbiferous herb/May–July/98–5551	Not expected to occur. No suitable vegetation present.
Calochortus dunnii	Dunn's mariposa lily	None/CR/1B.2	Closed-cone coniferous forest, chaparral, valley and foothill grassland; gabbroic or metavolcanic, rocky/perennial bulbiferous herb/(Feb) Apr–June/607–6004	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.
Ceanothus cyaneus	Lakeside ceanothus	None/None/1B.2	Closed-cone coniferous forest, chaparral/perennial evergreen shrub/Apr–June/771–2477	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.
Ceanothus otayensis	Otay Mountain ceanothus	None/None/1B.2	Chaparral (metavolcanic or gabbroic)/perennial evergreen shrub/Jan–Apr/1969–3609	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.
Ceanothus verrucosus	wart-stemmed ceanothus	None/None/2B.2	Chaparral/perennial evergreen shrub/Dec–May/3–1247	Not expected to occur. No suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Centromadia parryi ssp. *australis*	southern tarplant	None/None/1B.1	Marshes and swamps (margins), valley and foothill grassland (vernally mesic), vernal pools/annual herb/May–Nov/0–1575	Not expected to occur. No suitable vegetation present.
Centromadia pungens ssp. *laevis*	smooth tarplant	None/None/1B.1	Chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grassland; alkaline/annual herb/Apr–Sep/0–2100	Not expected to occur. No suitable vegetation present.
Chloropyron maritimum ssp. *maritimum*	salt marsh bird's-beak	FE/CE/1B.2	Coastal dunes, marshes and swamps (coastal salt)/annual herb (hemiparasitic)/May–Oct/0–98	Not expected to occur. No suitable vegetation present.
Clarkia delicata	delicate clarkia	None/None/1B.2	Chaparral, cismontane woodland; often gabbroic/annual herb/Apr–June/771–3281	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.
Comarostaphylis diversifolia ssp. *diversifolia*	summer holly	None/None/1B.2	Chaparral, cismontane woodland/perennial evergreen shrub/Apr–June/98–2592	Not expected to occur. No suitable vegetation present.
Eryngium aristulatum var. *parishii*	San Diego button-celery	FE/CE/1B.1	Coastal scrub, valley and foothill grassland, vernal pools; mesic/annual / perennial herb/Apr–June/66–2034	Not expected to occur due to lack of suitable habitat.
Frankenia palmeri	Palmer's frankenia	None/None/2B.1	Coastal dunes, marshes and swamps (coastal salt), playas/perennial herb/May–July/0–33	Not expected to occur. No suitable vegetation present.
Grindelia hallii	San Diego gumplant	None/None/1B.2	Chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland/perennial herb/May–Oct/607–5725	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.
Hazardia orcuttii	Orcutt's hazardia	None/CT/1B.1	Chaparral (maritime), coastal scrub; often clay/perennial evergreen shrub/Aug–Oct/262–279	Not expected to occur. The study area is outside of the species' known elevation range.
Horkelia truncata	Ramona horkelia	None/None/1B.3	Chaparral, cismontane woodland; clay, gabbroic/perennial herb/May–June/1312–4265	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.
Iva hayesiana	San Diego marsh-elder	None/None/2B.2	Marshes and swamps, playas/perennial herb/Apr–Oct/33–1640	Not expected to occur. No suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	None/None/1B.1	Marshes and swamps (coastal salt), playas, vernal pools/annual herb/Feb–June/3–4003	Not expected to occur. No suitable vegetation present.
Lepechinia cardiophylla	heart-leaved pitcher sage	None/None/1B.2	Closed-cone coniferous forest, chaparral, cismontane woodland/perennial shrub/Apr–July/1706–4495	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.
Monardella hypoleuca ssp. *lanata*	felt-leaved monardella	None/None/1B.2	Chaparral, cismontane woodland/perennial rhizomatous herb/June–Aug/984–5167	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.
Monardella viminea	willowy monardella	FE/CE/1B.1	Chaparral, coastal scrub, riparian forest, riparian scrub, riparian woodland; alluvial ephemeral washes/perennial herb/June–Aug/164–738	Not expected to occur. The study area is outside of the species' known elevation range.
Navarretia fossalis	spreading navarretia	FT/None/1B.1	Chenopod scrub, marshes and swamps (assorted shallow freshwater), playas, vernal pools/annual herb/Apr–June/98–2149	Not expected to occur. No suitable vegetation present.
Nemacaulis denudata var. *denudata*	coast woolly-heads	None/None/1B.2	Coastal dunes/annual herb/Apr–Sep/0–328	Not expected to occur. No suitable vegetation present.
Orcuttia californica	California Orcutt grass	FE/CE/1B.1	Vernal pools/annual herb/Apr–Aug/49–2165	Not expected to occur. No suitable vegetation present.
Pinus torreyana ssp. *torreyana*	Torrey pine	None/None/1B.2	Closed-cone coniferous forest, chaparral; sandstone/perennial evergreen tree/N.A./98–525	Not expected to occur naturally. The species has been observed on study area, but the trees were planted on the study area. No suitable vegetation present.
Pogogyne abramsii	San Diego mesa mint	FE/CE/1B.1	Vernal pools/annual herb/Mar–July/295–656	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.
Pogogyne nudiuscula	Otay Mesa mint	FE/CE/1B.1	Vernal pools/annual herb/May–July/295–820	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Salvia munzii	Munz's sage	None/None/2B.2	Chaparral, coastal scrub/perennial evergreen shrub/Feb–Apr/377–3494	Not expected to occur. The study area is outside of the species' known elevation range.
Sphaerocarpos drewei	bottle liverwort	None/None/1B.1	Chaparral, coastal scrub; openings, soil/ephemeral liverwort/N.A./295–1969	Not expected to occur. The study area is outside of the species' known elevation range.
Stemodia durantifolia	purple stemodia	None/None/2B.1	Sonoran desert scrub (often mesic, sandy)/perennial herb/Jan–Dec/591–984	Not expected to occur. The study area is outside of the species' known elevation range and there is no suitable vegetation present.
Stylocline citroleum	oil neststraw	None/None/1B.1	Chenopod scrub, coastal scrub, valley and foothill grassland; clay/annual herb/Mar–Apr/164–1312	Not expected to occur. The study area is outside of the species' known elevation range.
Suaeda esteroa	estuary seablite	None/None/1B.2	Marshes and swamps (coastal salt)/perennial herb/May–Oct (Jan)/0–16	Not expected to occur. No suitable vegetation present.

Status Legend

FE: Federally listed as endangered
FT: Federally listed as threatened
CE: State listed as endangered
CR: State listed as rare
CT: State listed as threatened

CRPR

1B: Plants rare, threatened, or endangered in California and elsewhere
2B: Plants rare, threatened, or endangered in California, but more common elsewhere
3: Plants about which more information is needed – a review list

Threat Rank

.1 – Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 – Fairly threatened in California (20%–80% occurrences threatened/moderate degree and immediacy of threat)
.3 – Not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

APPENDIX D

Special-Status Wildlife Species Analysis of Potential to Occur in the Study Area

APPENDIX D
Special-Status Wildlife Species Analysis of Potential to Occur in the Study Area

Scientific Name	Common Name	Status (Federal/ State)	Primary Habitat Associations	Verified within the Study Area (Direct/ Indirect Evidence)	Status Within the Study Area or Potential to Occur
			Amphibians		
Spea hammondii	western spadefoot	None/SSC	Primarily grassland and vernal pools, but also in ephemeral wetlands that persist at least 3 weeks in chaparral, coastal scrub, valley–foothill woodlands, pastures, and other agriculture	N	Not expected to occur. No vernal pools or ephemeral basins were observed within the study area. The site is highly disturbed (mowing and development) and the areas of native vegetation are on steep slopes which would not support ponding.
			Reptiles		
Actinemys marmorata	western pond turtle	None/SSC	Slow- moving permanent or intermittent streams, ponds, small lakes, and reservoirs with emergent basking sites; adjacent uplands used for nesting and during winter	N	Not expected to occur. There are no areas of suitable habitat for this species within the study area.
Arizona elegans occidentalis	California glossy snake	None/SSC	Commonly occurs in desert regions throughout southern California. Prefers open sandy areas with scattered brush. Also found in rocky areas.	N	Not expected to occur. No suitable habitat present within the study area.
Aspidoscelis tigris stejnegeri	San Diegan tiger whiptail	None/SSC	Hot and dry areas with sparse foliage, including chaparral, woodland, and riparian areas.	N	Low potential to occur. While there is some suitable habitat within the vegetated bluffs in the study area, the area is completely surrounded by development, the ocean or the beach. The available habitat is very isolated and would likely not support a sustainable population of this species.
Crotalus ruber	red diamondback rattlesnake	None/SSC	Coastal scrub, chaparral, oak and pine woodlands, rocky grasslands, cultivated areas, and desert flats	N	Low potential to occur. While there is some suitable habitat within the vegetated bluffs in the study area, the area is completely surrounded by

Scientific Name	Common Name	Status (Federal/ State)	Primary Habitat Associations	Verified within the Study Area (Direct/ Indirect Evidence)	Status Within the Study Area or Potential to Occur
					development, the ocean or the beach. The available habitat is very isolated and would likely not support a sustainable population of this species.
Phrynosoma blainvillii	Blainville's horned lizard	None/SSC	Open areas of sandy soil in valleys, foothills, and semi-arid mountains including coastal scrub, chaparral, valley–foothill hardwood, conifer, riparian, pine–cypress, juniper, and annual grassland habitats	N	Not expected to occur. The study area does not support suitable habitat for this species.
Salvadora hexalepis virgultea	coast patch-nosed snake	None/SSC	Brushy or shrubby vegetation; requires small mammal burrows for refuge and overwintering sites	N	Low potential to occur. While there is some suitable habitat within the vegetated bluffs in the study area, the area is completely surrounded by development, the ocean or the beach. The available habitat is very isolated and would likely not support a sustainable population of this species.
Thamnophis hammondii	two-striped gartersnake	None/SSC	Streams, creeks, pools, streams with rocky beds, ponds, lakes, vernal pools	N	Not expected to occur. The study area does not support suitable habitat for this species.
Birds					
Agelaius tricolor (nesting colony)	tricolored blackbird	BCC/PSE, SSC	Nests near freshwater, emergent wetland with cattails or tules, but also in Himalayan blackberrry; forages in grasslands, woodland, and agriculture	N	Not expected to occur. The study area does not support suitable habitat for this species.

Scientific Name	Common Name	Status (Federal/ State)	Primary Habitat Associations	Verified within the Study Area (Direct/ Indirect Evidence)	Status Within the Study Area or Potential to Occur
Artemisiospiza belli belli	Bell's sage sparrow	BCC/WL	Nests and forages in coastal scrub and dry chaparral; typically in large, unfragmented patches dominated by chamise; nests in more dense patches but uses more open habitat in winter	N	Not expected to occur. The study area does not support suitable habitat for this species.
Athene cunicularia (burrow sites and some wintering sites)	burrowing owl	BCC/SSC	Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows	N	Not expected to occur. The study area does not support suitable habitat for this species. While there are open areas with ground squirrel burrows, it is a small isolated patch and is not likely to support a sustainable population of this species. In addition, this species was not observed during study area visits.
Buteo swainsoni (nesting)	Swainson's hawk	BCC/ST	Nests in open woodland and savanna, riparian, and in isolated large trees; forages in nearby grasslands and agricultural areas such as wheat and alfalfa fields and pasture	N	Not expected to occur. The study area does not support suitable habitat for this species.
Campylorhynchus brunneicapillus sandiegensis (San Diego and Orange Counties only)	coastal cactus wren	BCC/SSC	Southern cactus scrub patches	N	Not expected to occur. The study area does not support suitable habitat for this species. There are a few very small cactus patches (1-2 plants) along the bluffs; however they are isolated and not likely to support a sustainable population of this species
Charadrius alexandrinus nivosus (nesting)	western snowy plover	FT, BCC/SSC	On coasts nests on sandy marine and estuarine shores; in the interior nests on sandy, barren or sparsely vegetated flats near saline or alkaline lakes, reservoirs, and ponds	N	Not expected to occur. The study area supports a small amount of suitable beach habitat for this species. However, the North Bluff Preserve is a highly utilized beach that allows for off-leash dog use. Due to the high level of human disturbance and the small amount of suitable

Scientific Name	Common Name	Status (Federal/ State)	Primary Habitat Associations	Verified within the Study Area (Direct/ Indirect Evidence)	Status Within the Study Area or Potential to Occur
					habitat in the study area, this species is not expected to occur.
Coccyzus americanus occidentalis (nesting)	western yellow-billed cuckoo	FT, BCC/SE	Nests in dense, wide riparian woodlands and forest with well-developed understories	N	Not expected to occur. The study area is outside of the species' known geographic range.
Elanus leucurus (nesting)	white-tailed kite	None/FP	Nests in woodland, riparian, and individual trees near open lands; forages opportunistically in grassland, meadows, scrubs, agriculture, emergent wetland, savanna, and disturbed lands	N	Not expected to occur. The study area does not support suitable habitat for this species.
Empidonax traillii extimus (nesting)	southwestern willow flycatcher	FE/SE	Nests in dense riparian habitats along streams, reservoirs, or wetlands; uses variety of riparian and shrubland habitats during migration	N	Not expected to occur. The study area does not support suitable habitat for this species.
Falco mexicanus (nesting)	prairie falcon	BCC/WL	Forages in grassland, savanna, rangeland, agriculture, desert scrub, alpine meadows; nest on cliffs or bluffs	N	Not expected to occur. The study area does not support suitable habitat for this species.
Icteria virens (nesting)	yellow-breasted chat	None/SSC	Nests and forages in dense, relatively wide riparian woodlands and thickets of willows, vine tangles, and dense brush	N	Not expected to occur. The study area does not support suitable habitat for this species.
Ixobrychus exilis (nesting)	least bittern	BCC/SSC	Nests in freshwater and brackish marshes with dense, tall growth of aquatic and semi-aquatic vegetation	N	Not expected to occur. The study area does not support suitable habitat for this species.
Laterallus jamaicensis coturniculus	California black rail	BCC/ST, FP	Tidal marshes, shallow freshwater margins, wet meadows, and flooded grassy vegetation; suitable habitats are often supplied by canal leakage in Sierra Nevada foothill populations	N	Not expected to occur. The study area does not support suitable habitat for this species.
Passerculus sandwichensis beldingi	Belding's savannah sparrow	None/SE	Nests and forages in coastal saltmarsh dominated by pickleweed (Salicornia spp.)	N	Not expected to occur. The study area does not support suitable habitat for this species.

Scientific Name	Common Name	Status (Federal/ State)	Primary Habitat Associations	Verified within the Study Area (Direct/ Indirect Evidence)	Status Within the Study Area or Potential to Occur
Polioptila californica californica	coastal California gnatcatcher	FT/SSC	Nests and forages in various sage scrub communities, often dominated by California sagebrush and buckwheat; generally avoids nesting in areas with a slope of greater than 40%; majority of nesting at less than 1,000 feet above mean sea level	N	Low potential to occur. While there is some suitable habitat within the vegetated bluffs in the study area, the area is completely surrounded by development, the ocean or the beach. The available habitat is very isolated and would likely not support a sustainable population of this species. The focused, protocol-level survey for gnatcher was negative.
Rallus obsoletus levipes	Ridgway's rail	FE/SE, FP	Coastal wetlands, brackish areas, coastal saline emergent wetlands	N	Not expected to occur. The study area does not support suitable habitat for this species.
Setophaga petechia (nesting)	yellow warbler	BCC/SSC	Nests and forages in riparian and oak woodlands, montane chaparral, open ponderosa pine, and mixed-conifer habitats	N	Not expected to occur. The study area does not support suitable habitat for this species.
Sternula antillarum browni (nesting colony)	California least tern	FE/SE, FP	Forages in shallow estuaries and lagoons; nests on sandy beaches or exposed tidal flats	N	Not expected to occur. The study area supports a small amount of suitable beach habitat for this species. However, the North Bluff Preserve is a highly utilized beach that allows for off-leash dog use. Due to the high level of human disturbance and the small amount of suitable habitat in the study area, this species is not expected to occur.
Vireo bellii pusillus (nesting)	least Bell's vireo	FE/SE	Nests and forages in low, dense riparian thickets along water or along dry parts of intermittent streams; forages in riparian and adjacent shrubland late in nesting season	N	Not expected to occur. The study area does not support suitable habitat for this species.

Scientific Name	Common Name	Status (Federal/ State)	Primary Habitat Associations	Verified within the Study Area (Direct/ Indirect Evidence)	Status Within the Study Area or Potential to Occur
			Mammals		
Antrozous pallidus	pallid bat	None/SSC	Grasslands, shrublands, woodlands, forests; most common in open, dry habitats with rocky outcrops for roosting, but also roosts in man-made structures and trees	N	Low potential to occur. While there are tree suitable for roosting, the study area and surrounding urbanized areas don't provide suitable foraging habitat for this species. The closest known occurrence of this species is approximately 15 miles northeast of the study area (CDFW 2017a).
Chaetodipus californicus femoralis	Dulzura pocket mouse	None/SSC	Open habitat, coastal scrub, chaparral, oak woodland, chamise chaparral, mixed-conifer habitats; disturbance specialist; 0 to 3,000 feet above mean sea level	N	Low potential to occur. While this species is known to occur in disturbed areas, study area is surrounded by development and water. There site lacks a connection to other areas of suitable habitat which would be required for the viability of the species. The closest known location of the species is 6 miles northeast of the study area (CDFW 2017a).
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	None/SSC	Coastal scrub, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon–juniper, and annual grassland	N	Low potential to occur. While there is a small area of suitable scrub habitat for this species, study area is surrounded by development and water. There site lacks a connection to other areas of suitable habitat which would be required for the viability of the species. The closest known location of the species is approximately 2 miles southeast of the study area (CDFW 2017a).
Choeronycteris mexicana	Mexican long-tongued bat	None/SSC	Desert and montane riparian, desert succulent scrub, desert scrub, and pinyon–juniper woodland; roosts in caves, mines, and buildings	N	Not expected to occur. The study area does not support suitable roosting or foraging habitat for this species.

Scientific Name	Common Name	Status (Federal/ State)	Primary Habitat Associations	Verified within the Study Area (Direct/ Indirect Evidence)	Status Within the Study Area or Potential to Occur
Corynorhinus townsendii	Townsend's big-eared bat	None/SSC	Mesic habitats characterized by coniferous and deciduous forests and riparian habitat, but also xeric areas; roosts in limestone caves and lava tubes, man-made structures, and tunnels	N	Not expected to occur. The study area does not support suitable roosting or foraging habitat for this species.
Euderma maculatum	spotted bat	None/SSC	Foothills, mountains, desert regions of southern California, including arid deserts, grasslands, and mixed-conifer forests; roosts in rock crevices and cliffs; feeds over water and along washes	N	Not expected to occur. The study area does not support suitable roosting or foraging habitat for this species.
Eumops perotis californicus	western mastiff bat	None/SSC	Chaparral, coastal and desert scrub, coniferous and deciduous forest and woodland; roosts in crevices in rocky canyons and cliffs where the canyon or cliff is vertical or nearly vertical, trees, and tunnels	N	Low potential to occur. While there are trees suitable for foraging habitat for the species, the study area and surrounding urbanized areas don't provide suitable roosting habitat for this species. The closest known occurrence of this species is approximately 4 miles northeast of the study area within the San Dieguito River (CDFW 2017a).
Lasiurus blossevillii	western red bat	None/SSC	Forest, woodland, riparian, mesquite bosque, and orchards, including fig, apricot, peach, pear, almond, walnut, and orange; roosts in tree canopy	N	Not expected to occur. The study area does not support suitable roosting or foraging habitat for this species.
Lasiurus xanthinus	western yellow bat	None/SSC	Valley–foothill riparian, desert riparian, desert wash, and palm oasis habitats; below 2,000 feet above mean sea level; roosts in riparian and palms	N	Not expected to occur. The study area does not support suitable roosting or foraging habitat for this species.
Lepus californicus bennettii	San Diego black-tailed jackrabbit	None/SSC	Arid habitats with open ground; grasslands, coastal scrub, agriculture, disturbed areas, and rangelands	N	Not expected to occur. While there is some suitable habitat within the study area, the area is completely surrounded by development, the ocean or the beach. The available habitat is very isolated and would likely not support a sustainable

Scientific Name	Common Name	Status (Federal/ State)	Primary Habitat Associations	Verified within the Study Area (Direct/ Indirect Evidence)	Status Within the Study Area or Potential to Occur
					population of this species.
Neotoma lepida intermedia	San Diego desert woodrat	None/SSC	Coastal scrub, desert scrub, chaparral, cacti, rocky areas	N	Low potential to occur. Although there is suitable habitat present, no woodrat middens were observed during the wildlife assessment.
Nyctinomops femorosaccus	pocketed free-tailed bat	None/SSC	Pinyon–juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oases; roosts in high cliffs or rock outcrops with drop-offs, caverns, and buildings	N	Not expected to occur. The study area does not support suitable roosting or foraging habitat for this species.
Nyctinomops macrotis	big free-tailed bat	None/SSC	Rocky areas; roosts in caves, holes in trees, buildings, and crevices on cliffs and rocky outcrops; forages over water	N	Not expected to occur. The study area does not support suitable roosting or foraging habitat for this species.
Perognathus longimembris pacificus	Pacific pocket mouse	FE/SSC	fine-grained sandy substrates in open coastal strand, coastal dunes, and river alluvium	N	Low potential to occur. While there is suitable beach habitat adjacent to the study area, this area is heavily used by people and within a largely urban setting. The closest known occurrence is 1.5 miles southeast of the study area just outside of the San Dieguito Lagoon (CDFW 2017a).
Taxidea taxus	American badger	None/SSC	Dry, open, treeless areas; grasslands, coastal scrub, agriculture, and pastures, especially with friable soils	N	Not expected to occur. While there is some suitable habitat within the study area, the area is completely surrounded by development, the ocean or the beach. The available habitat is very isolated and would likely not support a sustainable population of this species.

Scientific Name	Common Name	Status (Federal/ State)	Primary Habitat Associations	Verified within the Study Area (Direct/ Indirect Evidence)	Status Within the Study Area or Potential to Occur
			Invertebrates		
Branchinecta sandiegonensis	San Diego fairy shrimp	FE/None	Vernal pools, non-vegetated ephemeral pools	N	Not expected to occur. No vernal pools or ephemeral basins were observed within the study area. The site is highly disturbed (mowing and development) and the areas of native vegetation are on steep slopes which would not support ponding.
Euphydryas editha quino	quino checkerspot butterfly	FE/None	Annual forblands, grassland, open coastal scrub and chaparral; often soils with cryptogamic crusts and fine-textured clay; host plants include Plantago erecta, Antirrhinum coulterianum, and Plantago patagonica (Silverado Occurrence Complex)	N	Not expected to occur. There are no areas of suitable habitat for this species within the study area.
Lycaena hermes	Hermes copper	FC/None	Mixed woodlands, chaparral, and coastal scrub	N	Not expected to occur. There are no areas of suitable habitat for this species within the study area.
Streptocephalus woottoni	Riverside fairy shrimp	FE/None	Vernal pools, non-vegetated ephemeral pools	N	Not expected to occur. No vernal pools or ephemeral basins were observed within the study area. The site is highly disturbed (mowing and development) and the areas of native vegetation are on steep slopes which would not support ponding.

Status Abbreviations
BCC: U.S. Fish and Wildlife Service Bird of Conservation Concern
FC: Federal Candidate
FE: Federally Endangered
FP: California Fully Protected Species
FT: Federally Threatened
PSE: Proposed State Endangered
SE: State Endangered
SSC: California Species of Special Concern
ST: State Threatened
WL: California Watch List Species

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Appendix E

Cultural Resources Survey Report

CULTURAL RESOURCES SURVEY REPORT
for the
MARISOL PROJECT,
CITY OF DEL MAR, SAN DIEGO, CALIFORNIA

Prepared for:

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NOVEMBER 2019

Type of Study: Positive Cultural Resource Survey
USGS Quadrangle: Del Mar, CA 7.5', T14S, R4W, Sections 2, and 11 **Area:** 16.55acres,
Key Words: Positive Survey, City of Del Mar; CA-SDI-7979; CA-SDI-10940, SDM-W-34 and 34A; the "Del Mar Man Site"; Malcom Rogers

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TABLE OF CONTENTS

Section **Page No.**

MANAGEMENT SUMMARY ..... **III**

1 INTRODUCTION **7**
1.1 Project Location and Description 7
1.2 Regulatory Context 8
1.2.1 Cultural Resources Regulations 8

2 PROJECT CONTEXT **23**
2.1 Environmental Context 23
2.2 Geological Context 23
2.3 Cultural Context 24
2.3.1 Paleoindian (pre-5500 BC) 24
2.3.2 Archaic (8000 BC–AD 500) 26
2.3.3 Late Prehistoric (AD 500–1769) 26
2.3.4 Ethnohistoric (post-AD 1769) 27
2.3.5 The Historic Period (post-AD 1542) 30
2.4 Previous Cultural Resource Investigations 31
2.4.1 CA-SDI-7979 36
2.4.2 CA-SDI-10940 37
2.4.3 CA-SDI-192 38
2.5 Tribal Correspondence 38

3 SURVEY METHODS **41**

4 SURVEY RESULTS **43**
4.1 Disturbances 43
4.2 CA-SDI-7979 44
4.3 CA-SDI-10940 45

5 EXTENDED PHASE I SUBSURFACE SURVEY **47**
5.1 Extended Phase I Methodology 47

6 EXTENDED PHASE I RESULTS **49**
6.1.1 Unit Sediment Profiles 49
6.1.2 Artifact Recovery 50
6.1.3 Artifacts and Species Identified 51

7 SUMMARY AND RECOMMENDATIONS **53**
7.1 Impacts 53

8 REFERENCES **55**

TABLE OF CONTENTS (CONTINUED)

Page No.

APPENDICES

A Project Area Cultural Resources Maps (Confidential)
B SCIC Cultural Records Search Results (Confidential)
C NAHC Sacred Lands File Search and Tribal Correspondence (Confidential)
D Archival Aerial Image Research Results
E New DPR Site Forms and Updates (Confidential)

FIGURES

1 Regional Map 15
2 Vicinity Map 17
3 Area of Potential Effects 19
4 Cultural Resource Location Map ..... Confidential Appendix A
5 CA-SDI-10940 Extended Phase I Map ..... Confidential Appendix A

TABLES

1 Previous Cultural Studies conducted within the Project APE and 1-mile Record Search 31
2 Previously recorded Cultural Resources in the Project APE and 1-mile Record Search 36
3 Artifacts Recovered form SDI-10940 51

MANAGEMENT SUMMARY

This report presents the results of Dudek's cultural resources survey for the Marisol Project (Project), City of Del Mar, California. The Project is located in Township 14 South; Range 4 West; Sections 2 and 11; of the Del Mar, California USGS 7.5-minute Quadrangle. The Project area of potential effect (APE), also described as the privately owned land within the Specific Plan Area, is 16.55 acres and is located south of Border Avenue and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. The Project APE comprises eight (8) Assessor's Parcel Numbers (APN): 298-241-06, -07, -29, -34, -35, -36 and 299-030-14 and -15.

A records search conducted at the South Coastal Information Center (SCIC) by Dudek staff has indicated that two previously recorded prehistoric cultural resources are within or intersect with portions of the proposed Project APE. CA-SDI-7979, a prehistoric habitation site, is located within the northern portion of the Project APE, and CA-SDI-10940 a large prehistoric habitation site was recorded as being situated along the southern edge within the southern portion of the Project APE (Confidential Appendix B, SCIC Record Search).

Dudek archaeologists conducted an intensive cultural pedestrian survey of previously recorded site areas, visible ground surfaces, and areas of subsurface exposure. Dudek inspected all exposed ground surfaces, however low-laying vegetation allowed for approximately 50-75 percent visibility throughout the majority of the Project APE. Both of the previously recorded cultural resources were relocated, and no new resources were identified

During the pedestrian survey, cultural material and artifacts were relocated within the areas previously recorded for site CA-SDI-7979. A very sparse scatter of marine shell (principally *Chione* and *Argopecten*), lithic materials, and deflating midden sediments were observed on the highest and central portion of the terrace, near the previously recorded boundaries of CA-SDI-7979. A data recovery program was performed in 1996 by Brian F. Smith and Associates (BFSA) at CA-SDI-7979 to mitigate adverse effects (significant impacts) to the resources potentially impacted by proposed development and subsequent cultural monitoring was recommended for any following development activities (Kirkish and Smith 1997). That data recovery program and recommendation for monitoring are sufficient to mitigate impacts that result from the current Project. A low-density scatter of artifacts remains across much of the project APE; these have been redistributed from past landscaping and construction activities and are not associated with intact archaeological deposits (artifacts were identified mixed with imported fill materials).

CA-SDI-10940, also known as the "Del Mar Man Site," is a large prehistoric habitation site that was relocated in the southern part of the Project area. The site was initially recorded by Malcom Rogers in 1929 who divided this site into two Loci; W-34 located on a lower terrace closer to the water level and, W-34A, located on the upper cliff terrace. Rogers collected human remains from at least two

features during his 1929 investigations. According to the record search information, this site has been the focus of five previous cultural investigations; the initial work in 1929, then again in 1963, 1974, and then re-visited in 1988. In 1995, Dayle Cheever with RECON Environmental Inc. conducted a cultural resource significance testing project at the site and encountered cultural materials and artifacts scattered along the upper terrace, W-34A. RECON's testing established that portions of CA-SDI-10940 were still intact and in relatively undisturbed condition. In fact, the Cheever report introduced the comments that the site had at one time previously been capped with sterile dirt as a method of preservation (Cheever 1995). Cheever concluded that CA-SDI-10940 is significant under CEQA based on its data potential and that it may qualify as a unique archaeological resource "because of the destruction of many coastal archaeological sites through development and/or intensive agriculture" (Cheever 1995). Cheever recommended that a data recovery program would need to be conducted at CA-SDI-10940 to mitigate potential destruction of this resource. Following the data recovery, Native American and archaeological monitors should be present during construction grading or other ground-disturbing activities for potential projects. Finally, it was recommended that an Archaeological Resource Management Report (ARMR) technical report would need to be prepared and submitted to the City of Del Mar, for review by City staff and approved before map or permit approval (Cheever 1995).

During the current survey, cultural materials and artifacts were identified on the ground surface in the vicinity of the previously recorded site location for CA-SDI-10940 but the integrity of the portion of this site within the current Project APE is questionable due to the rather extreme level of residential development and landscape disturbance identified in the area. Dudek obtained historic aerial imagery that indicates a combination of early agricultural and then later residential activities have disturbed surface deposits from the site. However, while agricultural plowing would have initially confused the vertical integrity of the site, there remained a possibility that intact archaeological deposits remain below the disturbed surface. For this reason, Dudek completed an extended phase I (XPI) subsurface survey to determine whether intact archaeological deposits remain in the areas identified by Cheever (1995). Dudek's XPI program consisted of three 50 x 25-cm shovel test pits (STP) and several 10-cm diameter hand augers in the base of STPs or subjectively placed. These efforts resulted in the identification of an intact archaeological deposit variably contained between 20 and 60 cm below the surface in an area approximately 15 m in diameter. The archaeological deposit contained dense bay/estuarine bivalve remains, along with a few pieces of flaked lithic debris and a hammerstone. The archaeological deposit does not appear to be extensive or consistent across the approximate 15 m-diameter area bracketed by STPs. Red Tail Monitoring and Research, LLC (Red Tail) provided a tribal monitor during the XPI testing but no specific tribal concerns were relayed to Dudek during the excavation, other than the importance of properly treating the resource prior to construction.

Avoidance is the preferred treatment for cultural resources under CEQA. If avoidance is not feasible, a focused data recovery program should be implemented to mitigate significant impacts to the remnant and affected portions of CA-SDI-10940, according to the CEQA guidelines. A research design and data recovery plan should be prepared to guide data recovery, taking into account finalized construction plans and other concerns in order to better define impacted areas. The data recovery program should be completed prior to project-related earth moving in the vicinity of CA-SDI-10940.

Furthermore, conceptual off-site improvements associated with the Project include a new water main to extend into the City of Del Mar in order to find a suitable connection point. The existing water mains servicing the northernmost houses before the entrance to the lagoon are currently served by either an existing 4-inch or 6-inch water main, which would not have sufficient capacity to serve as the connection point for the new water main. Additional project impacts might be required within or adjacent to the Specific Plan Area and the cultural APE. Portions of the alignment will be located along the south side of San Dieguito Lagoon. Coastal lagoons are highly sensitive areas for archaeological sites, as most were occupied by Native Americans for most of the last 10,000 years. While there has been extensive disturbance in the area in the last 50–100 years that would have impacted such sites to varying degrees, Dudek recommends that a qualified professional archaeologist and Native American monitor should do an inspection of in the locations of the additional disturbances where earth is exposed to determine the level of effort for monitoring during the duration of the ground disturbing activities associated with the water connection.

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1 INTRODUCTION

1.1 Project Location and Description

The proposed Marisol Specific Plan Project (Project) is situated within in the City of Del Mar, San Diego County, California (Figure 1). The Specific Plan Area includes approximately 17.45 acres. The Project area of potential effect (APE) is 16.55-acres of privately owned land within the Specific Plan Area located in Township 14 South; Range 4 West; Sections 2 and 11; of the Del Mar, California USGS 7.5-minute Quadrangle (Figure 2). Eight (8) parcels (APNs 298-241-06, -07, -29, -34, -35, -36 and 299-030-14 and -15) comprise the APE for the Project (Figure 3). The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The project consists of a Specific Plan including five land use sub-designations: Visitor Serving Accommodations (VSA), Parkland/Passive Open Space (PPOS), Coastal Bluff Protection Area (CBPA) and Steep Slope Protection Area (SSPA). The VSA land use sub-designation allows for the development of approximately 65 hotel guest rooms, 31 villas (27 of which may be used as hotel guest rooms when not in use by owners, subject to provisions in the Specific Plan), 10 lower-cost shared visitor-serving accommodations, 22 affordable housing units, and associated amenities. Amenities include, but are not limited to, restaurants, bar/lounge, special event space, meeting space, swimming pools, a spa and fitness center and retail.

The PPOS land use sub-designation allows for public amenities such as trails, vista points, picnic areas, public access stairway and public restrooms, and passive recreational uses. Passive recreational uses are defined in the Specific plan as low intensity recreational activities that require little or no infrastructure and that are geared toward the viewing and appreciation of scenic and environmentally sensitive areas.

The CBPA and SSPA land use sub-designations serve as protection areas. The only disturbance allowed within the CBPA is the minimal amount necessary to install drainage control measures to protect a coastal bluff area from degradation and/or erosion. Shoreline protection devices are prohibited in this area. The only disturbance allowed within the SSPA is the minimal amount necessary to provide a public access stairway, public restrooms, and related facilities for hotel and public visitor services at the toe of slope; to implement drainage control measures to protect the steep slope area from degradation and/or erosion; and to allow interpretive signage and pathway lighting.

Off-site improvements include a new water main for the project to extend into the City of Del Mar in order to find a suitable connection point. The existing water mains servicing the northernmost houses before the entrance to the lagoon are currently served by either an existing 4-inch or 6-inch water main, which would not have sufficient capacity to serve as the connection point for the new water main. There are two alternatives for the proposed development's potable water supplied by the City of Del

Mar. Both alternatives consist of constructing a new 16-inch diameter pipeline. One alternative is to construct approximately 4,000 linear feet of new 16-inch water main in Via De La Valle from the intersection of Via De La Valle and Jimmy Durante Boulevard to Camino Del Mar within the City of Del Mar. This new 16-inch water line would connect to the existing 18-inch City of Del Mar water main at the north end of Jimmy Durante Boulevard just south of Via De La Valle. The second alternative would construct approximately 5,000 linear feet of 16-inch pipe connected to an existing 20-inch City pipeline beginning on the west side of the intersection of Jimmy Durante Boulevard and San Dieguito Drive. This pipeline would extend northwest, following the Public Works Yard paved access road, then go along the dirt access road adjacent to the Public Works Yard up to the proposed crossing of the railroad right-of-way and drainage ditch. The work to cross the railroad right-of-way and drainage ditch would be done using a jack-and-bore construction method to avoid interruption of these resources. Then the pipeline would continue west via 27th or 28th Street to Camino Del Mar, then north to Via De La Valle. This alternative would replace existing pipelines south of Sandy Lane and construct new pipelines north of Sandy Lane to Via de la Valle. All pipeline construction and replacement would occur within paved roads, City and North County Transit Department right-of-way, or the Public Works yard.

1.2 Regulatory Context

The following section provides a summary of the applicable regulations, policies and guidelines relating to the proper management of cultural resources.

1.2.1 Cultural Resources Regulations

1.2.1.1 Regulations

The California Register of Historic Resources (Public Resources Code section 5020 et seq.)

In California, the term "historical resource" includes but is not limited to "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (California Public Resources Code section 5020.1(j)). In 1992, the California legislature established CRHR "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code section 5024.1(a)). A resource is eligible for listing in the CRHR if the State Historical Resources Commission determines that it is a significant resource and that it meets any of the following National Register of Historic Places (NRHP) criteria:

1. Associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

2. Associated with the lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history.

(California Public Resources Code section 5024.1(c).) Resources less than 50 years old are not considered for listing in the CRHR, but may be considered if it can be demonstrated that sufficient time has passed to understand the historical importance of the resource (see 14 CCR, section 4852(d)(2)).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing on the NRHP are automatically listed on the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys. The State Historic Preservation Officer maintains the CRHR.

Native American Historic Cultural Sites (California Public Resources Code section 5097 et seq.)

The Native American Historic Resources Protection Act (Public Resources Code section 5097, et seq.) addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project; and establishes the NRHC to resolve disputes regarding the disposition of such remains. In addition, the Native American Historic Resource Protection Act makes it a misdemeanor punishable by up to 1 year in jail to deface or destroy an Indian historic or cultural site that is listed or may be eligible for listing in the CRHR.

California Native American Graves Protection and Repatriation Act

The California Native American Graves Protection and Repatriation Act (California Repatriation Act), enacted in 2001, requires all state agencies and museums that receive state funding and that have possession or control over collections of human remains or cultural items, as defined, to complete an inventory and summary of these remains and items on or before January 1, 2003, with certain exceptions. The California Repatriation Act also provides a process for the identification and repatriation of these items to the appropriate tribes.

California Environmental Quality Act

As described further below, the following CEQA statutes and CEQA Guidelines are relevant to the analysis of archaeological and historic resources:

1. California Public Resources Code section 21083.2(g): Defines "unique archaeological resource."
2. California Public Resources Code section 21084.1 and CEQA Guidelines section 15064.5(a): Defines historical resources. In addition, CEQA Guidelines section 15064.5(b) defines the phrase "substantial adverse change in the significance of an historical resource. It also defines the circumstances when a project would materially impair the significance of a historical resource.
3. California Public Resources Code section 5097.98 and CEQA Guidelines section 15064.5(e): These statutes sets forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
4. California Public Resources Code sections 21083.2(b)-(c) and CEQA Guidelines section 15126.4: These statutes and regulations provide information regarding the mitigation framework for archaeological and historic resources, including options of preservation-in-place mitigation measures; identifies preservation-in-place as the preferred manner of mitigating impacts to significant archaeological sites.

Under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an historical resource" (California Public Resources Code section 21084.1; CEQA Guidelines section 15064.5(b)). An "historical resource" is any site listed or eligible for listing in the CRHR. The CRHR listing criteria are intended to examine whether the resource in question: (a) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage; (b) is associated with the lives of persons important in our past; (c) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or (d) has yielded, or may be likely to yield, information important in pre-history or history.

The term "historical resource" also includes any site described in a local register of historic resources, or identified as significant in a historical resources survey (meeting the requirements of California Public Resources Code section 5024.1(q)).

> CEQA also applies to "unique archaeological resources". Public Resources Code section 21083.2(g) defines a "unique archaeological resource" as any archaeological artifact, object, or site about which it can be clearly demonstrated

that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

In 2014, CEQA was amended to apply to "tribal culture resources" as well, but the amendment did not provide a definition for such resources or identify how they were to be evaluated or mitigated (Pub.Res.Code §§ 21084.2 and 21084.3). Instead, Public Resources Code section 21083.09 required that the Office of Planning and Resource develop and adopt guidelines for analyzing "tribal cultural resources" by July 1, 2016. As of the effective date of this Draft EIR, however, those guidelines have not been finalized or adopted. Consequently, this EIR addresses only historic resources and unique archaeological resources.

All historical resources and unique archaeological resources – as defined by statute – are presumed to be historically or culturally significant for purposes of CEQA (California Public Resources Code section 21084.1; CEQA Guidelines section 15064.5(a)). The lead agency is not precluded from determining that a resource is a historical resource even if it does not fall within this presumption (California Public Resources Code section 21084.1; CEQA Guidelines section 15064.5(a)). A site or resource that does not meet the definition of "historical resource" or "unique archaeological resource" is not considered significant under CEQA and need not be analyzed further (Public Resources Code section 21083.2(a); CEQA Guidelines section 15064.5(c)(4)).

Under CEQA and significant cultural impact results from a "substantial adverse change in the significance of an historical resource [including a unique archaeological resource]" due to the "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines section 15064.5(b)(1); California Public Resources Code section 5020.1(q)). In turn, the significance of a historical resource is materially impaired when a project:

1. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or
2. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources

survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

3. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA.

(CEQA Guidelines section 15064.5(b)(2)).

Pursuant to these sections, the CEQA first evaluates whether a project site contains any "historical resources," then assesses whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource's historical significance is materially impaired.

When a project significantly affects a unique archeological resource, CEQA imposes special mitigation requirements. Specifically, "[i]f it can be demonstrated that a project will cause damage to a unique archeological resource, the lead agency may require reasonable efforts to be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. Examples of that treatment, in no order of preference, may include, but are not limited to, any of the following:"

1. "Planning construction to avoid archeological sites."
2. "Deeding archeological sites into permanent conservation easements."
3. "Capping or covering archeological sites with a layer of soil before building on the sites."
4. "Planning parks, greenspace, or other open space to incorporate archeological sites."

(Pub. Resources Code section 21083.2(b)(1)-(4).)

If these "preservation in place" options are not feasible, mitigation may be accomplished through data recovery. (Pub.Res. Code § 21083.2(d); CEQA Guidelines § 15126.4(b)(3)(C).) Public Resources Code section 21083.2(d) states that "[e]xcavation as mitigation shall be restricted to those parts of the unique archeological resource that would be damaged or destroyed by the project. Excavation as mitigation shall not be required for a unique archeological resource if the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the resource, if this determination is documented in the environmental impact report."

These same requirements are set forth in slightly greater detail in CEQA Guidelines section 15126.4(b)(3), as follows:

(A) Preservation in place is the preferred manner of mitigating impacts to archeological sites. Preservation in place maintains the relationship between

artifacts and the archeological context. Preservation may also avoid conflict with religious or cultural values of groups associated with the site.

(B) Preservation in place may be accomplished by, but is not limited to, the following:

1. Planning construction to avoid archeological sites;
2. Incorporation of sites within parks, greenspace, or other open space;
3. Covering the archeological sites with a layer of chemically stable soil before building tennis courts, parking lots, or similar facilities on the site[; and]
4. Deeding the site into a permanent conservation easement.

(C) When data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provision for adequately recovering the scientifically consequential information from and about the historical resource, shall be prepared and adopted prior to any excavation being undertaken.

Note that, when conducting data recovery, "[i]f an artifact must be removed during project excavation or testing, curation may be an appropriate mitigation." (*Ibid*.) However, "[d]ata recovery shall not be required for an historical resource if the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the archeological or historic resource, provided that determination is documented in the EIR and that the studies are deposited with the California Historical Resources Regional Information Center." (CEQA Guidelines section 15126.4(b)(3)(D).)

California Coastal Act

The California Coastal Act, in part, authorizes the California Coastal Commission (CCC) to review permit applications for development within the coastal zone and, where necessary, to require reasonable mitigation measures to offset effects of that development. Permits for development are issued with "special conditions" to ensure implementation of these mitigation measures.

Section 30244 of the Act, "Archaeological or Paleontological Resources," states that:

> Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

If the CCC determines that a paleontological resource is present within an applicant's proposed project area, they generally look for evidence that the applicant has taken the resource into consideration (e.g., through formal survey by a professional paleontologist with implementation of resulting recommendations). If a paleontological site is present, special permit conditions may

range from avoidance of the site to construction monitoring and/or salvage of significant fossils. This approach virtually parallels the level of protection afforded to paleontological resources by CEQA. Additionally, the CCC relies heavily on project sponsoring or permitting agencies to ensure compliance with CEQA (and consequently, the California Coastal Act). It is worth noting, however, the CCC permits generally post-date a project's environmental document/determination and may not necessarily be consistent with requirements previously issued other regulatory agencies (see SER, Volume 1, Chapter 18).

Public Resources Code Section 5097.5

Section 5097.5 of the California Public Code Section states:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

Senate Bill (SB) 18

The Local and Tribal Intergovernmental Consultation process, commonly known as Senate Bill (SB) 18 was signed into law in September of 2004 and took effect on March 1, 2005. SB 18 established responsibilities for local governments to contact, provide notice to, refer plans to, and consult with California Native American Tribes. The purpose of this consultation process is to protect the identity of the cultural place and to develop appropriate and dignified treatment of the cultural place in any subsequent Project. The consultation is required whenever a general plan, specific plan, or open space designation is proposed for adoption or to be amended. As part of the application process, California Native American Tribes must be given the opportunity to consult with the applicant of the Project and with the City for the purpose of preserving, mitigating impacts to, and identifying cultural places located on Project land within the City of Del Mar's jurisdiction. The Project involves a general plan amendment to the zoning of the Project site; therefore, SB 18 applies to the Project. The proposed Project APE is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project APE as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area." The SB 18 consultation process will be formally initiated by the City of Del Mar. The period for the tribes to request consultation is 90 days after this request is received. To date, we have received no SB 18 letters.

Figure 1 Regional Map

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Solana Beach
SOLANA BEACH
ENCINITAS CORP BDY
SOLANA BEACH COUNTY PARK
Solana Beach
Garden Sch
Central Sch
Earl Warren Jr. High Sch
Skyline Sch
DRIVE
San Diego Military Academy
Eden Gardens
BORDER AVE
DEL MAR RACE TRACK
Fire Sta
DEL MAR
Del Mar
St James Academy
Del Mar Sch
0 1,000 2,000 Feet
Del Mar Resort Specific Plan Area
SOURCE: SOURCE: USGS 7.5-Minute Series Del Mar Quadrangle
Township 14S; Range 4W; Sections 2, 11
FIGURE 2
Project Vicinity Map
DUDEK
Cultural Resources Survey Report
Del Mar Resort Project

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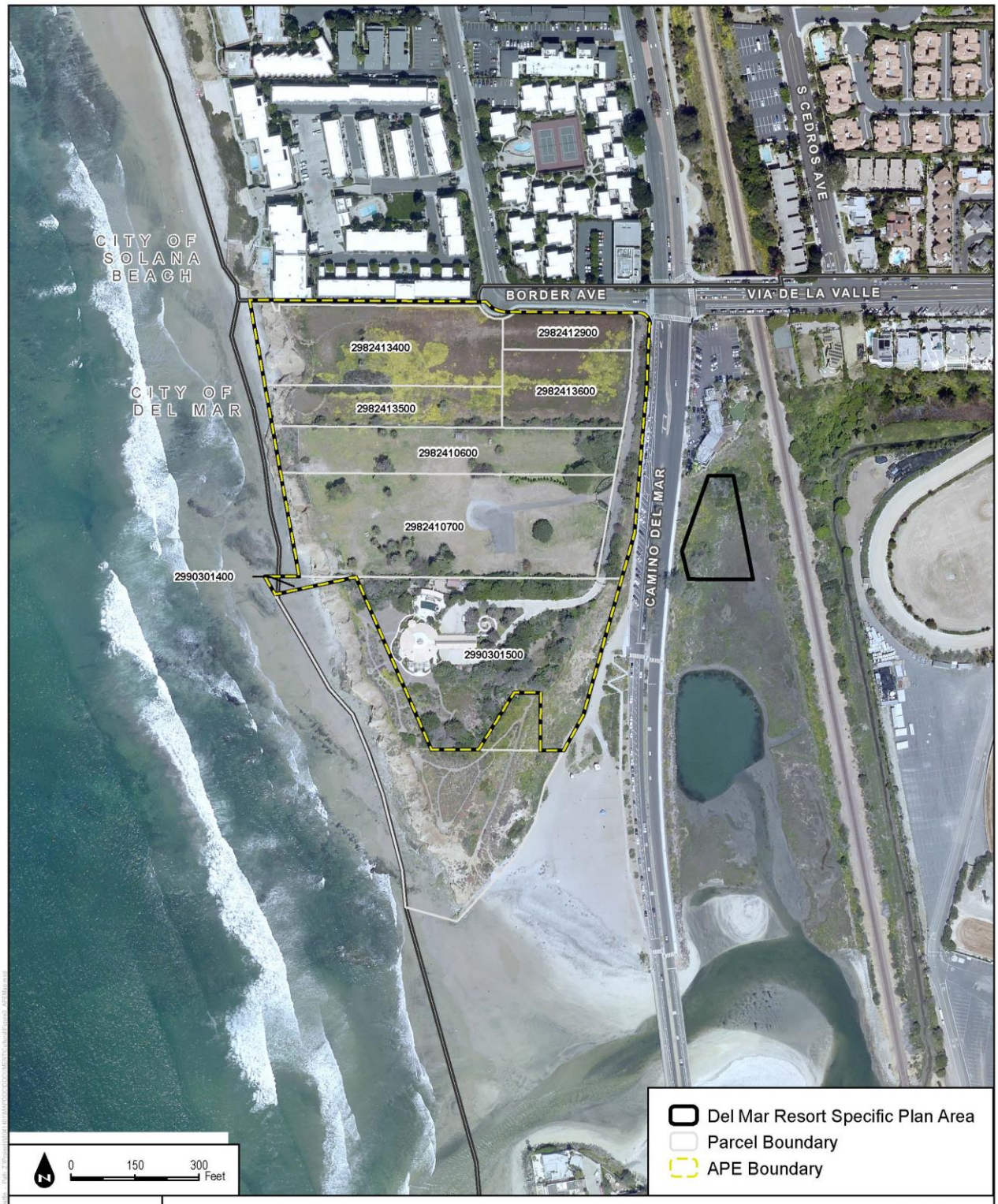

DUDEK

SOURCE: SANGIS 2017

FIGURE 3
Area of Potential Effects

Cultural Resources Survey Report | Del Mar Resort Project

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Assembly Bill (AB) 52

California Assembly Bill (AB) 52, which took effect July 1, 2015, establishes a consultation process between California Native American Tribes and lead agencies in order to address tribal concerns regarding project impacts and mitigation to "tribal cultural resources" (TCR). Public Resources Code section 21074(a) defines TCRs and states that a project that has the potential to cause a substantial adverse change to a TCR is a project that may have an adverse effect on the environment. A TCR is defined as a site, feature, place, cultural landscape, sacred place, and object with cultural value to a California Native American tribe that is either:

1. listed or eligible for listing in the CRHR or a local register of historical resources, or
1. determined by a lead agency to be a TCR.

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2 PROJECT CONTEXT

2.1 Environmental Context

The Project APE's environmental context is as described by Kirkish and Smith in their 1997 report and is included here below:

> The Project APE situated on a coastal mesa bluff adjacent to the Pacific Ocean. The general area is characterized by a coastal mesa and erosional canyons adjacent to the San Dieguito River Valley. Project elevations range from approximately 60 to 90 feet above mean sea level (amsl). The area can be summarized by three significant land form elements: the permanent lagoon, the mesa bluff, and the San Dieguito River Valley. The permanent lagoon at the mouth of the San Dieguito River was created as the sea level rose rapidly after a long period of lower sea levels that had allowed the San Dieguito River to cut a deep canyon in the area of the present-day Del Mar Fairgrounds. The mesa bluff is a narrow extension of coastal marine terrace which provided access to the various resources surrounding the area including fresh water from the canyons, marine resources from the lagoon, and plants and animals from the coast. The third ecological element is the San Dieguito River Valley, which provided a vast volume of biological terrestrial and marine resources available for exploitation.
>
> The project area is heavily disturbed; landscaped residential and disturbed soil vegetation is visible throughout the project parcel. For the most part, non-native vegetation is present in the project area. Much of the northern area had been planted with a variety of crops including alfalfa, oats and rye. Currently, vegetation largely consists of coastal scrub vegetation and grasses in the northern parcels and pepper and palm trees, with other ornamental flora. (Kirkish and Smith 1997)

Common animals within this area may include coyote (*Canis latrans*), California ground squirrel (*Spermophilus beecheyi*), Virginia opossum (*Didelphis virginica*), cottontail *(Sylvilagus audubonit),* deer mouse *(Peromyscus maniculatus)* sparrow *(Melospiza melodia),* lesser goldfinch (*Cardeulis psaltria),*common yellowthroat (*Geothlypis trichas),* as well as a number of other species of birds, mammals, reptiles and amphibians.

2.2 Geological Context

The Project APE primarily lies on Pleistocene marine and non-marine sediments (Kennedy and Peterson 1975). Soil in the area consists of a dark brown silty sand-loam overlying reddish brown sands. At times during the last post-glacial age (approximately the last 18,000 years), sea levels have been lower than the present (Inman 1983). During this period, the San Dieguito lagoon and

all other San Diego county tidal marshes and coastal bluffs experienced major shifts and changes. The fluctuating sea levels correspond to changes in the location of the shoreline during prehistoric occupation of the area and as the sea level rose and then stabilized, the bays continued to fill with sediments and slowly becoming the lagoons environments of today.

2.3 Cultural Context

Evidence for continuous human occupation in the San Diego region spans the last 10,000 years. Various attempts to parse out variability in archaeological assemblages over this broad time frame have led to the development of several cultural chronologies; some of these are based on geologic time, most are based on temporal trends in archaeological assemblages, and others are interpretive reconstructions. Each of these reconstructions describes essentially similar trends in assemblage composition in more or less detail. This research employs a common set of generalized terms used to describe chronological trends in assemblage composition: Paleoindian (pre-5500 BC), Archaic (8000 BC–AD 500), Late Prehistoric (AD 500–1769), and Ethnohistoric (post-AD 1769).

2.3.1 Paleoindian (pre-5500 BC)

Evidence for Paleoindian occupation in coastal Southern California is tenuous, especially considering the fact that the oldest dated archaeological assemblages look nothing like the Paleoindian artifacts from the Great Basin. One of the earliest dated archaeological assemblages in coastal Southern California (excluding the Channel Islands) derives from CA-SDI-4669/W-12, in La Jolla. A human burial from CA-SDI-4669 was radiocarbon dated to 9,590–9,920 years before present (95.4% probability) (Hector 1984). The burial is part of a larger site complex that contained more than 29 human burials associated with an assemblage that fits the Archaic profile (i.e., large amounts of groundstone, battered cobbles, and expedient flake tools). In contrast, typical Paleoindian assemblages include large stemmed projectile points, high proportions of formal lithic tools, bifacial lithic reduction strategies, and relatively small proportions of groundstone tools. Prime examples of this pattern are sites that were studied by Emma Lou Davis (1978) on China Lake Naval Air Weapons Station near Ridgecrest, California. These sites contained fluted and unfluted stemmed points and large numbers of formal flake tools (e.g., shaped scrapers, blades). Other typical Paleoindian sites include the Komodo site (CA-MNO-679)—a multicomponent fluted point site, and CA-MNO-680—a single component Great Basined Stemmed point site (Basgall et al. 2002). At CA-MNO-679 and CA-MNO-680, groundstone tools were rare while finely made projectile points were common.

Turning back to coastal Southern California, the fact that some of the earliest dated assemblages are dominated by processing tools runs counter to traditional notions of mobile hunter–gatherers traversing the landscape for highly valued prey. Evidence for the latter—that is, typical Paleoindian assemblages—may have been located along the coastal margin at one time, prior to

glacial desiccation and a rapid rise in sea level during the early Holocene (pre-7500 BP) that submerged as much as 1.8 kilometer of the San Diego coastline. If this were true, however, it would also be expected that such sites would be located on older landforms near the current coastline. Some sites, such as SDI-210 along Agua Hedionda Lagoon, contained stemmed points similar in form to Silver Lake and Lake Mojave projectile points (pre-8000 BP) that are commonly found at sites in California's high desert (Basgall and Hall 1990). SDI-210 yielded one corrected radiocarbon date of 8520–9520 BP (Warren et al. 2004). However, sites of this nature are extremely rare and cannot be separated from large numbers of milling tools that intermingle with old projectile point forms.

Warren et al. (2004) claimed that a biface manufacturing tradition present at the Harris site complex (SDI-149) is representative of typical Paleoindian occupation in the San Diego region that possibly dates between 10,365 and 8200 BC (Warren et al. 2004, p. 26). Termed San Dieguito (Rogers 1945), assemblages at the Harris site are qualitatively distinct from most others in the San Diego region because the site has large numbers of finely made bifaces (including projectile points), formal flake tools, a biface reduction trajectory, and relatively small amounts of processing tools (Warren 1964, 1968). Despite the unique assemblage composition, the definition of San Dieguito as a separate cultural tradition is hotly debated. Gallegos (1987) suggested that the San Dieguito pattern is simply an inland manifestation of a broader economic pattern. Gallegos' interpretation of San Dieguito has been widely accepted in recent years, in part because of the difficulty in distinguishing San Dieguito components from other assemblage constituents. In other words, it is easier to ignore San Dieguito as a distinct socioeconomic pattern than it is to draw it out of mixed assemblages.

The large number of finished bifaces (i.e., projectile points and non-projectile blades), along with large numbers of formal flake tools at the Harris site complex, is very different than nearly all other assemblages throughout the San Diego region, regardless of age. Warren et al. (2004) made this point, tabulating basic assemblage constituents for key early-Holocene sites. Producing finely made bifaces and formal flake tools implies that relatively large amounts of time were spent for tool manufacture. Such a strategy contrasts with the expedient flake-based tools and cobble-core reduction strategy that typifies non-San Dieguito Archaic sites. It can be inferred from the uniquely high degree of San Dieguito assemblage formality that the Harris site complex represents a distinct economic strategy from non-San Dieguito assemblages.

If San Dieguito truly represents a distinct socioeconomic strategy from the non-San Dieguito Archaic processing regime, its rarity implies that it was not only short-lived, but that it was not as economically successful as the Archaic strategy. Such a conclusion would fit with other trends in southern California deserts, wherein hunting-related tools are replaced by processing tools during the early Holocene (Basgall and Hall 1990).

2.3.2 Archaic (8000 BC–AD 500)

The more than 1500-year overlap between the presumed age of Paleoindian occupations and the Archaic period highlights the difficulty in defining a cultural chronology in the San Diego region. If San Dieguito is the only recognized Paleoindian component in the San Diego region, then the dominance of hunting tools implies that it derives from Great Basin adaptive strategies and is not necessarily a local adaptation. Warren et al. (2004) admitted as much, citing strong desert connections with San Dieguito. Thus, the Archaic pattern is the earliest local socioeconomic adaptation in the San Diego region (Hale 2001, 2009).

The Archaic pattern is relatively easy to define with assemblages that consist primarily of processing tools: millingstones, handstones, battered cobbles, heavy crude scrapers, incipient flake-based tools, and cobble-core reduction. These assemblages occur in all environments across the San Diego region, with little variability in tool composition. Low assemblage variability over time and space among Archaic sites has been equated with cultural conservatism (Byrd and Reddy 2002; Warren 1968; Warren et al. 2004). Despite enormous amounts of archaeological work at Archaic sites, little change in assemblage composition occurs until the bow and arrow is adopted at around AD 500, as well as ceramics at approximately the same time (Griset 1996; Hale 2009). Even then, assemblage formality remains low. After the bow is adopted, small arrow points appear in large quantities and already low amounts of formal flake tools are replaced by increasing amounts of expedient flake tools. Similarly, shaped millingstones and handstones decrease in proportion relative to expedient, unshaped groundstone tools (Hale 2009). Thus, the terminus of the Archaic period is equally as hard to define as its beginning because basic assemblage constituents and patterns of manufacturing investment remain stable, complimented only by the addition of the bow and ceramics.

2.3.3 Late Prehistoric (AD 500–1769)

The period of time following the Archaic and prior to Ethnohistoric times (AD 1769) is commonly referred to as the Late Prehistoric (M. Rogers 1945; Wallace 1955; Warren et al. 2004). However, several other subdivisions continue to be used to describe various shifts in assemblage composition, including the addition of ceramics and cremation practices. In northern San Diego County, the post-AD 1450 period is called the San Luis Rey Complex (True 1980), while the same period in southern San Diego County is called the Cuyamaca Complex and is thought to extend from AD 500 until Ethnohistoric times (Meighan 1959). Rogers (1929) also subdivided the last 1,000 years into the Yuman II and III cultures, based on the distribution of ceramics. Despite these regional complexes, each is defined by the addition of arrow points and ceramics, and the widespread use of bedrock mortars. Vagaries in the appearance of the bow and arrow and ceramics make the temporal resolution of the San Luis Rey and Cuyamaca complexes difficult. For this reason, the term Late Prehistoric is well-suited to describe the last 1,500 years of prehistory in the San Diego region.

Temporal trends in socioeconomic adaptations during the Late Prehistoric period are poorly understood. This is partly due to the fact that the fundamental Late Prehistoric assemblage is very similar to the Archaic pattern, but includes arrow points and large quantities of fine debitage from producing arrow points, ceramics, and cremations. The appearance of mortars and pestles is difficult to place in time because most mortars are on bedrock surfaces; bowl mortars are actually rare in the San Diego region. Some argue that the Ethnohistoric intensive acorn economy extends as far back as AD 500 (Bean and Shipek 1978). However, there is no substantial evidence that reliance on acorns, and the accompanying use of mortars and pestles, occurred prior to AD 1400. True (1980) argued that acorn processing and ceramic use in the northern San Diego region did not occur until the San Luis Rey pattern emerged after approximately AD 1450. For southern San Diego County, the picture is less clear. The Cuyamaca Complex is the southern counterpart to the San Luis Rey pattern, however, and is most recognizable after AD 1450 (Hector 1984). Similar to True (1980), Hale (2009) argued that an acorn economy did not appear in the southern San Diego region until just prior to Ethnohistoric times, and that when it did occur, a major shift in social organization followed.

2.3.4 Ethnohistoric (post-AD 1769)

The history of the Native American communities prior to the mid-1700s has largely been reconstructed through later mission-period and early ethnographic accounts. The first records of the Native American inhabitants of the San Diego region come predominantly from European merchants, missionaries, military personnel, and explorers. These brief, and generally peripheral, accounts were prepared with the intent of furthering respective colonial and economic aims and were combined with observations of the landscape. They were not intended to be unbiased accounts regarding the cultural structures and community practices of the newly encountered cultural groups. The establishment of the missions in the San Diego region brought more extensive documentation of Native American communities, though these groups did not become the focus of formal and in-depth ethnographic study until the early twentieth century (Boscana 1846; Fages 1937; Harrington 1934; Laylander 2000). The principal intent of these researchers was to record the precontact, culturally specific practices, ideologies, and languages that had survived the destabilizing effects of missionization and colonialism. This research, often understood as "salvage ethnography," was driven by the understanding that traditional knowledge was being lost due to the impacts of modernization and cultural assimilation. Alfred Kroeber applied his "memory culture" approach (Lightfoot 2005, p. 32) by recording languages and oral histories within the San Diego region. Kroeber's 1925 assessment of the impacts of Spanish missionization on local Native American populations supported Kumeyaay traditional cultural continuity (Kroeber 1925, p. 711):

> San Diego was the first mission founded in upper California; but the geographical limits of its influence were the narrowest of any, and its effects on the natives comparatively light. There seem to be two reasons for this: first, the stubbornly resisting temper of the natives; and second, a failure of the rigorous concentration policy enforced elsewhere.

In some ways this interpretation led to the belief that many California Native American groups simply escaped the harmful effects of contact and colonization all together. This, of course, is untrue. Ethnographic research by Dubois, Kroeber, Harrington, Spier, and others during the early twentieth century seemed to indicate that traditional cultural practices and beliefs survived among local Native American communities. These accounts supported, and were supported by, previous governmental decisions which made San Diego County the location of more federally recognized tribes than anywhere else in the United States: 18 tribes on 18 reservations that cover more than 116,000 acres (CSP 2009).

The traditional cultural boundaries between the Luiseño and Kumeyaay Native American tribal groups have been well defined by anthropologist Florence C. Shipek:

> In 1769, the Kumeyaay national territory started at the coast about 100 miles south of the Mexican border (below Santo Tomas), thence north to the coast at the drainage divide south of the San Luis Rey River including its tributaries. Using the U.S. Geological Survey topographic maps, the boundary with the Luiseño then follows that divide inland. The boundary continues on the divide separating Valley Center from Escondido and then up along Bear Ridge to the 2240 contour line and then north across the divide between Valley Center and Woods Valley up to the 1880-foot peak, then curving around east along the divide above Woods Valley. [1993 summarized by the San Diego County Board of Supervisors 2007:6]

Based on ethnographic information, it is believed that at least 88 different languages were spoken from Baja California Sur to the southern Oregon state border at the time of Spanish contact (Johnson and Lorenz 2006, p. 34). The distribution of recorded Native American languages has been dispersed as a geographic mosaic across California through six primary language families (Golla 2007, p. 71). As the project area is located approximately 30 km south of the San Luis Rey River, the Native American inhabitants of the region spoke using the Ipai language subgroup of the Yuman language group. Ipai and Tipai, spoken respectively by the northern and southern Kumeyaay communities, are mutually intelligible. For this reason, these two are often treated as dialects of a larger Kumeyaay tribal group rather than as distinctive languages, though this has been debated (Luomala 1978; Laylander 2010).

Victor Golla has contended that one can interpret the amount of variability within specific language groups as being associated with the relative "time depth" of the speaking populations (Golla 2007, p. 80) A large amount of variation within the language of a group represents a greater time depth then a group's language with less internal diversity. One method that he has employed is by drawing comparisons with historically documented changes in Germanic and Romantic language groups. Golla has observed that the "absolute chronology of the internal diversification within a language family" can be correlated with archaeological dates (2007, p. 71). This type of

interpretation is modeled on concepts of genetic drift and gene flows that are associated with migration and population isolation in the biological sciences.

Golla suggested that there are two language families associated with Native American groups who traditionally lived throughout the San Diego County region. The northern San Diego tribes have traditionally spoken Takic languages that may be assigned to the larger Uto–Aztecan family (Golla 2007, p. 74). These groups include the Luiseño, Cupeño, and Cahuilla. Golla has interpreted the amount of internal diversity within these language-speaking communities to reflect a time depth of approximately 2,000 years. Other researchers have contended that Takic may have diverged from Uto–Aztecan ca. 2600 BC–AD 1, which was later followed by the diversification within the Takic speaking San Diego tribes, occurring approximately 1500 BC–AD 1000 (Laylander 2010). The majority of Native American tribal groups in southern San Diego region have traditionally spoken Yuman languages, a subgroup of the Hokan Phylum. Golla has suggested that the time depth of Hokan is approximately 8,000 years (Golla 2007, p. 74). The Kumeyaay tribal communities share a common language group with the Cocopa, Quechan, Maricopa, Mojave, and others to east, and the Kiliwa to the south. The time depth for both the Ipai (north of the San Diego River, from Escondido to Lake Henshaw) and the Tipai (south of the San Diego River, the Laguna Mountains through Ensenada) is approximated to be 2,000 years at the most. Laylander has contended that previous research indicates a divergence between Ipai and Tipai to have occurred approximately AD 600–1200 (Laylander 1985). Despite the distinct linguistic differences between the Takic-speaking tribes to the north, the Ipai-speaking communities in central San Diego, and the Tipai southern Kumeyaay, attempts to illustrate the distinctions between these groups based solely on cultural material alone have had only limited success (Pigniolo 2004; True 1966).

The Kumeyaay generally lived in smaller family subgroups that would inhabit two or more locations over the course of the year. While less common, there is sufficient evidence that there were also permanently occupied villages, and that some members may have remained at these locations throughout the year (Owen 1965; Shipek 1982; Shipek 1985; Spier 1923). Each autonomous triblet was internally socially stratified, commonly including higher status individuals such as a tribal head (Kwaaypay), shaman (Kuseyaay), and general members with various responsibilities and skills (Shipek 1982). Higher-status individuals tended to have greater rights to land resources, and owned more goods, such as shell money and beads, decorative items, and clothing. To some degree, titles were passed along family lines; however, tangible goods were generally ceremonially burned or destroyed following the deaths of their owners (Luomala 1978). Remains were cremated over a pyre and then relocated to a cremation ceramic vessel that was placed in a removed or hidden location. A broken metate was commonly placed at the location of the cremated remains, with the intent of providing aid and further use after death. At maturity, tribal members often left to other bands in order to find a partner. The families formed networks of communication and exchange around such partnerships.

Areas or regions, identified by known physical landmarks, could be recognized as band-specific territories that might be violently defended against use by other members of the Kumeyaay. Other areas or resources, such as water sources and other locations that were rich in natural resources, were generally understood as communal land to be shared amongst all the Kumeyaay (Loumala 1978). The coastal Kumeyaay exchanged a number of local goods, such as seafood, coastal plants, and various types of shell for items including acorns, agave, mesquite beans, gourds, and other more interior plants of use (Luomala 1978). Shellfish would have been procured from three primary environments, including the sandy open coast, bay and lagoon, and rocky open coast. The availability of these marine resources changed with the rising sea levels, siltation of lagoon and bay environments, changing climatic conditions, and intensity of use by humans and animals (Gallegos and Kyle 1988; Pigniolo 2005). Shellfish from sandy environments included *Donax*, *Saxidomas*, *Tivela*, and others. Rocky coast shellfish dietary contributions consisted of *Pseudochama*, *Megastraea*, *Saxidomus*, *Prototthaca*, *Megathura*, and others. Lastly, the bay environment in the immediate vicinity of the project area would have provided *Argopecten*, *Chione*, *Ostrea*, *Neverita*, *Macoma*, *Tagelus*, and others. While marine resources were obviously consumed, terrestrial animals and other resources likely provided a large portion of sustenance. Game animals consisted of rabbits, hares (*Leporidae*), birds, ground squirrels, woodrats (*Neotoma*), deer, bears, mountain lions (*Puma concolor*), bobcats (*Lynx rufus)*, coyotes (*Canus latrans*), and others. In lesser numbers, reptiles and amphibians may have been consumed.

A number of local plants were used for food and medicine. These were exploited seasonally, and were both traded between regional groups and gathered as a single triblet moved between habitation areas. Some of the more common of these that might have been procured locally or as higher elevation varieties would have included buckwheat (*Eriogonum fasciculatum*), *Agave*, *Yucca*, lemonade berry (*Rhus integrifolia*), sugar brush (*Rhus ovata*), sage scrub (*Artemisia californica*), yerba santa (*Eriodictyon*), sage (*Salvia*), *Ephedra*, prickly pear (*Opuntia*), mulefat (*Baccharis salicifolia*), chamise (*Adenostoma fasciculatum*), elderberry (*Sambucus nigra*), oak (*Quercus*), willow (Salix), and *Juncus* grass among many others (Wilken 2012).

2.3.5 The Historic Period (post-AD 1542)

European activity in the region began as early as AD 1542, when Juan Rodríguez Cabrillo landed in San Diego Bay. Sebastián Vizcaíno returned in 1602, and it is possible that there were subsequent contacts that went unrecorded. These brief encounters made the local native people aware of the existence of other cultures that were technologically more complex than their own. Epidemic diseases may also have been introduced into the region at an early date, either by direct contacts with the infrequent European visitors or through waves of diffusion emanating from native peoples farther to the east or south (Preston 2002). It is possible, but as yet unproven, that the precipitous demographic decline of native peoples had already begun prior to the arrival of Gaspar de Portolá and Junípero Serra in 1769.

Spanish colonial settlement was initiated in 1769, when multiple expeditions arrived in San Diego by land and sea, and then continued northward through the coastal plain toward Monterey. A military presidio and a mission to deal with the local Kumeyaay and Ipai were soon firmly established at San Diego, despite violent resistance to them from a coalition of native communities in 1776. Private ranchos subsequently established by Spanish and Mexican soldiers, as well as other non-natives, appropriated much of the remaining coastal or near-coastal locations (Pourade 1960–1967).

Mexico's separation from the Spanish empire in 1821 and the secularization of the California missions in the 1830s caused further disruptions to native populations in western San Diego County. Some former mission neophytes were absorbed into the work forces on the ranchos, while others drifted toward the urban centers at San Diego and Los Angeles or moved to the eastern portions of the county where they were able to join still largely autonomous native communities. United States conquest and annexation, together with the gold rush in Northern California, brought many additional outsiders into the region. Development during the following decades was fitful, undergoing cycles of boom and bust. With rising populations in the nineteenth century throughout the Southern California region, there were increased demands for important commodities such as salt.

2.4 Previous Cultural Resource Investigations

Dudek Staff conducted an in-house record search at the South Coastal Information Center (SCIC) for the proposed Project APE and a surrounding 1-mile buffer area on June 19, 2017. The record search indicated that 60 previous cultural investigations have been conducted within 1-mile of the current Project APE, 10 of which cover all or a portion of the APE. Table 1 lists the previous cultural studies conducted within the 1-mile search buffer, with the studies covering all or a portion of the current Project site listed in bold (Table 1). Many of the previous studies have also covered the alignment of the proposed water line alternatives.

Table 1
Previous Cultural Studies conducted within the Project APE and 1-mile Record Search

Report I.D.	Title	Author	Year
SD-00624	ARCHAEOLOGICAL SURVEY FOR THE PROPOSED BEACH ACCESSES AT "D" AND "J" STREETS, ENCINITAS AND SEASCAPE SURF, DEL MAR	DEPT. OF TRANSPROTATION	1974
SD-07433	CULTURAL RESOURCES ASSESSMENT FOR THE LOMAS SANTA FE GRADE SEPARATION SOLANA BEACH, CALIFORNIA	EARTH TECH CORP	1993
SD-01441	A REPORT OF AN ARCHAEOLOGICAL SAMPLING PROGRAM AT SITE W-36 (SDI-10238), LA VIDA DEL MAR PROJECT, SOLANA BEACH, CALIFORNIA P-85-55 EAD LOG #85-13-17	BRIAN F. SMITH AND ASSOCIATES	1986
SD-01667	ARCHAEOLOGICAL TEST EXCAVATIONS AT SDM-W-36 CITY OF SOLANA BEACH, CALIFORNIA.	RECON	1988

Table 1
Previous Cultural Studies conducted within the Project APE and 1-mile Record Search

Report I.D.	Title	Author	Year
SD-03549	**RESULTS OF A DATA RECOVERY PROGRAM AT SITE SDI-7979, THE WHITTIER-DEL MAR PROJECT AT BORDER AVENUE, DEL MAR, CALIFORNIA**	**CITY OF DEL MAR PLANNING DEPARTMENT**	**1997**
SD-04076	AN ARCHAEOLOGICAL SURVEY AND EVALUATION OF A CULTURAL RESOURCE FOR THE HEALTH CARE GROUP PROJECT	BRIAN F. SMITH AND ASSOCIATES	2000
SD-04177	**ARCHAEOLOGICAL INVESTIGATIONS FOR THE SAN DIEGUITO WETLAND RESTORATION PROJECT EIR/EIS**	**SCIENCE APPLICATION INTERNATIONAL CORPORATION**	**2000**
SD-02172	DRAFT ENVIRONMENTAL IMPACT REPORT FOR SOLANA BEACH INNSUITES 585-14 LOG#84-7-58	MOONEY-LETTIERI AND ASSOCIATES,INC	1985
SD-00093	ARCHAEOLOGICAL SURVEY AND AIR QUALITY ANALYSIS MOLA VISTA SUBDIVISION (TM 3608, LOG #77-13-11) SOLANA BEACH, CALIFORNIA.	ADVANCE PLANNING & RESEARCH ASSOCIATES	1977
SD-01851	CULTURAL RESOURCES SURVEY OF THE SAN DIEGO COMMUTER RAIL PROJECT.	RECON	1989
SD-04968	DRAFT EIR FOR THE MICKELLAR JOSEPH DEVELOPMENT	RECON	1982
SD-02958	NEGATIVE ARCHAEOLOGICAL SURVEY REPORT 11-SD-5, P.M. R35.2, 189161	CALTRANS	1994
SD-00253	AN ARCHAEOLOGICAL SURVEY OF THE SEAWIND-DEL MAR PROPERTY.	RECON	1977
SD-00672	**A CULTURAL RESOURCE OVERVIEW FOR THE SAN DIEGUITO RIVER VALLEY SAN DIEGO, CALIFORNIA.**	**WESTEC SERVICES, INC.**	**1988**
SD-09361	**ARCHAEOLOGICAL SURVEY REPORT FOR THE PHASE I ARCHAEOLOGICAL SURVEY ALONG INTERSTATE 5 SAN DIEGO COUNTY, CA.**	**ASM, INC.**	**2002**
SD-06258	NEGATIVE HISTORIC PROPERTY SURVEY REPORT-I-5/LOMAS SANTE FE DR INTERCHANGE	CALTRANS	2002
SD-08275	SECTION 106 COMPLIANCE & FILING OF NEGATIVE HPSRS	CALTRANS	2002
SD-06440	**DRAFT ARCHAEOLOGICAL INVESTIGATIONS FOR THE SAN DIEGUITO WETLANDS RESTORATION PROJECT EIR/EIS**	**SCIENCE APPLICATION INTERNATIONAL CORP.**	**1999**
SD-06444	**ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT (EIR/EIS) FOR THE SAN DIEGUITO WETLANDS RESTORATION PROJECT**	**U.S. FISH & WILDLIFE**	**2000**
SD-06645	NEGATIVE ARCHAEOLOGICAL SURVEY GRAND AVENUE & OLD DEL MAR AIRPORT	MARTIN ROSEN	1994
SD-09372	COMPLETION OF SECTION 106 REQUIREMENTS, FILING OF 2ND SUPPLEMENTAL HISTORIC PROPERTY SURVEY REPORT	CALTRANS	2005
SD-07109	TEST EXCAVATIONS AT THE DEL MAR SITE (SDI-191)	WARREN, C.	1959

Table 1
Previous Cultural Studies conducted within the Project APE and 1-mile Record Search

Report I.D.	Title	Author	Year
SD-07433	CULTURAL RESOURCES ASSESSMENT FOR THE LOMAS SANTA FE GRADE SEPARATION SOLANA BEACH, CALIFORNIA	EARTH TECH CORP	1993
SD-06629	HISTORIC PROPERTY SURVEY REPORT OCEANSIDE TO SAN DIEGO-RAIL TO TRAIL	MARTIN ROSEN	1999
SD-04236	ENVIRONMENTAL IMPACT REPORT FOR SAN DIEGUITO RIVER STUDY DRAFT CONCEPTUAL MASTER PLAN	APEC	1981
SD-09362	ARCHAEOLOGICAL TESTING AT TWELVE PREHISTORIC SITES (SDI-603, -628, -4553, -6831, -6882, 10965, -12670, 13484, 15678, 15679, 15680) ON THE CENTRAL SAN DIEGO COAST, SAN DIEGO COUNTY, CA.A2.	ASM	2004
SD-09372	COMPLETION OF SECTION 106 REQUIREMENTS, FILING OF 2ND SUPPLEMENTAL HISTORIC PROPERTY SURVEY REPORT	CALTRANS	2005
SD-09516	THE CEMETERIES AND GRAVESTONES OF SAN DIEGO COUNTY: AN ARCHAEOLOGICAL STUDY.	DAVID CATERINO	2005
SD-10415	**CULTURAL RESOURCES ASSESSMENT DEL MAR FAIRGROUNDS PROJECT CITIES OF DEL MAR AND SAN DIEGO, SAN DIEGO COUNTY, CALIFORNIA**	**LSA ASSOCIATES, INC.**	**2006**
SD-10433	**NATIONAL REGISTER OF HISTORIC PLACES INVENTORY NOMINATION FORM FOR THE SITE OF THE DEL MAR MAN/DEL MAR NORTH BLUFFS PRESERVE**	**CITY OF DEL MAR**	**1980**
SD-10610	NATIONAL REGISTER OF HISTORIC PLACES INVENTORY- NOMINATION FORM FOR THE DEL MAR NORTH BLUFFS PRESERVE, THE SITE OF DEL MAR MAN	PARK AND RECREATION COMMITTEE AND CITY MANAGER.	1980
SD-10885	ARCHAEOLOGICAL AND GEOSPATIAL INVESTIGATIONS OF FIRE-ALTERED ROCK FEATURES AT TORREY PINES STATE RESERVE, SAN DIEGO, CALIFORNIA	SCOTT A. MATTINGLY	2007
SD-11191	PALEONTOLOGICAL MONITORING REPORT, FLETCHER COVE PARK IMPROVEMENTS PROJECT, CITY OF SOLANA BEACH, SAN DIEGO COUNTY, CALIFORNIA	BRIAN F. SMITH AND ASSOCIATES	2007
SD-11192	RESULTS OF ARCHAEOLOGICAL MONITORING FOR CONSTRUCTION OF THE FLETCHER COVE PARK IMPROVEMENTS PROJECT	BRIAN F. SMITH AND ASSOCIATES	2007
SD-11623	**SAN DIEGUITO RIVER VALLEY INVENTORY OF ARCHAEOLOGICAL RESOURCES**	**ASM AFFILIATES**	**2002**
SD-11761	HISTORIC PROPERTY SURVEY REPORT, I-5 NORTH COAST WIDENING PROJECT	CALTRANS	2007
SD-12117	**RESULTS OF THE ARCHAEOLOGICAL MONITORING PROGRAM FOR THE SAN DIEGUITO WETLANDS RESTORATION PROJECT, SAN DIEGO COUNTY, CALIFORNIA**	**RECON ENVIRONMENTAL INC.**	**2009**

Table 1
Previous Cultural Studies conducted within the Project APE and 1-mile Record Search

Report I.D.	Title	Author	Year
SD-12273	CULTURAL RESOURCE EVALUATION OF THE RIVERPARK OFFICE PROJECT, CITY OF DEL MAR, CALIFORNIA	AFFINIS	2004
SD-12817	CULTURAL RESOURCES SURVEY FOR 57 WOOD TO STEEL POLE UNDERGROUNDING AND POLE REPLACEMENTS ALONG TL667 AND TL610 AND STAGING YARD AREAS ALONG VIA DE LA VALLE AND EL CAMINO REAL, DEL MAR AREA OF SAN DIEGO COUNTY, CALIFORNIA	AECOM	2010
SD-12989	SOLANA BEACH SENIOR ARCHAEOLOGY	AFFINIS ENVIRONMENTAL SERVICES	2011
SD-13337	RESIDENTIAL CARE FACILITY, 959 GENEVIEVE STREET- ARCHAEOLOGY (AFFINIS JOB NO. 2428)	AFFINIS	2011
SD-14049	CULTURAL RESOURCE SURVEY UPDATE BRIDGE 243.0 REVETMENT PROJECT, DEL MAR, CALIFORNIA	ASM AFFILIATES, INC.	2011
SD-14092	CULTURAL AND HISTORICAL RESOURCE INVENTORY AND EVALUATION REPORT FOR THE SAN DIEGUITO RIVER BRIDGE REPLACEMENT AND SECOND TRACK PROJECT, DEL MAR, SNA DIEGO COUNTY, CALIFORNIA	ASM AFFILIATES, INC.	2009
SD-13488	CULTURAL RESOURCES INVESTIGATION IN SUPPORT OF CONSULTATION FOR THE REGIONAL BEACH SAND II PROJECT SAN DIEGO COUNTY, CALIFORNIA	AECOM	2011
SD-14397	RECORD SEARCH RESULTS FOR THE UNDERGROUND UTILITY DISTRICT VIA DE LA VALLE PROJECT	LAGUNA MOUNTAIN ENVIRONMENTAL, INC.	2010
SD-14086	CULTURAL AND HISTORICAL RESOURCES CONSTRAINTS REPORT FOR THE SAN DIEGUITO BRIDGE REPLACEMENT AND SECOND TRACK PROJECT; DEL MAR TUNNEL ALTERNATIVES ANALYSIS	ASM AFFILIATES, INC.	2012
SD-13916	INTERSTATE 5 NORTH COAST CORRIDOR PROJECT SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT REPORT/ ENVIRONEMENTAL IMPACT STATEMENT	CALTRANS	2012
SD-14615	I-5 NORTH CORRIDOR PROJECT SUPPLEMENTALS	CALTRANS	2013
SD-14495	INTERSTATE 5 NORTH COAST CORRIDOR PROJECT FINAL ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT AND SECTION 4(F) EVALUATION	CALTRANS	2013
SD-14523	LETTER REPORT: ETS 20354- CULTURAL RESOURCES MONITORING FOR TRANSMISSION LINE UNDERGROUNDING AND POLE INSTALLATION FOR TIE LINE 610 AND TIE LINE 667 ALONG VIA DE LA VALLE, CITY OF DEL MAR, SAN DIEGO COUNTY, CALIFORNIA- IO 200410700	AECOM	2013
SD-15797	DRAFT CULTURAL RESOURCES ASSESSMENT REGIONAL BEACH SAND PROJECT II, SAN DIEGO COUNTY, CALIFORNIA	AECOM	2010

Table 1
Previous Cultural Studies conducted within the Project APE and 1-mile Record Search

Report I.D.	Title	Author	Year
SD-16096	CULTURAL RESOURCE RECORDS SEARCH AND SITE SURVEY AT&T SITE SD0420 SOLANA BEACH 305 SOUTH HIGHWAY 101 SOLANA BEACH, SAN DIEGO COUNTY, CALIFORNIA 92075 CASPR# 3601003480	ACE ENVIRONMENTAL	2013
SD-16097	HISTORIC ARCHITECTURAL RESOURCE-INVENTORY AND ASSESSMENT AT&T SITE SD0420 SOLANA BEACH 305 SOUTH HIGHWAY 101 SOLANA BEACH, SAN DIEGO COUNTY, CALIFORNIA 92075 CASPR# 3601003480	ACE ENVIRONMENTAL	2013
SD-16127	2007 CULTURAL RESOURCES TREATMENT PLAN NORTH COAST INTERSTATE 5 CORRIDOR	CALTRANS	2008
SD-16131	SIXTH SUPPLEMENTAL HISTORIC PROPERTY SURVEY REPORT (HPSR): REVISED AREA OF POTENTIAL EFFECTS (APE) I-5 NORTH COAST CORRIDOR	CALTRANS	2013
SD-16132	NCTD POSITIVE TRAIN CONTROL PROJECT - NCTD BASE RADIO SITE NAME: CP VALLEY (LATITUDE 32.986641, LONGITUDE -117.270114), SOLANA BEACH, SAN DIEGO COUNTY, CA 92075	OFFICE OF HISTORIC PRESERVATION, DEPARTMENT OF PARKS AND RECREATION.	2014
SD-16142	CULTURAL RESOURCES SURVEY REPORT FOR HIGHWAY 101 AND DAHLIA DRIVE MIXED USE PROJECT, SOLANA BEACH, CALIFORNIA	ATKINS	2015
SD-16294	CULTURAL RESOURCES STUDY FOR THE OCEAN RANCH ESTATES PROJECT, CITY OF SOLANA BEACH, SAN DIEGO COUNTY, CALIFORNIA	BRIAN F. SMITH AND ASSOCIATES	2015
SD-16381	CULTURAL RESOURCES ASSESSMENT OF THE DEL MAR GRANDSTANDS PROJECT, DEL MAR, SAN DIEGO COUNTY, CALIFORNIA (BCR CONSULTING PROJECT NO. TRF1517)	BRC CONSULTING	2015
SD-16729	ETS 31031 - CULTURAL RESOURCES MONITORING FOR POLE REPLACEMENT P61716, DEL MAR, NORTH SAN DIEGO COUNTY, CALIFORNIA - IO 7074264	CALTRANS	2015

The SCIC record search conducted for this Project also indicated that two previous cultural resources have been recorded within, or partially within the current Project site. Additionally, there are 20 sites previously recorded within the 1-mile search buffer area (Table 2). Two prehistoric sites intersect, or are within the current Project site, including sites CA-SDI-7979 and CA-SDI-10940 (SDM-W-34A, or also known as the "Del Mar Man Site"). Table 2 lists the previously recorded resources within the Project site and the record search 1-mile buffer area; the two resources located within the APE are listed in bold (Table 2). No cultural resources have been recorded in the off-site impact area, although site CA-SDI-192 is within about 100 feet of the second water line alignment.

Table 2
Previously recorded Cultural Resources in the Project APE and 1-mile Record Search

P-Number	Trinomial	Era	Resource Type	In/Out Current APE
P-37-007979	**CA-SDI-7979**	**Prehistoric**	**Artifact scatter and shell midden, habitation site**	**IN**
P-37-010940	**CA-SDI-10940**	**Prehistoric**	**Habitation site with midden and documented burials**	**IN**
P-37-000191	CA-SDI-191	Prehistoric	Habitation site	Out
P-37-000192	CA-SDI-192	Prehistoric	Habitation site	Out
P-37-010238	CA-SDI-10238	Prehistoric	Habitation site	Out
P-37-013484	CA-SDI-13484	Prehistoric	Midden site	Out
P-37-013506	CA-SDI-13506	Historic	Industrial built environment	Out
P-37-013507	CA-SDI-13507	Historic	Industrial built environment	Out
P-37-017025	CA-SDI-15065	Historic	Military/industrial built environment	Out
P-37-018807	CA-SDI-15885	Prehistoric	Midden site	Out
P-37-033561	-	Prehistoric	Isolated bowl mortar fragment	Out
P-37-033562	-	Prehistoric	Isolated portable milling mortar	Out
P-37-034886	-	Historic	Private residential built environment	Out
P-37-034956	-	Historic	San Dieguito River Railroad Bridge	Out
P-37-035855	-	Historic	CVS structure	Out
P-37-035935	-	Historic	Del Mar Infield Pavilion	Out
P-37-035936	-	Historic	Del Mar Thoroughbred Club Grandstand and Racetrack Complex	Out
P-37-036415	-	Historic	Del Mar-TL 666 Utility route	Out
P-37-036418	-	Historic	Del Mar Substation	Out
P-37-036421	-	Historic	Isolated Glass Insulator	Out
P-37-036422	-	Historic	Del Blue Print Co/Del Mar Automotive building	Out
P-37-036423	-	Historic	Old Grand Avenue Bridge	Out

2.4.1 CA-SDI-7979

Records indicate that CA-SDI-7979 consists of a prehistoric habitation/midden site that included a wide range of artifacts and tools, which was initially recorded in 1980, long after the property had been residentially developed. CA-SDI-7979 was initially tested by RECON Inc. in 1995, at which time the site was determined to be significant under CEQA. A subsequent data recovery program, designed with approval of the City of Del Mar to mitigate adverse impacts to the site, was conducted by Brian F. Smith and Associates (BFSA) in 1996. The data recovery program conducted in 1996 included the excavation of six mechanically excavated trenches, nine test units, and one hand-excavated trench. These subsurface investigations yielded a recovery of 1,558 prehistoric artifacts (flakedstone, lithic tools, groundstone and percussion tools and fragments –

no ceramic artifacts), 35,945 grams of marine invertebrate shell remains, and 217 grams of bone (Kirkish and Smith 1997). Despite the high volume of material and artifacts recovered from the site, apparently no features were identified during any of the subsurface investigations. Following the conclusion of data recovery, BFSA recommended that, outside of monitoring, no further cultural work was necessary at SDI-7979 (Kirkish and Smith 1997).

2.4.2 CA-SDI-10940

CA-SDI-10940, also known as the "Del Mar Man Site" is a large habitation/midden site, originally recorded by Malcom Rogers (circa 1929), which became the center of controversy in the late-1970s-early-1980s when bone dating procedures provided evidence that a skull from this site was over 48,000 years old. The procedures used at the time were since proven to be inaccurate and in 1984 the previous date was retracted. Modern ^{14}C accelerator mass spectrometer (AMS) procedures provide currently-accepted evidence that date the skull to approximately 5,000 years old. The site, apparent from the record search data, has been the focus of three previous cultural investigations in 1929, 1963, and 1974, prior to development of the area, (Confidential Appendix B) and then re-visited in 1988 after the southern portion of the property (south of the current developed residence) had been residentially developed, then subsequently demolished, and abandoned (Appendix D).

Excavation notes from Rogers archaeological investigations at CA-SDI-10940 are somewhat unclear as to the actual volume and recovery of cultural materials and artifacts; however, from maps of the excavations, it appears Rogers excavated a total of 30 excavation units in the southern and lower terrace portion of the site (identified by Rogers as "W-34") and excavated two test pit excavation units on the upper terrace portion of the site (identified by Rogers as "W-34A") (Confidential Appendix B, p. 276-277).

In 1995, Dayle Cheever with RECON Environmental Inc., conducted a cultural resource significance testing project at the site and encountered cultural materials and artifacts scattered along the upper terrace, W-34A; the 1995 testing excavations apparently did not extend to the lower terrace, W-34. A total of six shovel test pits (STPs) and two sample (1m x 1m) units were excavated along the northern terrace. Three out of the six STPs were positive and both of the sample units were positive, as they were intentionally placed near positive STPs. In general, cultural materials were recovered from the ground surface to approximately 80 cm below the surface (cmbs). A total of 9,228 grams of marine invertebrate shell fragments, 5 grams of bone, 56 flakedstone (flakes and debitage) artifacts, 6 flakedstone tools (including 5 hammerstones and 1 chopper), and 1 milling handstone was recovered from the subsurface excavations (Cheever 1995).

The RECON testing of CA-SDI-10940 established that portions of CA-SDI-10940 were still intact and in relatively undisturbed condition. In fact, the Cheever report stated that the site had at one

time previously been capped with sterile dirt as a method of preservation (Cheever 1995). Cheever concludes that CA-SDI-10940 is "a significant site under criteria B, D, and E of CEQA. This site may also be interpreted to qualify under criterion C, because of the destruction of many coastal archaeological sites through development and/or intensive agriculture" (Cheever 1995). Cheever recommends that a data recovery program would be needed to be conducted at CA-SDI-10940 to mitigate potential destruction of this resource. Following the data recovery, Cheever (1995) recommended that Native American and archaeological monitors should be present during construction grading or other ground-disturbing activities for potential projects. Finally, it was recommended that an Archaeological Resource Management Report (ARMR) technical report would need to be prepared and submitted to the City of Del Mar, for review by City staff and approved before map or permit approval (Cheever 1995). A copy of the 1995 excavation report authored by Dayle Cheever is available in Appendix B.

2.4.3 CA-SDI-192

According to the site record, this site was originally recorded by Treganza, but a date was not given. The site record contains little to no information about the site, other than a sketch map showing its location with "San Dieguito Village" written on it. The site is located south of the lagoon, near but clearly outside the second water line alignment.

2.5 Tribal Correspondence

California Assembly Bill (AB) 52, which took effect July 1, 2015, establishes a consultation process between California Native American Tribes and lead agencies in order to address tribal concerns regarding project impacts and mitigation to "tribal cultural resources" (TCR). As such, the City of Del Mar is the lead agency and is responsible for conducting formal consultation with the local Tribes. However, as part of this Project, Dudek has started this process by initiating contact with the NAHC and then local Tribes. Dudek requested a NAHC search of their Sacred Lands File (SLF) on June 21, 2017 for the proposed Project APE. The NAHC provided results on June 22, 2017. This search did not indicate the presence of Native American traditional cultural place(s) within this area (Confidential Appendix C). The NAHC additionally provided a list of Native American tribes and individuals/organizations that might have knowledge of cultural resources in or near the Project APE.

Following the NAHC response, on June 22, 2017, letters were sent to the listed tribal representatives with the intent of requesting information, opinions or concerns relating to the proposed Project impacts (Confidential Appendix C). These letters contained a brief description of the planned Project, reference maps, and a summary of the NAHC SLF and SCIC search results.

To date, four tribal responses have been received by Dudek concerning the Project. On June 27, 2017 the Viejas Tribal Government responded and requested that a Kumeyaay Cultural monitor be present and they be informed of Project progression. On June 30, 2017, the Mesa Grande Band of Mission Indians responded that the Project is located within their Tribal Traditional Use Areas and therefore would like to be notified prior to any additional cultural studies or ground disturbing activities associated with the Project. On July 07, 2017, the San Pasqual Economic Development Agency (SPEDA) responded requesting that they also be informed of additional cultural surveys, excavations and/or monitoring. On July 13, 2017, Chris Devers, Cultural Liaison, for the Pauma Band of Luiseno Indians emailed Dudek, commenting that they were unaware of any specific concerns on the property, but they would like any project specific documentation concerning the project as it proceeds. All tribal responses are included in Appendix C (Confidential Appendix C).

No further information regarding Tribal Cultural Resources or other tribal concerns have since been provided.

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3 SURVEY METHODS

The current cultural survey methods can be classified as an intensive pedestrian survey. Archaeological survey staff exceeded the applicable Secretary of Interior Professional Qualifications Standards for archaeological survey and evaluation. The Project APE was subject to a 100% survey with transects spaced no more than 15 m apart and oriented in cardinal directions. All cultural resources identified through the records search and during the survey were recorded using a Global Positioning System (GPS) receiver with sub-meter accuracy, recording, at a minimum, the horizontal extents of the resource (i.e., site boundary), a sample of surface artifacts, cultural features, and any notable landform features within or adjacent to the site limits. Evidence for buried cultural deposits was opportunistically sought through inspection of natural or artificial erosion exposures and the spoils from rodent burrows. No artifacts were collected during the survey. Field recording and photo documentation of artifacts, as appropriate, was completed.

Documentation of cultural resources was compiled using the Office of Historic Preservation (OHP) and Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-44740), and the California Office of Historic Preservation Planning Bulletin Number 4(a), December 1989, Archaeological Resource Management Reports (ARMR): Recommended Contents and Format (ARMR Guidelines) for the Preparation and Review of Archaeological Reports. A Native American monitor was present for the intensive survey of the proposed Project APE. All prehistoric and historic resources identified during this inventory were recorded on California Department of Parks and Recreation Form DPR 523 (Series 1/95), using the Instructions for Recording Historical Resources (Office of Historic Preservation 1995). All DPR forms and updates generated during this Project are included as Appendix E (Confidential Appendix E).

During the recent survey, moderate, low-laying vegetation moderately obscured portions the ground surface throughout the Project APE. However, considering the entire APE, the ground surface visibility was approximately 50-75 percent; there were areas with both openly visible ground surface as well as vegetation-obscured ground surface. While ground covering vegetation was a consideration for potential surface visibility, it was noted that all of the parcels surveyed for this Project have been impacted by a moderate to high level of previous disturbances from residential development and occupation of the various residential parcels within the Project APE. Off-site impacts for the water line were not surveyed, as the water line will be placed within paved access ways right-of-way of Camino Del Mar.

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4 SURVEY RESULTS

During the current survey of the Project APE, two previously recorded sites were relocated (CA-SDI-7979 and CA-SDI-10940). These resources are discussed in more detail individually below and are depicted on Figure 4 in Confidential Appendix A.

4.1 Disturbances

The majority of the area within the proposed Project APE has been subjected to past impacts. Currently, intact buildings (such as the residential house), irregular surface topography, push-piles of sediments, plow scars, graded areas, irrigation pipes, synthetic ground cloth fragments, plastic, and the presence of other debris are all evidence for these disturbances. Aerial imagery available for the area from 1953 to 2013 illustrates the extent and volume of the early agricultural and then residential development producing disturbances within the Project APE (Figures D-01 to D-07, Appendix D).

The initial aerial image available of the Project APE is from 1953 and already shows multiple structures and landscaping altering the natural landscape in parcels 298-241-07, -29, -34, -35, -36 and portions of 299-030-15 (Figure D-01, Appendix D). In the 1953 image, in the northern portion of the Project APE, parcels 298-241-29, -34, -35, and -36 have structures that appear to be residential and possibly agricultural, as the image demonstrates small rows of disturbances that are consistent with agricultural landscaping. Parcel 298-241-06 is undeveloped at this time but has a landscape consistent with parcels 298-241-35, and -36, which appear to be clear cut and possibly graded. In the 1953 aerial image parcel 298-241-07 has a clearly established private residence, while the small triangular parcel 299-030-14 is undeveloped. The southernmost parcel included in the current Project's APE, APN 299-030-15, has in the 1953 image, a standing structure, most likely a private residence, on a portion of the southern edge of the parcel (Figure D-01, Appendix D).

Aerial images from 1964 to 1967 (Figures D-02 and D-03, Appendix D) demonstrate a period where no new development occurred and it appears that the residence near the southern portion of the Project APE has been abandoned and unoccupied for some time prior to the 1967 image. The next available aerial image of the Project APE comes from 1980 and a number of changes can be noted from the image. First, the structure at the most southern portion of the Project has now been destroyed and completely removed. Second, the currently standing residential structure at parcel 299-030-15 is under construction. Parcel 298-241-06 has been relatively untouched and heavily overgrown with vegetation by 1980 and there are signs suggesting that the structures at the northern end of the Project APE have been less utilized and possibly abandoned as well. Vegetation surrounding the residential structures on parcel 298-241-34, -35, and -36 has grown unchecked, and the once straight-lined dirt roads have become blown out and diffuse, suggesting disuse of the general area (Figure D-04, Appendix D).

Ten years later, the 1990 aerial image demonstrates the continued trend first noted in the 1980's aerial image: the residences on parcels 298-241-07, and 299-030-15 are fully established and in habited, while parcel 298-241-06 remains unattended and overgrown. The most notable change can be seen in the northern parcels where the three structures that once stood there have been demolished and removed from the landscape. It appears from the 1990 aerial image that only two concrete pads remain of the former structures located here (Figure D-05, Appendix D).

The final two aerial images available are from 2003 and 2012, which demonstrate the same general trend seen from the 1980's to the 1990: residences located on parcels 299-030-07 and -16 are developed and occupied, and the rest of the parcels within the current Project's APE are unoccupied and unutilized. One interesting occurrence shows up in the final 2012 image. Parcel 298-241-06, which had largely been untouched since the late 1960s, by 2012 starts to show signs of development or minimally landscape maintenance; the thick vegetation has been cut back dramatically and something (unidentifiable from the aerial images) is occurring near the very western edge of the parcel, possibly construction of a temporary structure (Figures D-06 and D-07, Appendix D). What becomes immediately clear from the aerial image documentation is that all of the parcels included in this Project have been heavily disturbed by historic and modern-era residential activities. Because of the documented level of previous ground disturbance within the Project area, it will be important to determine if any resources identified in the APE are intact, in-situ sites that have potential significant subsurface deposits, or if the resources identified have been disturbed and secondarily deposited.

Aerial images were also reviewed for the second water line alignment. The earliest image in 1953 shows a disturbed landscape. A railroad spur runs from east of Jimmy Durante Boulevard to the railroad line, in what is currently the alignment of the dirt and paved access route to the Public Works Yard. The land immediately south of that alignment is undeveloped, and remains so through the most recent images available (2016). To the north, the Public Works Yard was established by 1964 and expanded between 1967 and 1980 to its current size. To the west, 27th and 28th Streets are dirt alignments in 1953, with few structures in the area. By 1964 the streets are paved and the neighborhood is filled in with housing.

4.2 CA-SDI-7979

CA-SDI-7979 consists of a prehistoric habitation/midden site that included a wide range of artifacts and tools, initially recorded in 1980, long after the property had been agriculturally and residentially developed. CA-SDI-7979 was initially tested by RECON Inc. in 1995. A subsequent data recovery program, designed with approval of the City of Del Mar to mitigate adverse impacts to the site, was conducted by Brian F. Smith and Associates (BFSA) in 1996. From the conditions identified during the current survey, it appears that this parcel has not been touched or further developed (with the exception of mowing tall grass) since the data recovery program in 1996 was concluded. A copy of the report of the BSF 1996 excavations authored by Kirkish and Smith in 1997 is available in Appendix B.

During the current survey, the site was found to be in the same general condition as previously recorded. Cultural materials (such as fragments of marine invertebrate shell and flakedstone artifacts) were identified on the ground surface within the approximate previously recorded boundaries. Furthermore, despite a significant amount of time passing since the last cultural work conducted, and considering the volume of recovery removed from excavations conducted at this site, artifacts and cultural materials were still identified on the ground surface. Artifacts identified during the current survey included volcanic flakes and debitage; while marine invertebrate species identified included *Argopecten*, *Chione* and possibly *Ostrea* fragments. The data recovery efforts recovered a sufficient sample from the site and, as stated in that report, have mitigated potential impacts from grading to the site. No further excavation or documentation efforts are necessary. Consistent with the City's previous requirements, archaeological and Native American monitors should be present during ground disturbing activities in case new features or site components are identified.

4.3 CA-SDI-10940

During the survey of the southern parcel of the Project APE, the northern portion of site SDI-10940 was identified as scatter of artifacts and marine shell located along the southern portion of the terrace adjacent to the south side of the existing residential driveway. Scattered flakes, flake tools, and fragments of marine shell (*Argopecten* sp. and *Chione* sp.) were observed over a 50-x-40-m area. Some shell was noted to be embedded within the ground surface; however, this may be a result of erosional processes. The northern end of the scatter had a noticeably higher volume of material, with artifacts and shell fragments becoming more diffuse to the south. Artifacts and marine shell fragments are extremely sparse on the ground surface in the vicinity of the standing residential structure. From records of previous archaeological investigations at this site it is apparent that the lithic artifacts and shell identified in this location currently represent the resource Malcom Rogers recorded as W-34A, and also represent the general vicinity of all of Cheever's 1995 positive STPs and sample units (Cheever 1995). Before subsurface testing was conducted it was not known if the shell and artifacts identified at this time represent a secondary deposit resulting from residential development of the property. Furthermore, Cheever stated this site had been previously capped with sterile dirt, as a preservation measure. However, the presence of dirt berms incorporated into the surrounding landscape could suggest that the preservative cap might have since been displaced, exposing intact cultural deposits. While Dudek's current cultural work did not extend to the parcels south of 299-030-15, the 1995 Cheever excavations and Malcom Roger's 1929 excavations clearly demonstrate that site SDI-10940 extends south, outside the current project area.

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5 EXTENDED PHASE I SUBSURFACE SURVEY

Dudek completed an extended phase I (XPI) subsurface survey of site CA-SDI-10940 on November 03, 2017. Dudek archaeologists completed three shovel test pits (STP's), two 10 cm diameter auger test pits, and a surface collection at SDI-10940 (Figure 5, Confidential Appendix A). Native American monitor Justin Linton, representing Red Tail, was present for all subsurface testing excavations conducted during the Phase I excavations.

5.1 Extended Phase I Methodology

The XPI subsurface survey followed standard archaeological procedures and techniques that meet the Secretary of Interior's standards and guidelines for archaeological excavation. Three STPs were placed judgmentally and excavated across the site in an attempt to determine the possibility of subsurface deposits. The STPs were placed within an area that was identified as the densest area of surface artifacts associated with SDI-10940 during the initial pedestrian survey. All excavations were recorded on standard STP excavation forms, photographed, and mapped with a Trimble Global Positioning System (GPS) unit. STPs measured 50 x 25 cm and were typically excavated in 20 cm arbitrary levels and excavated to a minimum depth of two sterile levels, or until physical limitations were encountered. All sediments were screened using a standard shaker-screen with 3 mm wire screen mesh. Materials recovered from the STPs were counted, recorded, collected, and then brought back to the Dudek laboratory to be cleaned and processed. A surface artifact inventory was conducted of the densest area of surface materials, which consisted of recording, counting, and photographing all materials noted on the surface; however a general collection was not made of non-diagnostic artifacts. All notes and images related to the current study are kept on digital file at the Dudek Encinitas office.

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6 EXTENDED PHASE I RESULTS

6.1.1 Unit Sediment Profiles

Three STPs measuring 50 x 25 cm were placed judgmentally, on a roughly north-northeast-to-south-southwest diagonal line, approximately 15 m apart through the part of the terrace that had the highest density of surface artifacts and shell fragments (Figure 5, Confidential Appendix a). STPs 1 and 2 had a similar stratigraphic profile and both had evidence of an intact deflated shell midden deposit approximately 30 to 60 mcm below the surface (cmbs). The stratigraphy encountered in STPs 1 and 2 consisted of a very dark brown (Munsell: 10YR3/2) loosely compact slightly silty-sandy loam with consistent, moderate volume of marine invertebrate shell fragments extending down from the ground surface to approximately 30 cmbs. From approximately 30 to 60 cmbs a tightly compacted deposit of marine invertebrate shells and fragments embedded into a matrix of compact brown (Munsell: 10YR4/3) sandy loam was encountered. STPs 1 and 2 were excavated to an approximate depth around 70 cmbs and then a 3" bucket auger was used to excavate further due to the increasing compactness of sediments encountered. Sediments encountered from approximately 70 cmbs down to a depth of approximately 120 cmbs in the auger consisted of a very compact brown (Munsell: 7.5YR5/3) sandy loam with small friable fragments of marine invertebrate shell remains. Sediments encountered at approximately 120 to 140 cmbs consist of a slightly less compact reddish brown (Munsell: 5YR5/4) sandy loam, most likely sandstone formation. STP/augers 1 and 2 were both terminated at an approximate depth around 140 cmbs.

STP 3 was positive, in that it yielded small fragments of marine shell invertebrate remains, but the intact shell deposit identified in STPs 1 and 2, was not encountered. Instead, only a lighter volume of marine invertebrate fragments was encountered during entire excavation of STP 3, a volume similar to the amounts of shell fragments that were encountered below 60 cmbs in STPs 1 and 2. The sediment profile identified in STP 3 consisted of loosely compact brown (Munsell: 10YR4/3) sandy loam down to approximately 30 cmbs, which transitioned into a very compact brown (Munsell: 7.5YR5/3) with small friable fragments of marine invertebrate shell remains. Sediments encountered at approximately 100 to 110 cmbs consist of a compact reddish brown (Munsell: 5YR5/4) sandy loam, most likely sandstone formation. STP/auger 3 and was terminated at an approximate depth around 110 cmbs.

With a limited amount of time and relatively compact sandy sediments encountered, an additional two auger test pits were excavated in an attempt to further delineate the extent of the subsurface shell deposit encountered in STPs 1 and 2. Auger 1 was placed judgmentally to the east of the line of STPs excavated, slightly north of STP 2, and immediately in between the property border fence and the artificially created dirt berms identified adjacent to the property fence.

The sediment profile encountered in Auger 1 consisted of loosely compact brown (Munsell: 10YR4/3) sandy loam from the ground surface down to approximately 50 cmbs, which transitioned into a very

compact brown (Munsell: 7.5YR5/3) sandy clay to a depth of 150 cmbs. Auger 1 terminated in a reddish brown (Munsell: 5YR5/4) coarse grain sandy clay with small friable fragments of marine invertebrate shell remains encountered to an approximate depth of 230 cmbs. It should be noted that Auger 1 was located less than 2 m from the top of the eastern edge of the landform where a steep slope drops off (to the east) to a maintained slope and City park area below (see Figure 5, Confidential Appendix A). The location of Auger 1 is important because the results of the test pit most likely reflect the physical location of the test pit rather than an example of a buried, intact cultural deposit.

Auger 2 was excavated approximately 15 m west of the line of STPs, immediately adjacent to the current paved driveway, within the manicured landscape of the standing residence. The sediment profile encountered in Auger 2 consisted of loosely compact brown (Munsell: 10YR4/3) sandy loam from the ground surface down to approximately 20 cmbs. Sediments encountered at 20 cmbs transitioned into a very compact brown (Munsell: 7.5YR5/3) sandy loam with a moderate amount of small friable marine shell invertebrate fragments extending down to approximately 90 cmbs. Sediment encountered from 90 to 120 cmbs became a reddish brown (Munsell: 5YR5/4) compact sand, with a low volume of small friable fragments of marine invertebrate remains. No shell fragments were encountered in the sandy sediments from 110 to 140 cmbs. Auger 2 was terminated at an approximate depth of 140 cmbs.

6.1.2 Artifact Recovery

A total of 2,880 items were recovered during the XP I excavation of site CA-SDI-10940. These cultural materials included marine shell invertebrate fragments with a total weight of 1,582 grams, one rodent bone, one volcanic multi-directional core, one quartzite hammerstone fragment, 27 pieces of volcanic flakedstone debitage, 13 fragments of fire-affected-rock (FAR), and 6 modern/intrusive items which include one fragment of glass, two quarters, and three pennies. A general surface collection was completed across the area where observable cultural materials were identified and two flakedstone tools were GPS point recorded and collected. These artifacts include one reddish-orange colored quartzite percussion tool/hammerstone fragment and one multi-directional gray-green volcanic core. Both artifacts have been fire affected as demonstrated by the clear discoloration evidence of having been exposed to fire. An additional eight flakes were collected as a general sample of the materials scattered on the ground surface, including three primary coarse-grained gray-green colored volcanic flakes, two secondary coarse-grained gray-green colored volcanic flakes, and three interior coarse-grained gray-green colored volcanic flakes.

The excavation of STP 1 recovered a total of 1,429 marine invertebrate shell fragments, six volcanic flakes, and seven fragments of FAR. A total of 142 shell fragments and two volcanic flakes were recovered from 0 (ground surface) to 20 cmbs; 605 shell fragments, two volcanic flakes and seven fragments of FAR were recovered from 20 to 40 cmbs; 670 shell fragments and two flakes were recovered from 40 to 60 cmbs, and 12 small shell fragments were collected from the auger excavation from 60 to 110 cmbs within STP 1.

The excavation of STP 2 recovered 1,181 marine invertebrate shell fragments, one rodent bone, six volcanic flakes, six fragments of FAR, one fragment of clear glass, two U.S. quarters (bicentennial "Drummer Boy" quarters), and three U.S. pennies (dated 1963, 1975, and 1976). Cultural material recovered by excavation level included: 96 shell fragments, three volcanic flakes, one FAR fragment, one clear glass fragment, and five coins from 0 to 20 cmbs; 549 shell fragments and three fragments of FAR from 20 to 40 cmbs; 487 shell fragments, three flakes and two fragments of FAR from 40 to 60 cmbs; and 50 small shell fragments were collected from the auger excavation from 60 to 120 cmbs.

The excavation of STP 3 recovered a total of 57 marine invertebrate shell fragments and six volcanic flakes. Cultural material recovered by excavation level included: 17 shell fragments and two volcanic flakes from 0 to 20 cmbs; 12 shell fragments and two volcanic flakes from 20 to 40 cmbs; 11 shell fragments from 40 to 60 cmbs; 10 shell fragments and two volcanic flakes from 60 to 80 cmbs; and a seven small shell fragments were collected from the auger excavation from 80 to 120 cmbs within STP 3.

The excavation of Auger 1 yielded 153 shell fragments and two volcanic flakes which were recovered from the ground surface to a terminal depth of approximately 230 cmbs. The excavation of Auger 2 yielded only 11 shell fragments recovered from the ground surface to a depth of 120 cmbs.

Before the extended testing was completed, a surface collection was conducted which identified two tools (A1 and A2), three primary volcanic flakes, two secondary volcanic flakes, and three interior volcanic flakes. Artifact A1 is a fire-affected, multi-directional volcanic core. Artifact A2, located immediately adjacent to the eastern property edge consists of a quartzite Percussion/hammerstone fragment.

6.1.3 Artifacts and Species Identified

By a large margin, marine invertebrate shell fragments consisted of the bulk of the total materials recovered (n=2,831, or 78.57% of the total). Flakedstone artifacts constitute the second highest volume of material recovered (n=28, or approximately 14% of the total of all materials collected). The breakdown of the non-faunal (Shell and/or bone) artifacts recovered is demonstrated in Table 3.

Table 3
Artifacts Recovered form SDI-10940

Artifacts (non-faunal) recovered from SDI-10490	# of Total	% of Total
Flaked Stone	**28**	**58**
Core	1	02
Debitage	27	56
Percussing Tool	**1**	**02**

Table 3
Artifacts Recovered form SDI-10940

Artifacts (non-faunal) recovered from SDI-10490	# of Total	% of Total
Hammerstone	1	02
Misc.	**13**	**27**
Fire-Affected Rock	13	27
Modern Item	**6**	**13**
Coins	5	11
Glass	1	02
Grand Total	**48**	**100%**

The flakedstone recovered from CA-SDI-10940 consist of mainly volcanic flakes and demonstrate a rather even distribution of flake types with relatively equal numbers of primary, secondary, and interior flakes. While a majority of flakes identified are relatively large, bulky, and appear to represent reduction of larger items, several smaller thinning flakes were also identified, thus suggesting a possible wide range of lithic reduction activities, from breaking down larger cores to the refinement of already formed tools, or re-sharpening/re-shaping. The quartzite hammerstone fragment demonstrates clear evidence of peaking/wear damage on the intact end of the artifact and, as mentioned before, shows signs of being fire-affected.

Identified invertebrate species recovered from the subsurface deposit at CA-SDI-10940 include several species of barnacle, bean clams (*Donax gouldii*), Chama, Chione, Chiton, various crustacean species fragments, Jewelry Box (*Pseudochama*), various Limpet (*Lottia*) species, Mussel (Mytilus), several Oyster species (*Ostrea*), Razor Clam (*Siliqua patula*), Scallops (*Argopecten*), Tegula, Washington Clam (*Saxidomus*), Wavy Turbin (*Megastrea undosa*), Whelk, and several species of various marine snails. The highest volume of a specific identified species was Chione, comprising roughly 10% of the invertebrate species identified, with *Argopecten* comprising roughly 9% of the collection, and *Mytilus* comprising roughly 8% of the entire invertebrate collection.

Although the recovered assemblage recovered at this time lacks diagnostic artifacts or a wide variety of artifacts, it does confirm that the deposit is both cultural in nature (i.e., is not a natural deposit), and is the same intact deposit as identified by Cheever (1995), as it is contains similar materials, is in the same location and does not contain evidence of being redeposited.

7 SUMMARY AND RECOMMENDATIONS

7.1 Impacts

Two archaeological resources were identified in the project APE: CA-SDI-7979 and CA-SDI-10940.

CA-SDI-7979 is a prehistoric site that was previously recommended eligible for CRHR listing under Criterion 4 (scientific research value) and subject to a data recovery program to mitigate significant impacts (Kirkish and Smith 1997). The data recovery was sufficient to mitigate significant impacts to the site and no new or different impacts were identified during the current inventory. As such, the current project will not have a significant impact on CA-SDI-7979.

CA-SDI-10940 is a prehistoric site that has been recommended eligible on under all significance criteria due to its association with the Del Mar Man Site controversy, which was an important methodological discourse in anthropology (events and persons important in history). Its rich midden deposit made it significant under Criterion 4. The current study relocated the northern portion of the site and conducted an XPI subsurface survey in the area identified by Cheever (1995) as having intact significant deposits. While it could not be confirmed by Dudek during the current investigations, the previous studies of CA-SDI-10940 demonstrate that this site extends outside and beyond the current project boundaries. Dudek only identified a remnant portion of this significant deposit contained in an area depicted on Figure 5 (Confidential Appendix A). Dudek confirmed the significance of the remnant deposit under Criterion 4 for scientific research value but no deposits were located that could spatially link it to the area associated with the Del Mar Man controversy. Therefore, no information was obtained that could support a recommendation of significance under CEQA criteria 1-3. Implementation of the current project would have a significant impact on CA-SDI-10940. Furthermore, as site SDI-10940 extends beyond the current project APE to the south, any alteration or expansion of the APE in this area would require additional cultural investigations.

Avoidance of significant impacts to identified archaeological deposits from CA-SDI-10940 within the APE is the preferred treatment for cultural resources under CEQA. If avoidance is not feasible, a focused data recovery program should be implemented to mitigate significant impacts to the remnant and affected portions of CA-SDI-10940, according to the CEQA Guidelines. A research design and data recovery plan should be prepared to guide data recovery, taking into account finalized construction plans and other concerns in order to better define impacted areas. The data recovery program should be completed prior to project-related earth moving in the vicinity of CA-SDI-10940. A Secretary of the Interior qualified archaeological principal investigator should prepare the research design and work plan in consultation with the project proponent and consulting tribal representative (Red Tail), after refinement of the project design.

Moreover, archaeological and Native American monitoring is recommended during all ground-disturbing activities within the current project APE to appropriately treat any unanticipated discoveries.

Dudek recommends that if associated restoration or other construction activities occur in areas outside the planned development area, such as in the North Bluff Preserve, the need for cultural monitoring would be dependent on the types and level of disturbance planned in such areas. Typically, if ground surface disturbance is limited to excavations less than 12 by 12 inches, and none of the sediments are being removed from the area, then full time cultural monitoring will not be necessary. However, since a known prehistoric site, CA-SDI-10,940 has been identified in the Northern Bluff Area, outside of the current Project APE; a professional archaeologist should do an inspection of ground surface in the locations of the disturbances to determine the level of monitoring effort required during those ground disturbing activities.

The proposed off-site impacts related to water line installation are in previously developed areas that have undergone grading for installation of streets, railroad spurs, and other developments. Terraces adjacent to lagoons in coastal California, and especially in San Diego County, were occupied extensively by Native Americans over the last 10,000 years, as demonstrated by the two sites in the APE, as documented in this report. The second alternative is located within 100 feet of a known site, on a lower slope of one such terrace, and was reported as a potential village site (CA-SDI-192). Although there is little information on the site, its proximity to the proposed water line alignment indicates that this area is highly sensitive for archaeological resources. As such, monitoring is recommended for the second water line alignment, even though prior disturbances in the area likely impacted some or all of any such resources. .

Unanticipated Discovery of Human Remains

In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are found, the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the remains are determined to be Native American, the Coroner shall notify the NAHC in Sacramento within 24 hours. In accordance with California Public Resources Code, Section 5097.98, the NAHC must immediately notify those persons it believes to be the most likely descended (MLD) from the deceased Native American. The MLD shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

8 REFERENCES

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APPENDIX A (CONFIDENTIAL)

Project APE Cultural Resources Maps

SOURCE: SANGIS 2017

FIGURE 4

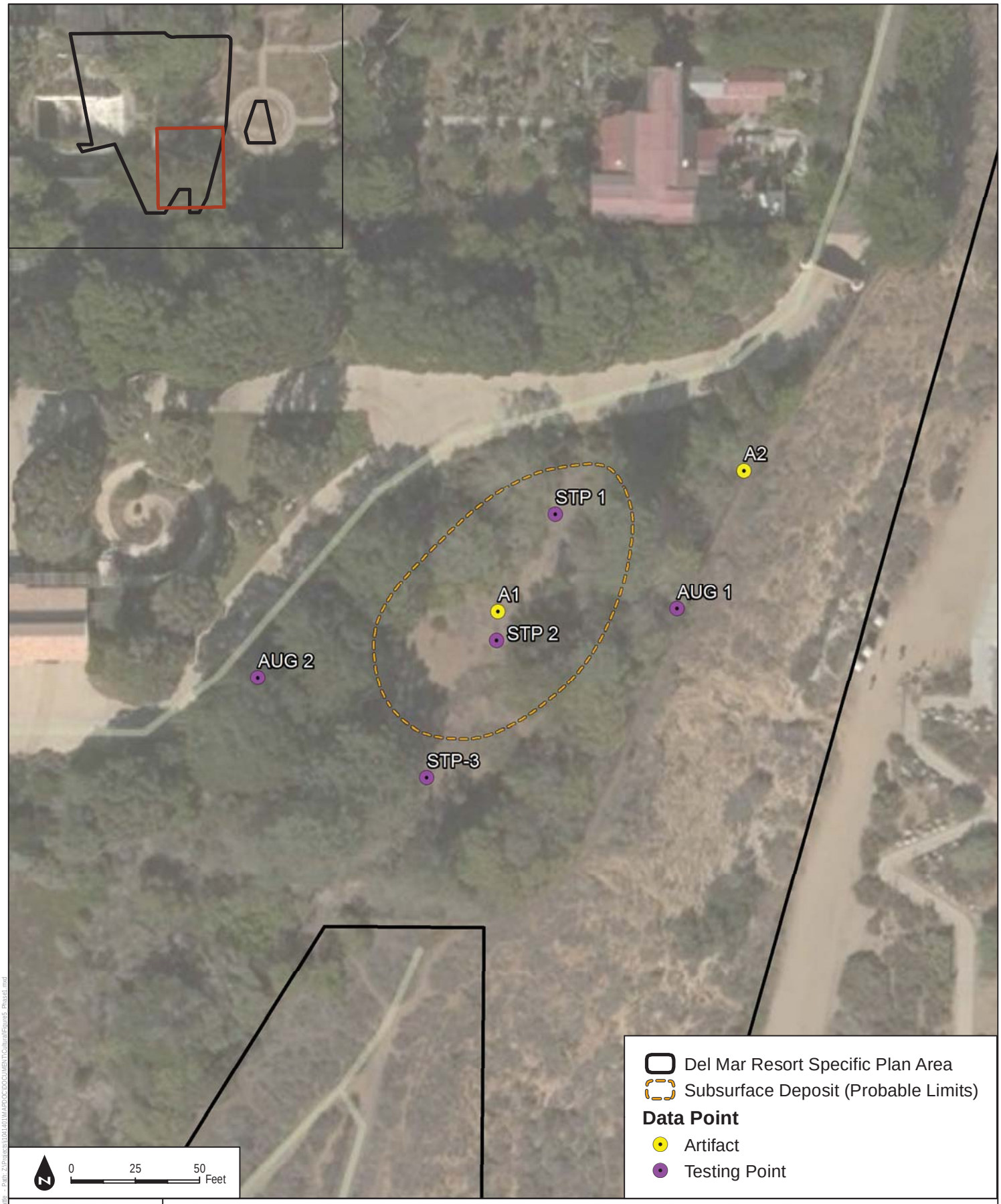
Current Survey Resource Map

DUDEK

Cultural Resources Survey Report

Del Mar Resort Project

Date: 6/26/2019 - Last saved by: cbattle - Path: Z:\Projects\1041401\MAPDOC\DOCUMENT\Cultural\Figure4_CurrentResources.mxd



SOURCE: SANGIS 2017

FIGURE 5

SDI-10940 Extended Phase 1 Testing Map

DUDEK

APPENDIX B (CONFIDENTIAL)

SCIC Records Search Results

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM RECORDS SEARCH

Performed by Dudek with Permission from SCIC

Company Representative: Scott Wolf

Date Processed: June 19, 2017

Project Identification: Del Mar Resort Cultural Survey PN 10414

Search Radius: 1-mile

Historical Resources: YES

Trinomial and Primary site maps have been reviewed. All sites within the project boundaries and the specified radius of the project area have been plotted. Copies of the site record forms have been included for all recorded sites.

Previous Survey Report Boundaries: YES

Project boundary maps have been reviewed. National Archaeological Database (NADB) citations for reports within the project boundaries and within the specified radius of the project area have been included.

Historic Addresses: YES

A map and database of historic properties (formerly Geofinder) has been included.

Historic Maps: YES

The historic maps on file at the South Coastal Information Center have been reviewed, and copies have been included.

Summary of CHRIS IC Records Search Elements	
RUSH:	No
Spatial Features:	87
PDFs:	11
PDF Pages:	2009

Dudek has retained a subscription to data held at the South Coastal Information Center (SCIC) for San Diego County. As part of this subscription, Dudek is approved to perform records searches for this area.

South Coastal Information Center
San Diego State University
5500 Campanile Drive
San Diego, CA 92182-5320
Office: (619) 594-5682
www.scic.org
scic@mail.sdsu.edu

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM
PHOTOCOPY/ FAX/ AERIAL PHOTO REQUEST

Company: Dudek

Company Representative: Scott Wolf

Date Processed: 6/22/2017

Project Identification: PN 10414 - Del Mar Resprt Cultural Survey

Pages Photocopied: 2009

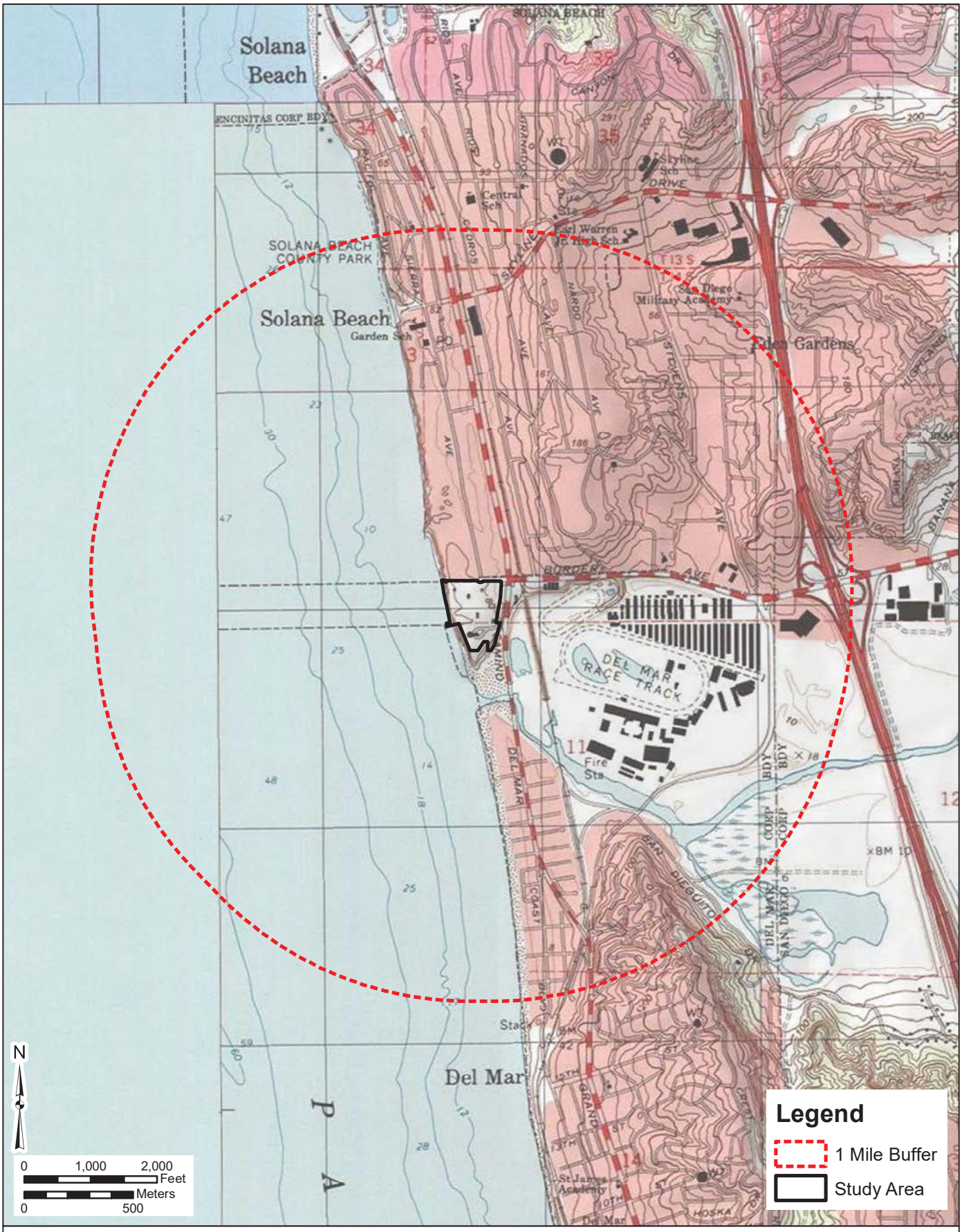
Pages Faxed: 0

Aerial Photos: 0

Hours: 3

Employee Name: JL **RUSH:** no

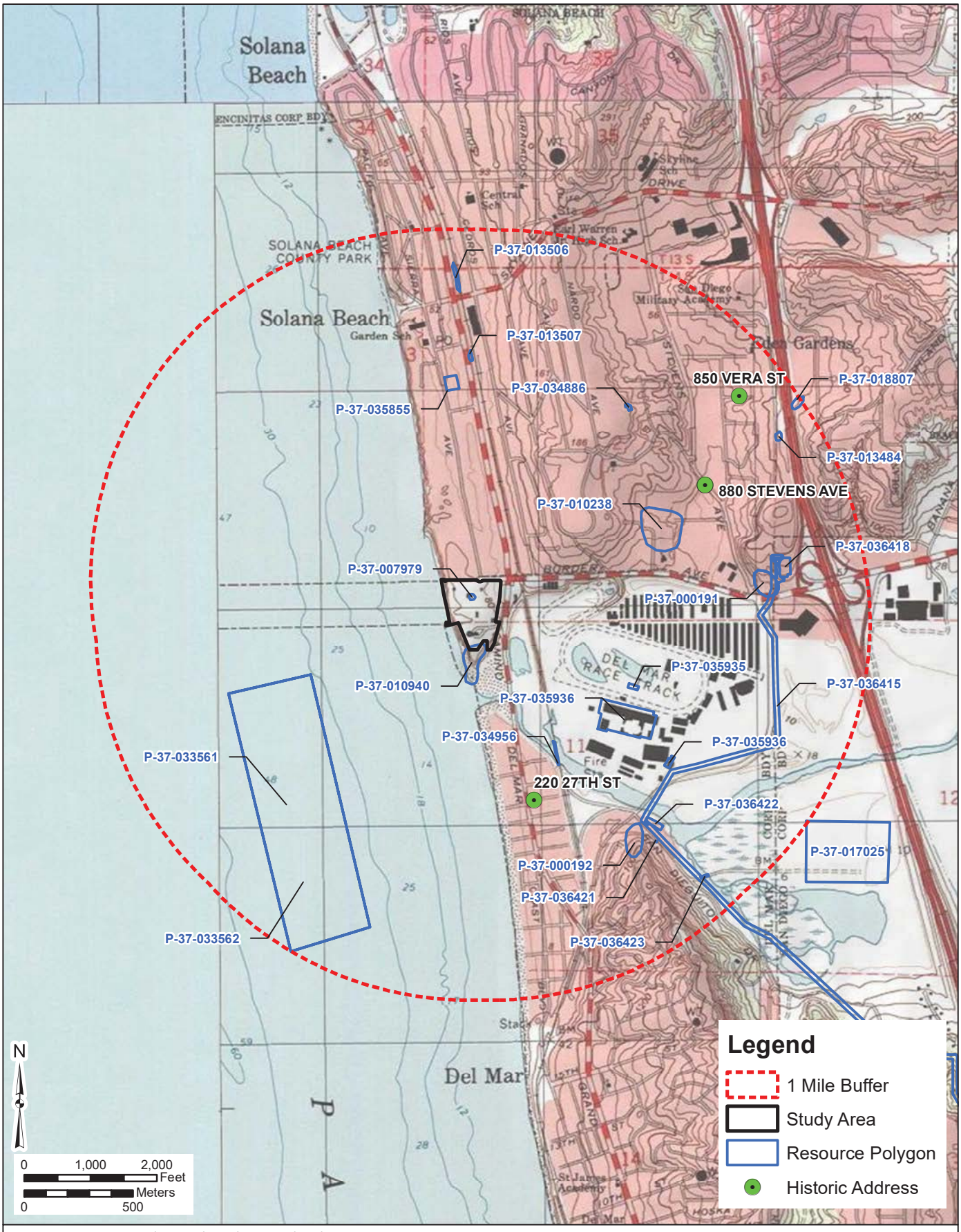
This is not an invoice. Please pay from the monthly billing statement



SOURCE: USGS 7.5-Minute Series Del Mar Quadrangle
Township 13S, 14S; Range 4W; Sections 1, 2, 3, 11, 12, 14, 34, 35

Records Search Map

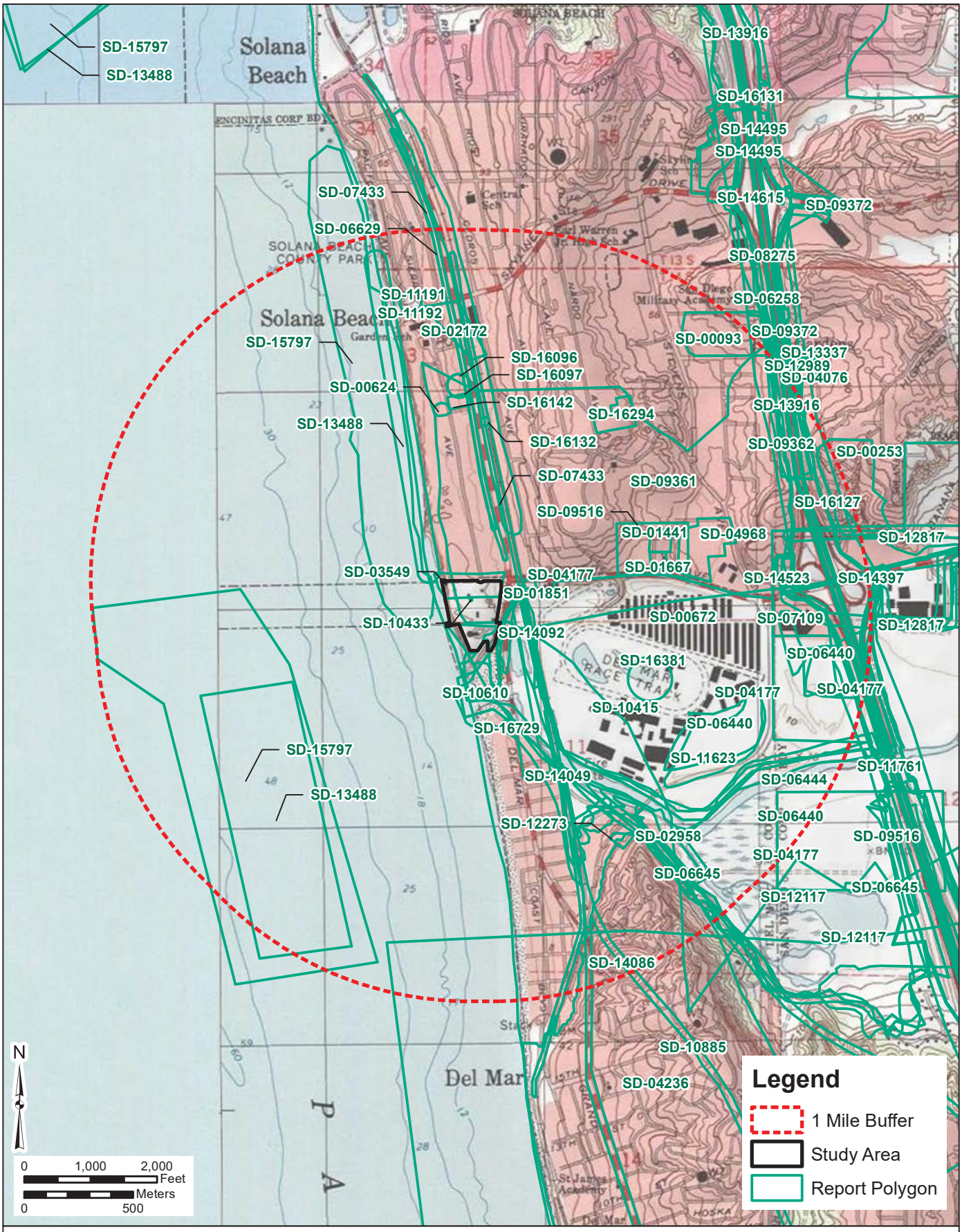
Del Mar Resort Project



SOURCE: USGS 7.5-Minute Series Del Mar Quadrangle
Township 13S, 14S; Range 4W; Sections 1, 2, 3, 11, 12, 14, 34, 35

Records Search Map - Resources

Del Mar Resort Project



SOURCE: USGS 7.5-Minute Series Del Mar Quadrangle
Township 13S, 14S; Range 4W; Sections 1, 2, 3, 11, 12, 14, 34, 35

Records Search Map - Reports

Del Mar Resort Project

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # UPDATE
HRI #/Trinomial CA-SDI-7979

Page 1 of 1
Resource Identifier:

☐ Continuation ☒ Update

3. UTM Coordinates: Zone 11/474820 Easting/3648880 Northing

7. Location: Site is located 100 meters southeast of the intersection of Border and Camino Del Mar.

9. Site Description: Moderately developed midden consisting of lithics and shellfish remains.

10. Area: 50 m (length) x 50 m (width), 2500 m^2. Method of Determination: Taped

11. Depth: 110 cm. Method of Determination: Subsurface testing

12. Features: None observed

13. Artifacts: Wide range of artifacts including groundstone tools, choppers, scrapers, hammerstones

14. Non-Artifactual Constitutents: Mammal bone and shellfish remains

20. Nearest Water (type, distance and direction): River, 1/2 mile, south

21. Largest Body of Water Within One Km. (type, distance, and direction): Pacific Ocean 100 meters west

24. Site Soil: Medium brown silty sand

25. Surrounding Soil: Same

26. Geology: marine and non-marine sediments

27. Landform: Marine-cut terrace

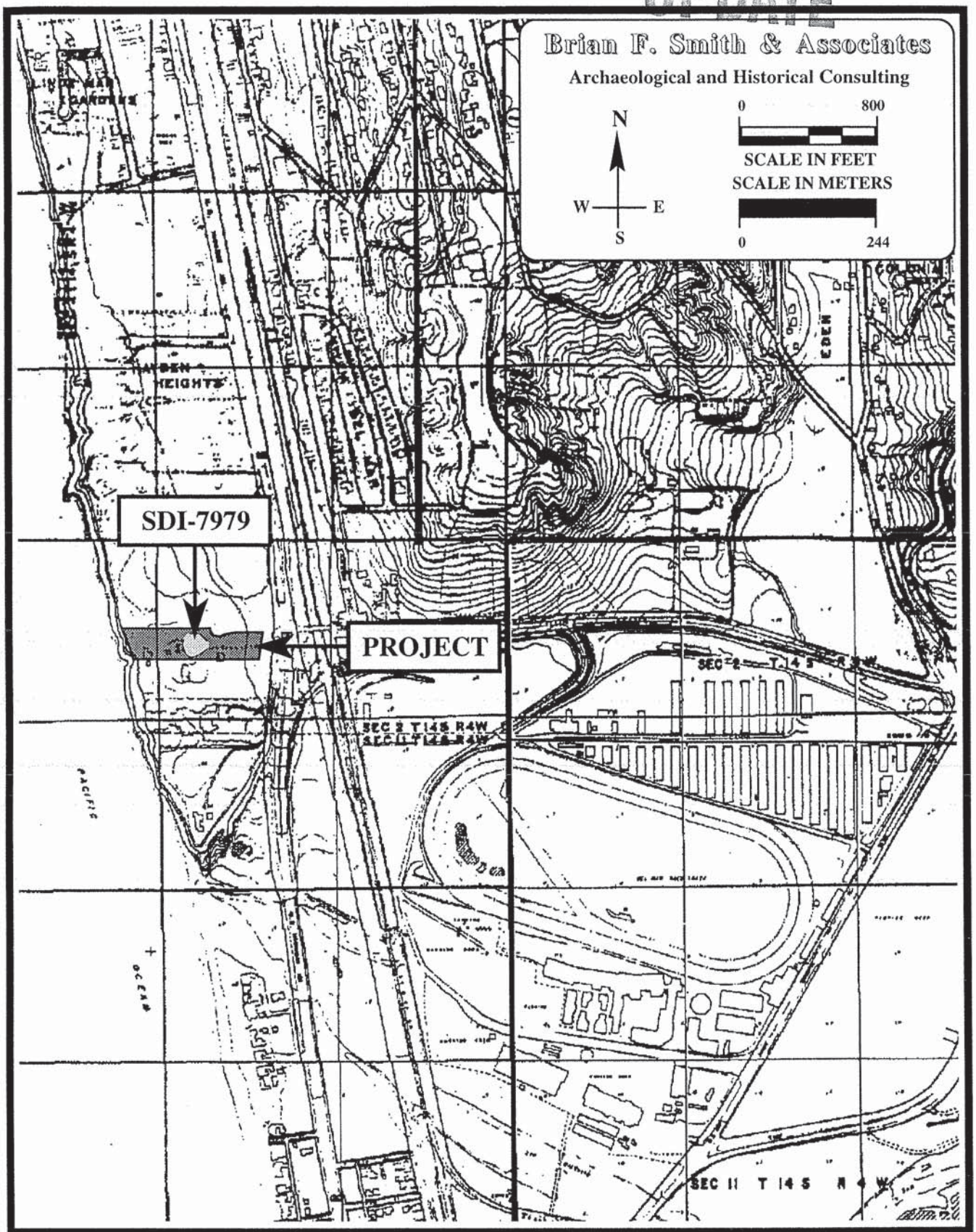
28. Slope: Level

29. Exposure: Open

34. Type of Investigation: A data recovery program was conducted to mitigate impact from an impending project. Subsurface investigation entailed the excavation of six mechanically excavated units, nine test units, and one trench. Subsurface recovery consisted of 1558 artifacts, 35,945.4 grams of shellfish, and 217 grams of bone.

Project: "Results of a Data Recovery Program at SDI-7979" (Smith 1996)
Submitted by: Brian F. Smith Date: January 22, 1996
Affiliation and Address: Brian F. Smith and Associates, 14678 Ibex Court, San Diego, CA 92129

UPDATE



RESOURCE LOCATION MAP

THE WHITTIER-DEL MAR PROJECT

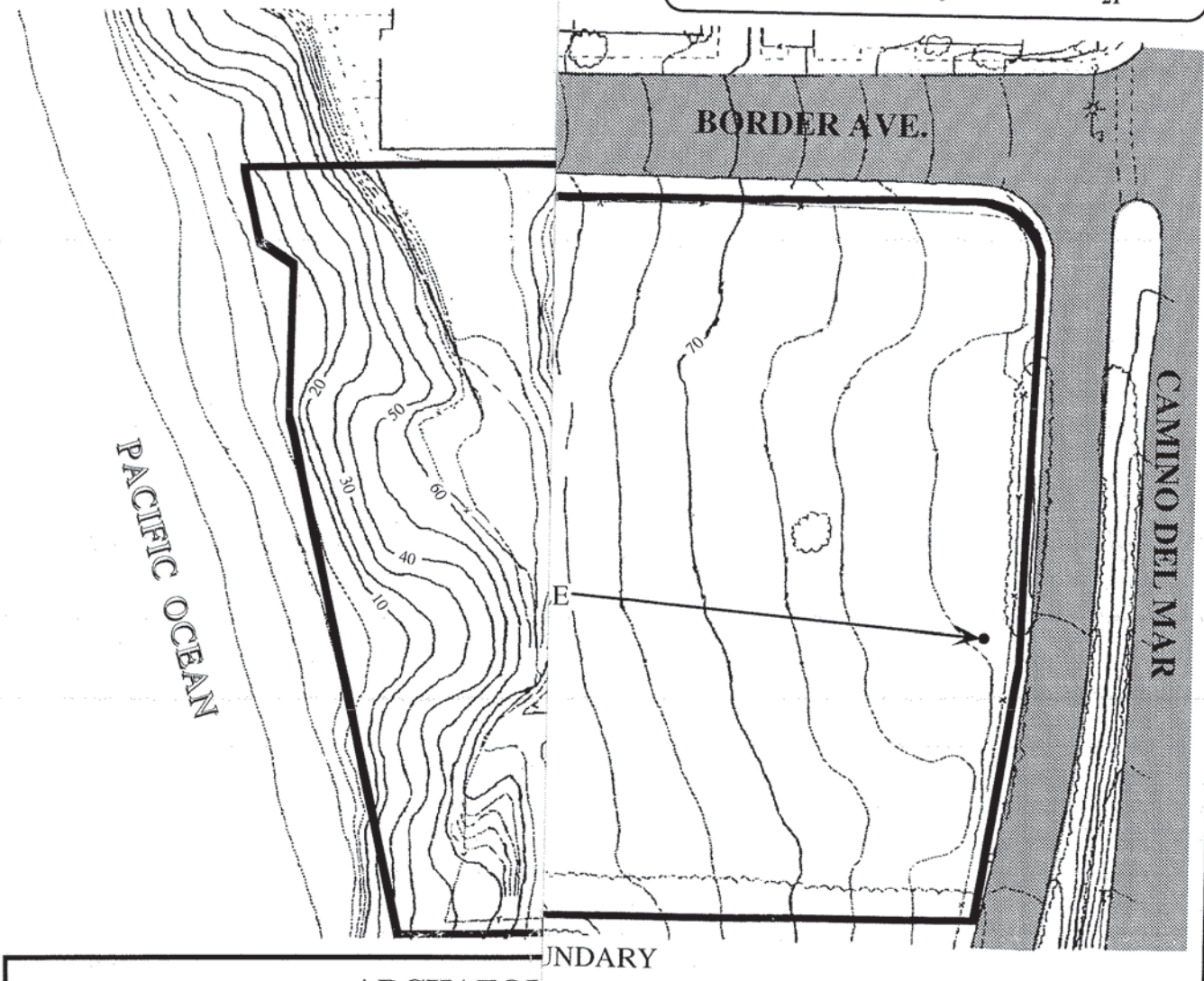
SHOWN ON THE CITY OF SAN DIEGO ENGINEERING AND DEVELOPMENT DEPARTMENT 800' SCALE MAP

UPDATE

Brian F. Smith & Associates
Archaeological and Historical Consulting

N
W E
S

0 70
SCALE IN FEET
SCALE IN METERS
0 21



UNDARY

ARCHAEOL

■ – MECHANICALLY EXCAVATED
■ – TEST UNIT LOCATION
⊠ – PREVIOUS TEST UNIT LOCATIO
⊙ – PREVIOUS SHOVEL TEST PIT (S
○ – PREVIOUS SHOVEL TEST PIT (S
▒ – TRENCH LOCATION
▪▪ – PREVIOUS FOUNDATION

TA RECOVERY MAP
SITE SDI-7979
THE WHITTIER-DEL MAR PROJECT

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
ARCHEOLOGICAL SITE SURVEY RECORD

SDi-7979

SITE No. W-2571

1. Previous Site Designation N/A 2. Temporary Field No. N/A
3. USGS Quad DEL MAR 7½' X 15' ___ Year ___
4. UTM Coordinates 11/474790/3648920
5. Twp. 14S Range 4W : SW ¼ of SW ¼ of Sec. 2
6. Location South of Border Ave, west of Camino del Mar (Hgt. 1) overlooking the ocean.
7. Contour 0-80 8. Owner & Address Unknown
9. Prehistoric X Ethnographic ___ Historic ___ 10. Site Description shell midden located between two house foundations (scheduled for demolition)
11. Area UNCERTAIN - PART MAYBE UNDER HOUSE x ___ meters, ___ square meters. 12. Depth of Midden ?
13. Site Vegetation Weeds/Grasses Surrounding Vegetation coastal
14. Location & Proximity of Water Pacific Ocean
15. Site Soil Sandy Surrounding Soil sandy
16. Previous Excavation probable because of road and houses.
17. Site Disturbance highly
18. Destruction Possibility imminent
19. Features ___
20. Burials none noted
21. Artifacts Shell: chione (smooth, rough, banded) bean clam, S.D. SCALLOPS, MANO FRAGMENT, LITHIC FLAKES (ANDESITE)
22. Faunal Remains one bone, probably horse or cow?
23. Comments The site surface is covered with dense vegetation (grass), was a horse corral(?) RODENT ACTIVITY
24. Accession No. N/A 25. Sketch Map ___ by ___ where ___
26. Date Recorded 3/25/80 27. Recorded By Diane Barbolla + Doyle Cheever
28. Photo Roll No. No Frame No. ___ Film Type(s) ___ Taken By ___

DPR 422 (Rev. 9/76)

% Destroyed 7 How _____ Test Excavated No %, if known.

National Register Status: Listed _____ Potential _____ No Determination _____ Nominated _____ Ineligible _____

State Historical Landmark (No.) _____ Point of Historical Interest _____

SPECIAL ATTRIBUTES (Place an X in only those spaces which pertain to the site)

Midden/Habitation Debris X (Lithic) and/or Ceramic Scatter X

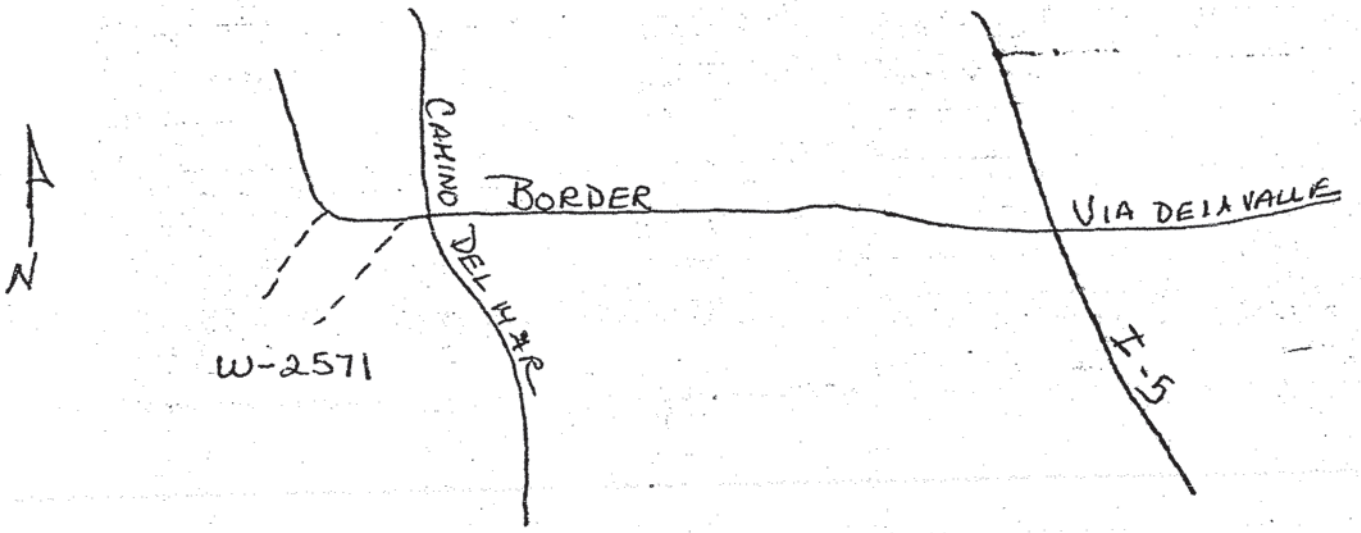
Bedrock Mortars/Milling Surfaces _____, Petroglyphs/Pictographs _____, Stone Features _____

Burials _____, Caches _____, Hearths/Roasting Pits _____, Housepits _____, Structure Remains _____,

Underwater _____, Open Air X, Rockshelter _____, Cave _____, Quarry _____, Trails _____

REMARKS _____

SKETCH LOCATION MAP (Include permanent reference markers, North Arrow, and Scale)

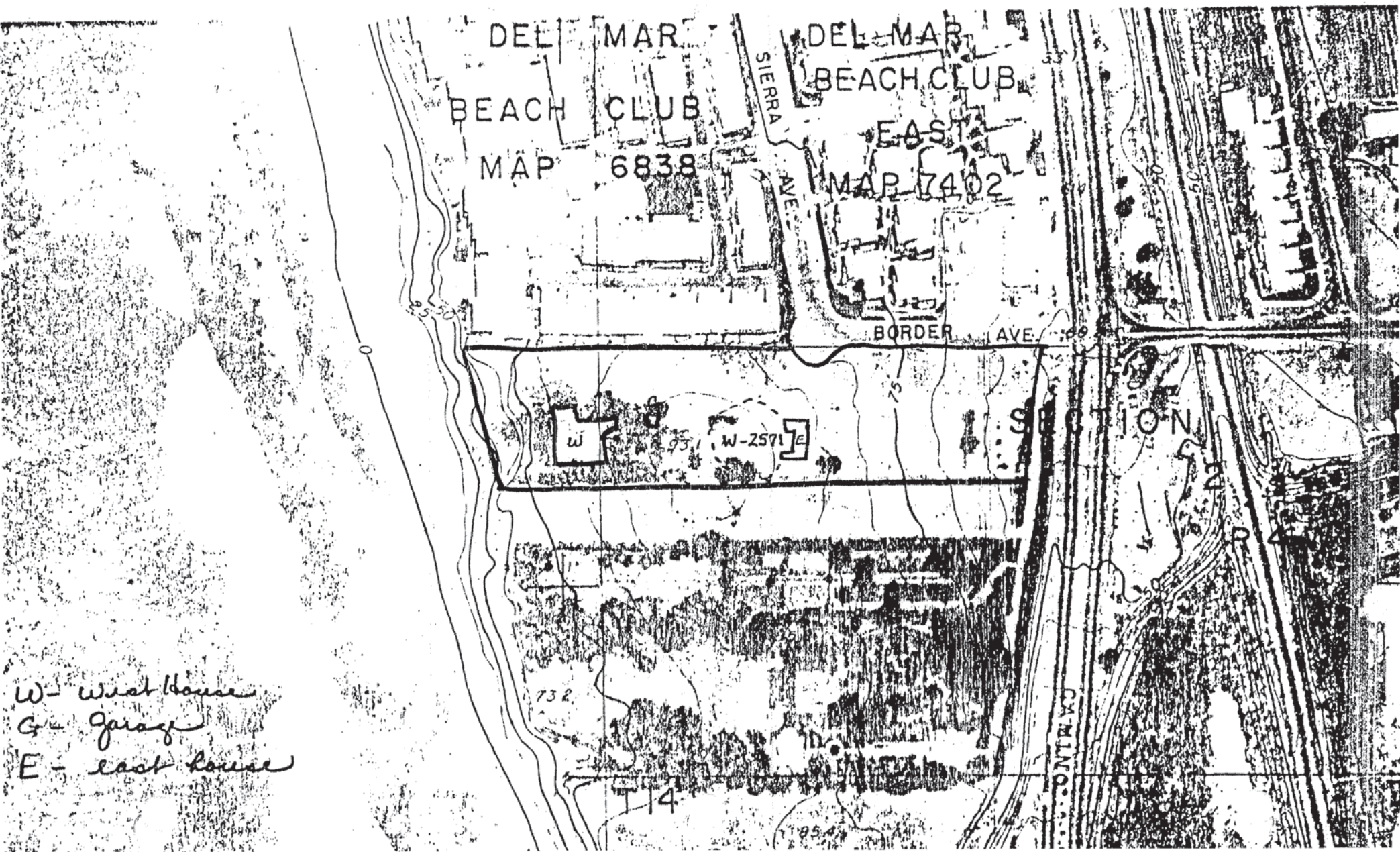


SKETCH SITE MAP (Same criteria as above)

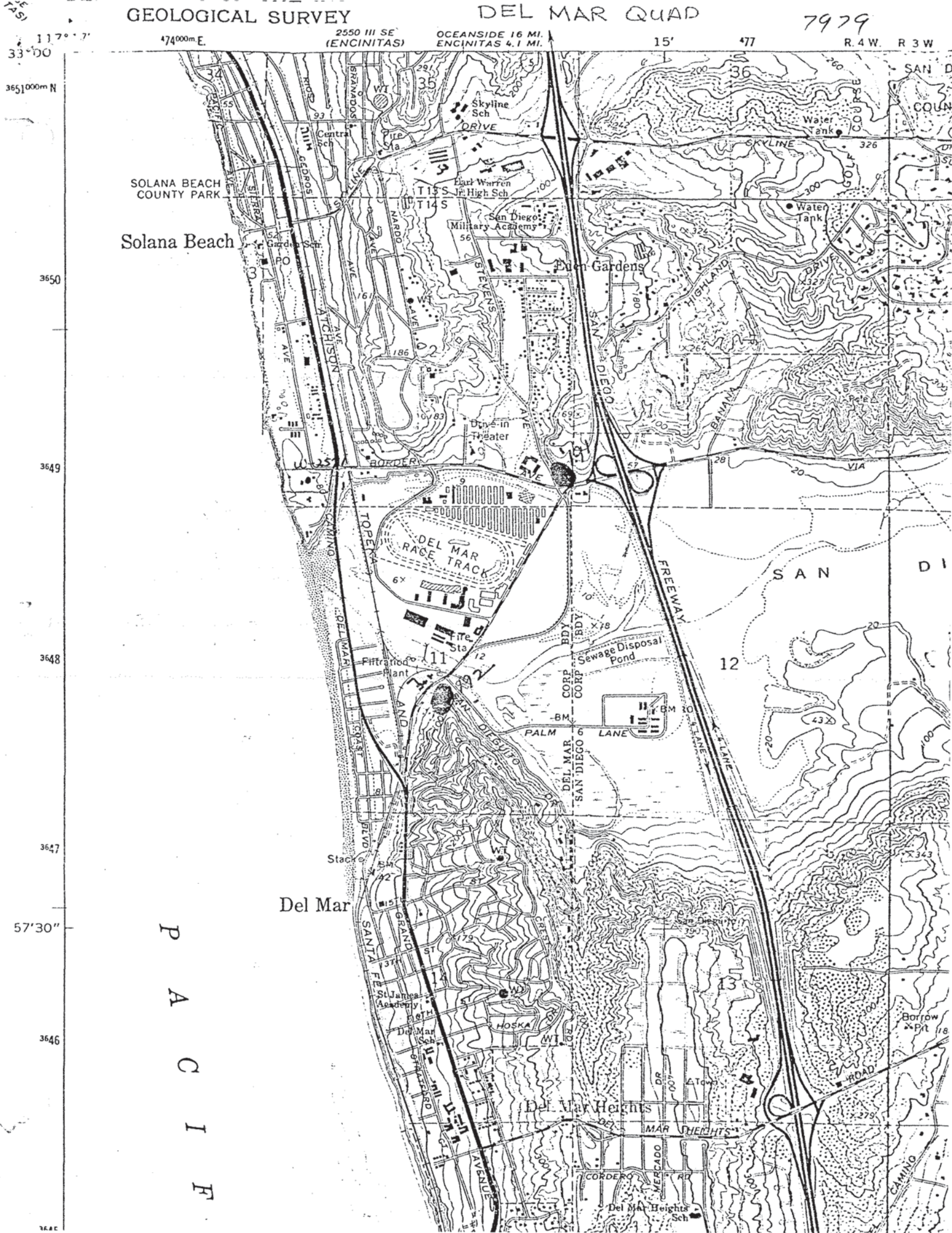
ATTACHED

7976

SURVEY



W- West House
G- Garage
E- East House


GEOLOGICAL SURVEY
DEL MAR QUAD
7979
2550 III SE (ENCINITAS)
OCEANSIDE 16 MI.
ENCINITAS 4.1 MI.
15'
R. 4 W.
R 3 W
117° 17' 30"
33° 00'
474000m E.
477
3651000m N
3650
3649
3648
3647
3646
57'30"
SOLANA BEACH COUNTY PARK
Solana Beach
Del Mar
Del Mar Heights
Torrey Pines
PACIFIC
Skyline Sch
Central Sch
Fire Sta
Earl Warren Jr High Sch
San Diego Military Academy
Garden Sch
PO
Water Tank
Golf Course
Drive-in Theater
DEL MAR RACE TRACK
Fire Sta
Filtration Plant
Sewage Disposal Pond
St James Academy
Del Mar Sch
Del Mar Heights Sch
Borrow Pit
Stack
SAN DIEGO FREEWAY
SAN DIEGO
HIGHLAND DRIVE
BANANA
VIA
TOPEKA
CAMINO DEL MAR
ATCHISON AVE
STEVENS AVE
NARDO AVE
GEOPOS LINE
SANTA FE
GRAND AVE
HOSKA DR
CORDERO RR
MERCADO DR
DEL MAR HEIGHTS ROAD
CAMINO
PALM LANE
BORDER
CORP BDY
DEL MAR SAN DIEGO BDY
SAN DIEGUITO
SKYLINE
T13S
T14S

APPENDIX C (CONFIDENTIAL)

NAHC and Tribal Correspondence

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 21, 2017

Katy Sanchez
Associate Government Program Analyst
Native American Heritage Commission

Subject: ***NAHC Sacred Lands Records Search Request for the Del Mar Resort Cultural Survey Project, City of Del Mar, California***

Dear Ms. Sanchez,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

Dudek is requesting a NAHC search for any sacred sites, traditional cultural properties, or other Native American cultural resources that may fall within a one-mile buffer of the proposed project location (Figure 1). Please provide contact information for all Native American tribal representatives that should be consulted regarding these project activities.

If you have any questions about this investigation, please contact me directly by email or phone.

Regards,

Scott Wolf
Archaeologist
DUDEK
Phone: (760) 479-3814
Cell: (858) 775-9028
Email: swolf@dudek.com

Attachments:
Figure1. Regional location map
Figure 2. Project location map

DUDEK

10414

FIGURE 1

Regional Map

Del Mar Resort Project

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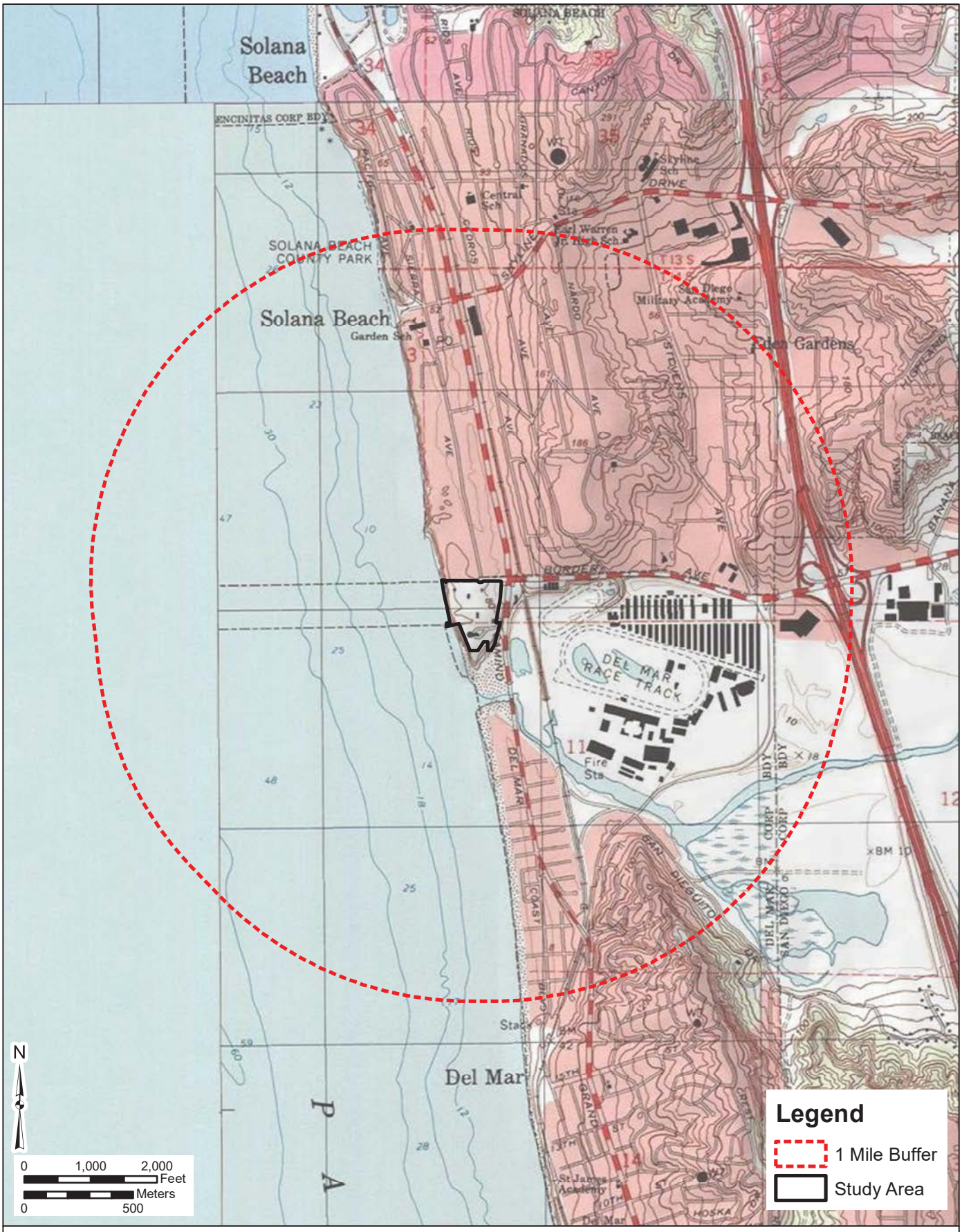

SOURCE: USGS 7.5-Minute Series Del Mar Quadrangle
Township 13S, 14S; Range 4W; Sections 1, 2, 3, 11, 12, 14, 34, 35

Records Search Map

Del Mar Resort Project

NATIVE AMERICAN HERITAGE COMMISSION
Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

June 22, 2017

Scott Wolf
Dudek

Sent by E-mail: swolf@dudek.com

RE: Proposed Del Mar Resort Cultural Survey Project, City of Del Mar; Del Mar USGS Quadrangle, San Diego County, California

Dear Mr. Wolf:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.

Attached is a list of tribes culturally affiliated to the project area. I suggest you contact all of the listed Tribes. If they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

Native American Heritage Commission
Native American Contact List
San Diego County
6/22/2017

Barona Group of the Capitan Grande
Edwin Romero, Chairperson
1095 Barona Road Kumeyaay
Lakeside, CA, 92040
Phone: (619) 443 - 6612
Fax: (619) 443-0681
clloyd@barona-nsn.gov

Campo Band of Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 Kumeyaay
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Tribal Office
Robert Pinto, Chairperson
4054 Willows Road Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126

Ewiiaapaayp Tribal Office
Michael Garcia, Vice Chairperson
4054 Willows Road Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130 Kumeyaay
Santa Ysabel, CA, 92070
Phone: (760) 765 - 0845
Fax: (760) 765-0320

Iipay Nation of Santa Ysabel
Clint Linton, Director of Cultural Resources
P.O. Box 507 Kumeyaay
Santa Ysabel, CA, 92070
Phone: (760) 803 - 5694
cjlinton73@aol.com

Inaja Band of Mission Indians
Rebecca Osuna, Chairperson
2005 S. Escondido Blvd. Kumeyaay
Escondido, CA, 92025
Phone: (760) 737 - 7628
Fax: (760) 747-8568

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 Kumeyaay
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas,
P.O. Box 775 Kumeyaay
Pine Valley, CA, 91962
Phone: (619)709-4207

La Posta Band of Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road Kumeyaay
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

La Posta Band of Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road Kumeyaay
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 Kumeyaay
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Del Mar Resort Project, San Diego County.

Native American Heritage Commission
Native American Contact List
San Diego County
6/22/2017

Manzanita Band of Kumeyaay Nation
Nick Elliott, Cultural Resources Coordinator
P. O. Box 1302 — Kumeyaay
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957
nickmepa@yahoo.com

Mesa Grande Band of Mission Indians
Virgil Oyos, Chairperson
P.O Box 270 — Kumeyaay
Santa Ysabel, CA, 92070
Phone: (760) 782 - 3818
Fax: (760) 782-9092
mesagrandeband@msn.com

Mesa Grande Band of Mission Indians
Mario Morales, Cultural Resources Representative
PMB 366 35008 Pala Temecula Rd. — Kumeyaay
Pala, CA, 92059
Phone: (760) 622 - 1336

Pauma Band of Luiseno Indians - Pauma & Yuima Reservation
Temet Aguilar, Chairperson
P.O. Box 369, Ext. 303 — Luiseno
Pauma Valley, CA, 92061
Phone: (760) 742 - 1289
Fax: (760) 742-3422

San Pasqual Band of Mission Indians
Allen E. Lawson, Chairperson
P.O. Box 365 — Kumeyaay
Valley Center, CA, 92082
Phone: (760)749-3200
Fax: (760)749-3876
allenl@sanpasqualtribe.org

San Pasqual Band of Mission Indians
John Flores, Environmental Coordinator
P. O. Box 365 — Kumeyaay
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
johnf@sanpasqualtribe.org

Sycuan Band of the Kumeyaay Nation
Lisa Haws, Cultural Resources Manager
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619) 312 - 1935

Sycuan Band of the Kumeyaay Nation
Cody J. Martinez, Chairperson
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619)445-2613
Fax: (619)445-1927
ssilva@sycuan-nsn.gov

Viejas Band of Kumeyaay Indians
Robert Welch, Chairperson
1 Viejas Grade Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337
jhagen@viejas-nsn.gov

Viejas Band of Kumeyaay Indians
Julie Hagen,
1 Viejas Grade Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337
jhagen@viejas-nsn.gov

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This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Del Mar Resort Project, San Diego County.

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Mr. Temet Aguilar, Chairperson
Pauma & Yuima Reservation
P.O. Box 369
Pauma Valley, CA 92061

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Aguilar,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

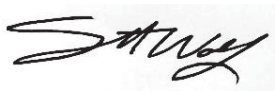
The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

The California Native American Heritage Commission conducted a Sacred Lands File search of the property and surrounding area. As a result, Native American cultural resources **were not identified**. Nonetheless, the NAHC recommended that we contact you regarding your knowledge of the presence of cultural resources that may be impacted by this project.

If you have any knowledge of cultural resources that may exist within or near the project area, please contact me directly at (760) 429-8404 or swolf@dudek.com at your earliest convenience.

Please note that this letter does not constitute Assembly Bill (AB) 52 notification or initiation of consultation. AB 52 is a process between the lead agency and California Native American Tribes concerning potential impacts to tribal cultural resources. Tribes that wish to be notified of projects for the purposes of AB 52 must contact the lead agency in writing (pursuant to Public Resources Code Section 21080.3.1(b)).

Thank you for your assistance.
Sincerely,



Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

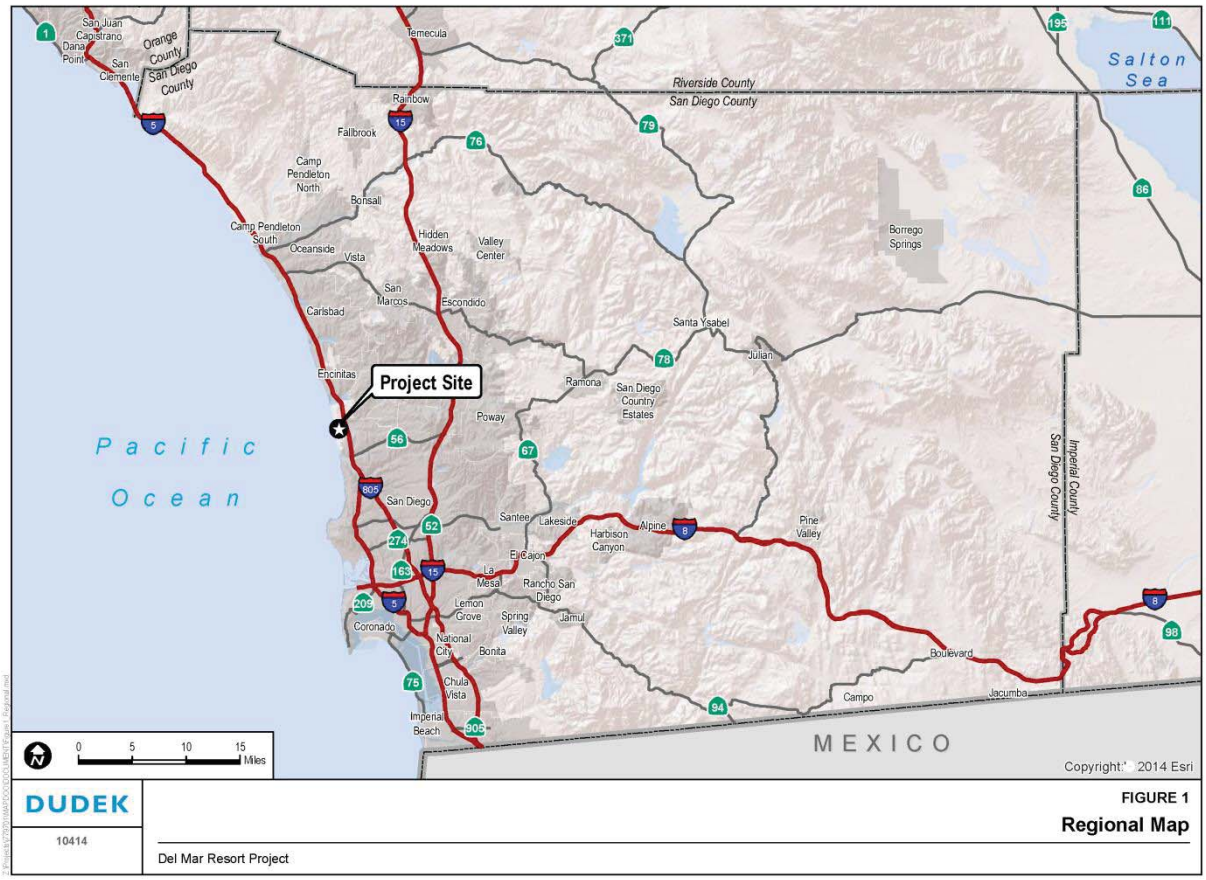


Figure 1. Regional project map

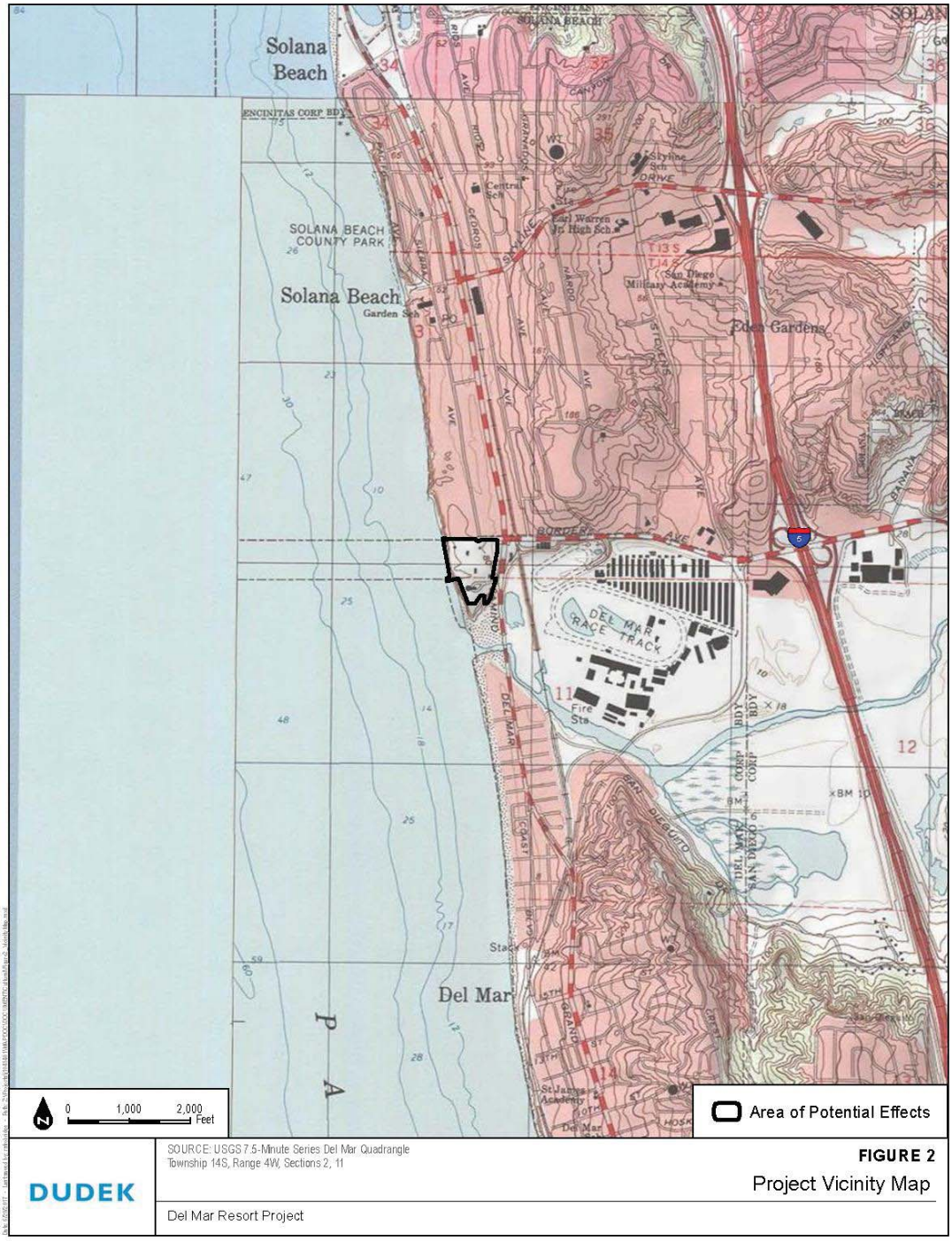


Figure 2. Project Vicinity map

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Mr. Nick Elliott, Cultural Resources Coordinator
Manzanita Band of Kumeyaay Nation
P.O. Box 1302
Boulevard, CA 91905

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Elliott,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

The California Native American Heritage Commission conducted a Sacred Lands File search of the property and surrounding area. As a result, Native American cultural resources **were not identified**. Nonetheless, the NAHC recommended that we contact you regarding your knowledge of the presence of cultural resources that may be impacted by this project.

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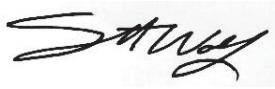

Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Mr. John Flores, Environmental Coordinator
San Pasqual Band of Indians
P.O. Box 365
Valley Center, CA 92082

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Flores,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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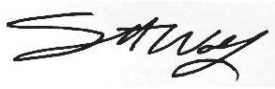

Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Mr. Michael Garcia, Vice Chairperson
Ewiiaapaayp Tribal Office
4054 Willows Road
Alpine, CA 91901

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Garcia,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

The California Native American Heritage Commission conducted a Sacred Lands File search of the property and surrounding area. As a result, Native American cultural resources **were not identified**. Nonetheless, the NAHC recommended that we contact you regarding your knowledge of the presence of cultural resources that may be impacted by this project.

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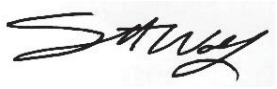

Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Mr. Ralph Goff, Chairperson
Campo Band of Mission Indians
36190 Church Road, Suite 1
Campo, CA 91906

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Goff,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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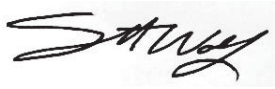

Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Ms. Julie Hagen, Cultural Resources
Viejas Band of Kumeyaay Indians
P.O. Box 908
Alpine, CA 91903

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Ms. Hagen,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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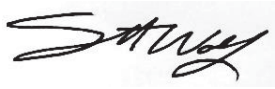

Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Ms. Lisa Haws, Cultural Resource Manager
Sycuan Band of the Kumeyaay Nation
1 Kwaaypaay Court
El Cajon, CA 92019

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Ms. Haws,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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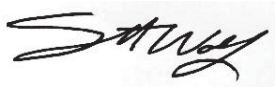

Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

DUDEK

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605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Mr. Allen E. Lawson, Chairperson
San Pasqual Band of Mission Indians
P.O. Box 365
Valley Center, CA 92082

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Lawson,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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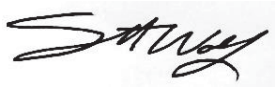
Please note that this letter does not constitute Assembly Bill (AB) 52 notification or initiation of consultation. AB 52 is a process between the lead agency and California Native American Tribes concerning potential impacts to tribal cultural resources. Tribes that wish to be notified of projects for the purposes of AB 52 must contact the lead agency in writing (pursuant to Public Resources Code Section 21080.3.1(b)).

Thank you for your assistance.
Sincerely,



Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Mr. Clint Linton, Director of Cultural Resources
Ipay Nation of Santa Ysabel
P.O. Box 507
Santa Ysabel, CA 92070

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Linton,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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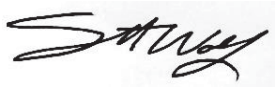

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June 22, 2017

Ms. Carmen Lucas,
Kwaaymii Laguna Band of Mission Indians
P.O. Box 775
Pine Valley, CA 91962

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Ms. Lucas,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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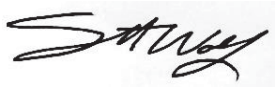

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Dudek Archaeologist

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June 22, 2017

Mr. Cody Martinez, Chairperson
Sycuan Band of the Kumeyaay Nation
1 Kwaaypaay Court
El Cajon, CA 92019

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Martinez,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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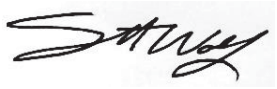

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June 22, 2017

Ms. Javaughn Miller,
La Posta Band of Mission Indians
8 Crestwood Rd.
Boulevard, CA 91905

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Ms. Miller,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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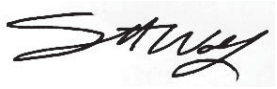

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Dudek Archaeologist

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June 22, 2017

Mr. Mario Morales, Cultural Resources Rep
Mesa Grande Band of Mission Indians
35008 Pala Temecula Rd. #366
Pala, CA 92059

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Morales,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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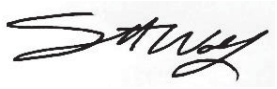

Scott Wolf
Dudek Archaeologist

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Figure 2. Project vicinity map

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605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Ms. Rebecca Osuna, Chairman
Inaja Band of Mission Indians
2005 S. Escondido Blvd.
Escondido, CA 92025

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Ms. Osuna,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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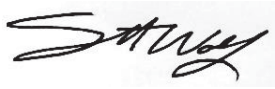

Scott Wolf
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605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Mr. Virgil Oyos, Chairperson
Mesa Grande Band of Mission Indians
P.O. Box 270
Santa Ysabel, CA 92070

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Oyos,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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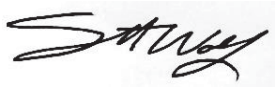

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June 22, 2017

Ms. Gwendolyn Parada, Chairperson
La Posta Band of Mission Indians
8 Crestwood Rd.
Boulevard, CA 91905

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Ms. Parada,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

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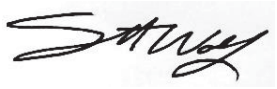

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June 22, 2017

Mr. Virgil Perez, Chairperson
Iipay Nation of Santa Ysabel
P.O. Box 130
Santa Ysabel, CA 92070

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Perez,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

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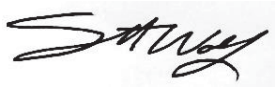

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Dudek Archaeologist

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Figure 2. Project vicinity map

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June 22, 2017

Ms. Erica Pinto, Chairperson
Jamul Indian Village
P.O. Box 612
Jamul, CA 91935

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Ms. Pinto,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

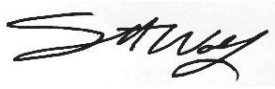
The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

The California Native American Heritage Commission conducted a Sacred Lands File search of the property and surrounding area. As a result, Native American cultural resources **were not identified**. Nonetheless, the NAHC recommended that we contact you regarding your knowledge of the presence of cultural resources that may be impacted by this project.

If you have any knowledge of cultural resources that may exist within or near the project area, please contact me directly at (760) 429-8404 or swolf@dudek.com at your earliest convenience.

Please note that this letter does not constitute Assembly Bill (AB) 52 notification or initiation of consultation. AB 52 is a process between the lead agency and California Native American Tribes concerning potential impacts to tribal cultural resources. Tribes that wish to be notified of projects for the purposes of AB 52 must contact the lead agency in writing (pursuant to Public Resources Code Section 21080.3.1(b)).

Thank you for your assistance.
Sincerely,



Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Mr. Robert Pinto, Sr., Chairperson
Ewiaapaayp Tribal Office
4054 Willow Rd.
Alpine, CA 91901

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Pinto, Sr.,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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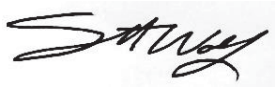

Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Mr. Edwin Romero, Chairperson
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Romero,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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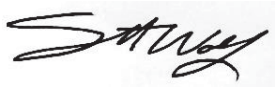

Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Ms. Angela Elliott Santos, Chairperson
Manzanita Band of Kumeyaay Nation
P.O. Box 1302
Boulevard, CA 91905

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Ms. Santos,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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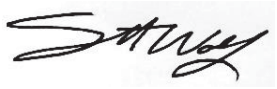
Thank you for your assistance.
Sincerely,



Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 22, 2017

Mr. Robert Welch, Sr., Chairperson
Viejas Band of Kumeyaay Indians
1 Viejas Grade Rd.
Alpine, CA 91901

Subject: ***Information Request for the Del Mar Resort Cultural Resources Survey Project, City of Del Mar, California***

Dear Mr. Welch, Sr.,

Dudek is contracted to conduct a Phase I cultural resource survey of the Del Mar Resort Cultural Survey project, City of Del Mar, California. The Project site is approximately 16.56 acres and is located south of Via del la Valle and west of Camino Del Mar, in the City of Del Mar; see Figures 1 and 2, Project Regional and Vicinity Maps. Assessor's Parcel Numbers are: 298-241-06, 07, 29, 34, 35, 36 and 299-030-14 and 15. The Project site comprises eight (8) parcels. The seven northerly parcels are vacant. The southernmost parcel is currently developed with a one-story, 5,800 square foot residence.

The Project includes a multiple-building hotel resort complex including a Resort Hotel ranging from approximately 260 to 290 keys with two restaurants, a ballroom, banquet facilities, public access amenities, a spa and fitness center and swimming pools. Additionally, the Project includes approximately 170,000 square feet of Resort Villas use containing a variety of unit types. An underground parking structure is also proposed. The Project site would be accessible from the intersection of Sierra Avenue and Via de la Valle on the northern side of the property. The proposed Project site is currently zoned R1-14 (Modified Low Density) and R1-40 (Very Low Density); Existing Zoning. The City's 1985 Community Plan designates the Project site as Public Parkland. The Project proposed to re-designate and rezone the site as "Specific Plan Area."

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If you have any knowledge of cultural resources that may exist within or near the project area, please contact me directly at (760) 429-8404 or swolf@dudek.com at your earliest convenience.

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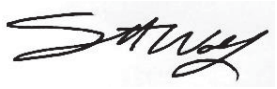


Scott Wolf
Dudek Archaeologist

Attachments: *Figure 1. Regional project map*
Figure 2. Project vicinity map

Tribal Responses for the Del Mar Resort Cultural Survey Project

VIEJAS
TRIBAL GOVERNMENT

P.O Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 619.445.3810
Fax: 619.445.5337
viejas.com

June 27, 2017

Scott Wolf
Archaeologist
Dudek
605 Third Street
Encinitas, CA 92024

RE: Del Mar Resort Project

Dear Mr. Wolf,

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has cultural significance or ties to Viejas.

Viejas Band request that a Kumeyaay Cultural Monitor be on site for ground disturbing activities to inform us of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains.

Please call me at 619-659-2312 or Ernest Pingleton at 619-659-2314 or email, rteran@viejas-nsn.gov or epingleton@viejas-nsn.gov , for scheduling. Thank you.

Sincerely,

Ray Teran, Resource Management
VIEJAS BAND OF KUMEYAAY INDIANS

June 30, 2017

Attn: Scott Wolf
Archaeologist, DUDEK
605 Third Street
Encinitas, CA 92024

RE: Cultural Resources Investigation for Del Mar Resort Cultural Resources Survey Project, City of Del Mar, california

We appreciate your observance of Tribal Cultural Resources and their preservation in your project. The information provided to us on said project has been assessed, where it was concluded that although it is outside the existing Mesa Grande Indian Reservation, the project area does fall within the bounds of our Tribal Traditional Use Areas. This project location is in proximity to known sites, is a shared use area that was used in ongoing trade between the villages, and is considered to be potentially culturally sensitive.

It is fully understood that DUDEK is not the lead agency and oversees no responsibility for consultation. Although it should be understood that due to the sensitivity of traditional tribal knowledge, specifics will be discussed in a confidential setting with the lead agency. It is our request that record of this letter be included into the Cultural Resource Study being compiled by DUDEK in sections for tribal correspondence and response.

Furthermore, it is my request to be notified prior to any scheduled field studies such as Phase 1 or Pedestrian Surveys and/or testing such as Phase 2, trenching, shovel test pits and screening.

I look forward to hearing back from you in the near future, confirming your receipt of this letter and the implementation our my requests.

Sincerely,

Mario Morales
Tribal Member, Mesa Grande Band of Mission Indians
PMB 366
35008 Pala Temecula Rd
Pala, CA 92059

760-622-1336
mgndn71@yahoo.com

SPEDA
San Pasqual Economic Development Agency
Honoring the Past • Embracing the Present • Leading the Future

VIA E-Mail and USPS

RE: Request for Information for the Del Mar Resource Survey Project, City of Del Mar, California

Dear Scott Wolf
Archaeologist
DUDEK
Phone: (760) 429-8404
Email: swolf@dudek.com

The San Pasqual Economic Development Agency and affiliate San Pasqual Band of Diegueño Indians ("the Tribe") appreciates your request for information regarding the above referenced project. After reviewing the provided maps, we have determined that the project area is within our ancestral territory, and within the area of responsibility of the Reservation. Unfortunately, we have no information regarding Scared Sites.

Please note that we are interested in participating on this project. Prior to conducting any Cultural Resource surveys, excavations and/or monitoring, please contact the San Pasqual Economic Development Agency for schedule specifics. If you have any additional questions or comments. Please contact me at (760) 751-7001 or CulturalMonitoring@sanpasqualtribe.org

Sincerely,

Jim McPherson
Manager
Cultural Monitoring Program

P.O. Box 10 • 28000 Via Viso Road
Valley Center • California • 92082

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

MEMORANDUM

To:	Scott Wolf, Dudek Archaeologist
From:	Chris Devers, Cultural Liaison, Pauma Band of Luiseno Indians
Subject:	Tribal Response for the Del Mar Resort Project
Date:	Received 07-13-2017
cc:	pdixion@palomar.edu; Jeremy Zagarella
Attachment(s):	None

Email Received:

"Mr. Wolf,

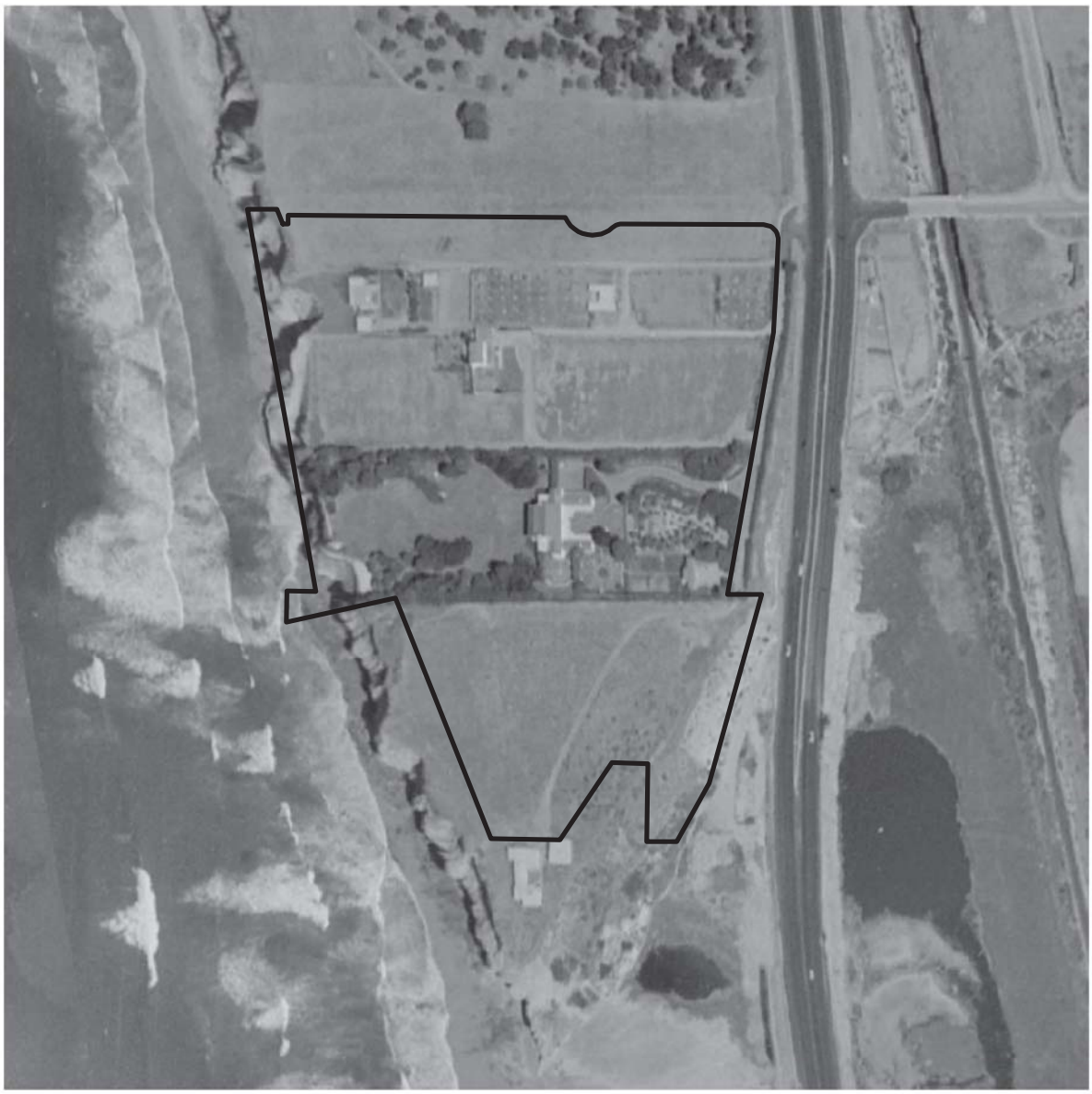
The Cultural Office of the Pauma Band of Luiseno Indians has received your June 22 request for the Del Mar Resort Project. We are unaware of any specific cultural sites or resources on the project property. Please provide us with copies of the cultural studies that have or are in the process of being completed. Please contact us if there are any questions.

Thank you,

Mr. Chris Devers
Cultural Liaison
Pauma Band of Luiseno Indians"

APPENDIX D

Historic Aerial Image Search



0 150 300 Feet

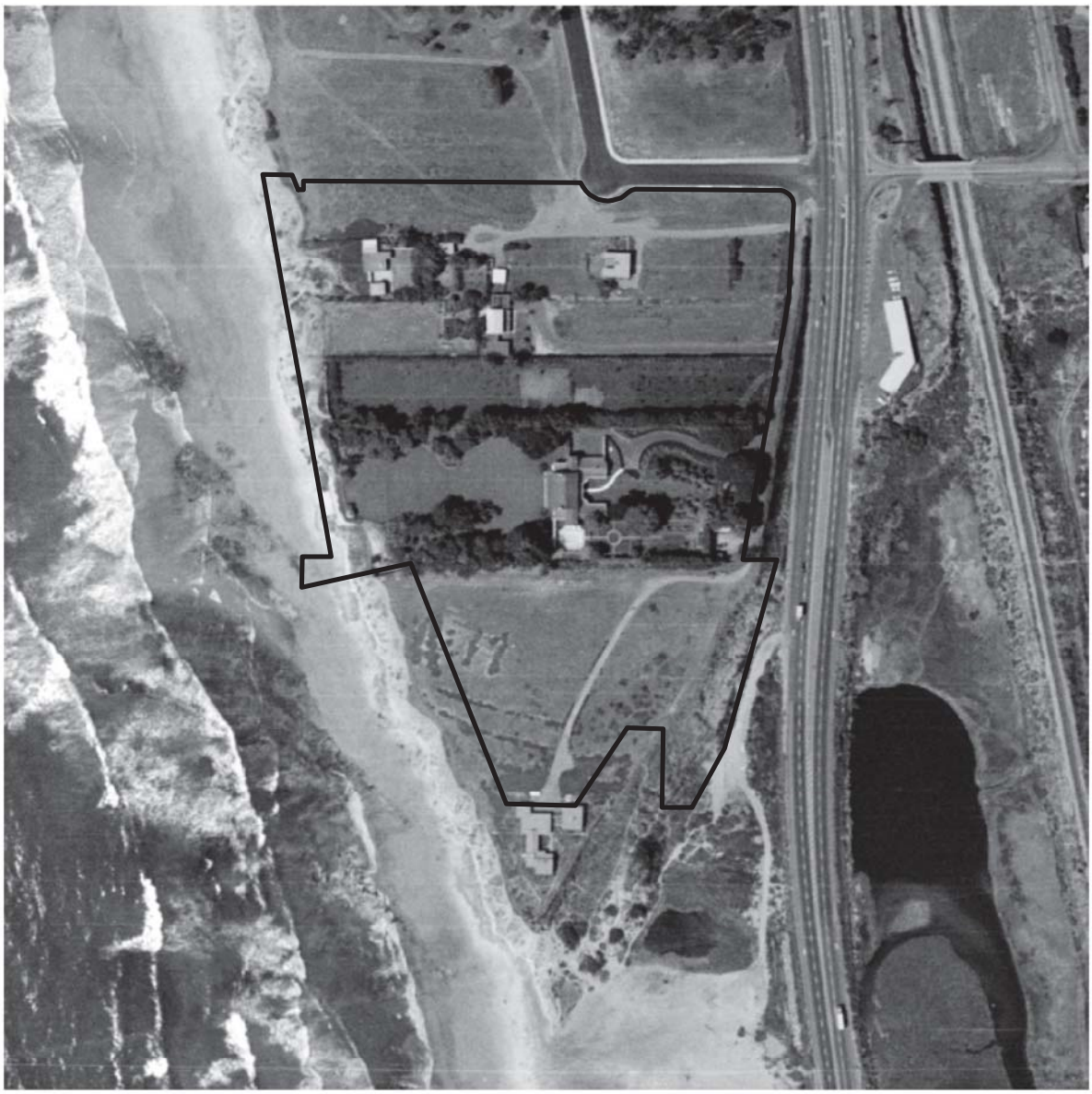
APE Boundary

DUDEK

FIGURE D-01

1953 Del Mar Resort Aerial Image

Date: 7/26/2017 - Last saved by: rstrobridge - Path: Z:\Projects\10414011\MAPDOC\DOCUMENT\Cultural\Appendix\D01_HistoricAerial_1953.mxd



0 150 300 Feet

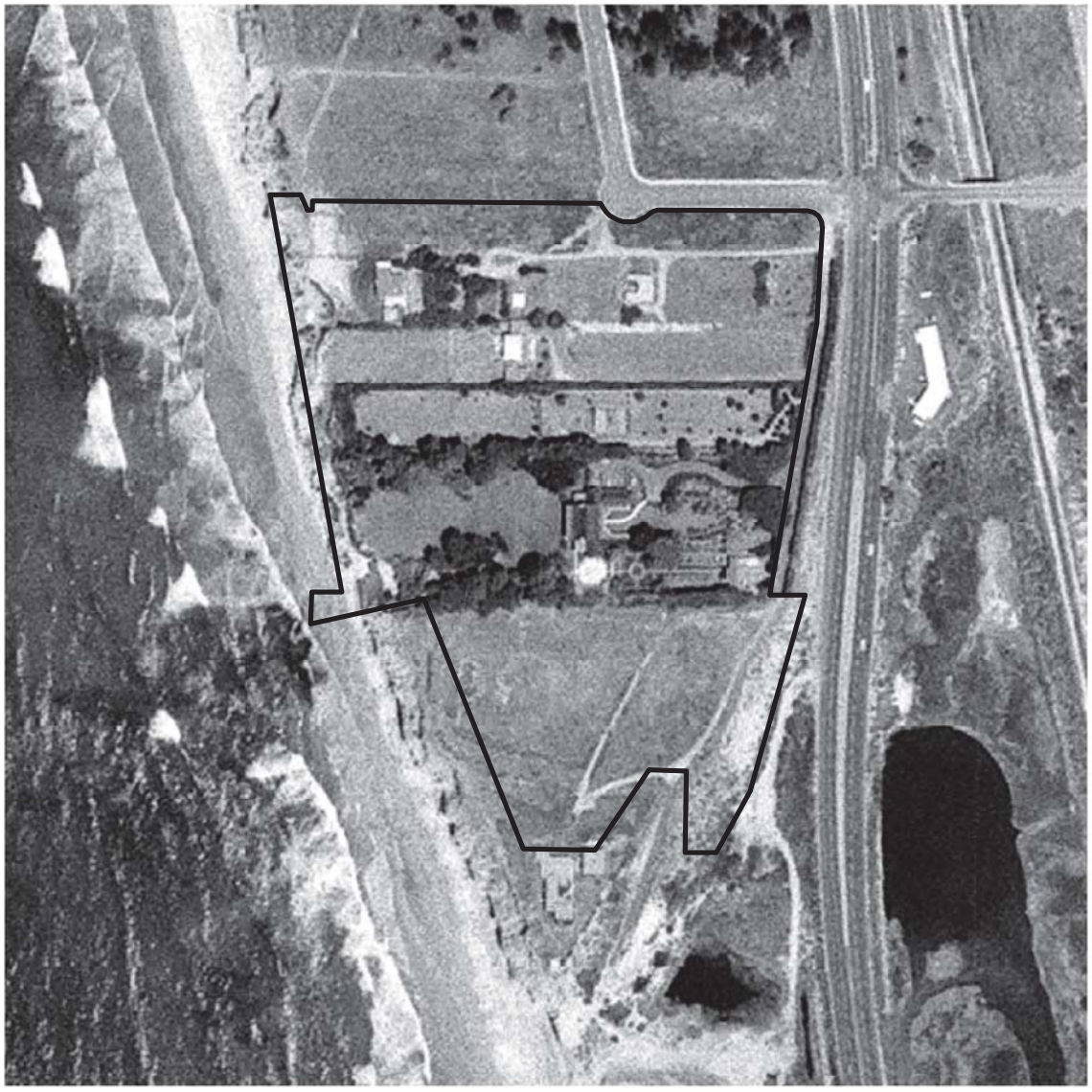
APE Boundary

DUDEK

FIGURE D-02

1964 Del Mar Resort Aerial Image

Date: 7/26/2017 - Last saved by: rstrobridge - Path: Z:\Projects\1041401\MAPDOC\DOCUMENT\Cultural\Appendix\D02_HistoricAerial_1964.mxd



0 150 300 Feet

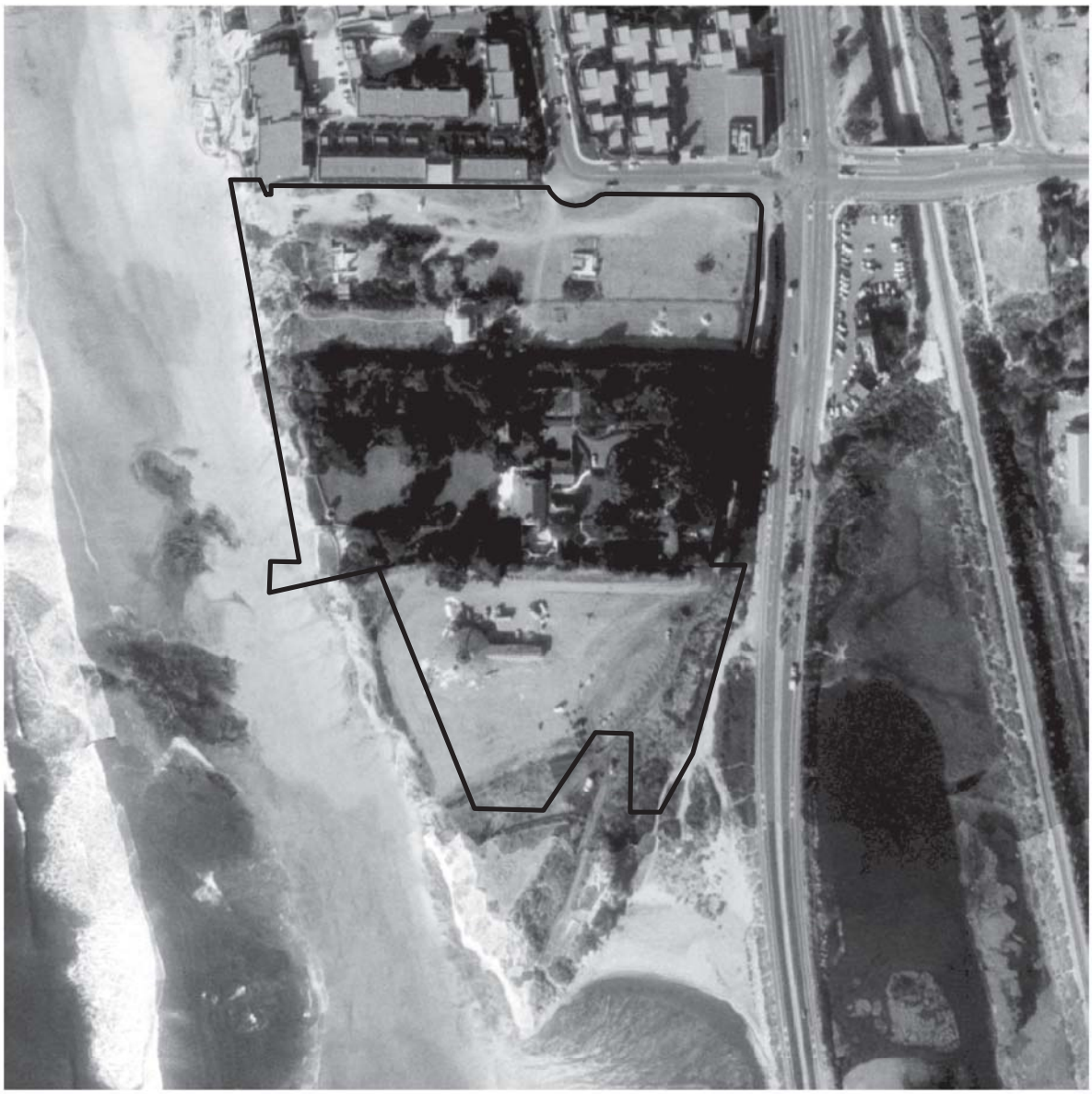
APE Boundary

DUDEK

FIGURE D-03

1967 Del Mar Resort Aerial Image

Date: 7/26/2017 - Last saved by: rstrobridge - Path: Z:\Projects\10414011\MAPDOC\DOCUMENT\Cultural\Appendix\D03_HistoricAerial_1967.mxd



0 150 300 Feet

APE Boundary

FIGURE D-04

1980 Del Mar Resort Aerial Image

DUDEK

Date: 7/26/2017 - Last saved by: rstrobridge - Path: Z:\Projects\1041401\MAPDOC\DOCUMENT\Cultural\Appendix\D04_HistoricAerial_1980.mxd

0 150 300 Feet

APE Boundary

DUDEK

FIGURE D-05

1990 Del Mar Resort Aerial Image

Date: 7/26/2017 - Last saved by: rstrobridge - Path: Z:\Projects\10414011\MAPDOC\DOCUMENT\Cultural\Appendix D05_HistoricAerial_1990.mxd

0 150 300 Feet

APE Boundary

DUDEK

FIGURE D-06

2003 Del Mar Resort Aerial Image

Date: 7/26/2017 - Last saved by: rstrobridge - Path: Z:\Projects\1041401\MAPDOC\DOCUMENT\Cultural\Appendix\D06_HistoricAerial_2003.mxd

0 150 300 Feet

APE Boundary

DUDEK

FIGURE D-07

2012 Del Mar Resort Aerial Image

Date: 7/26/2017 - Last saved by: rstrobridge - Path: Z:\Projects\10414\01\MAPDOC\DOCUMENT\Cultural\Appendix\D07_HistoricAerial_2012.mxd

APPENDIX E (CONFIDENTIAL)

DPR Site Forms and Updates

Site Background:

CA-SDI-10940, also known as the "Del Mar Man Site" is a large habitation/midden site, originally recorded by Malcom Rogers (circa 1929), which became the center of controversy in the late-1970s-early-1980s when bone dating procedures provided evidence that a skull from this site was over 48,000 years old. The procedures used at the time were since proven to be inaccurate and in 1984 the previous date were retracted. Modern C14 accelerator procedures provide currently-accepted evidence that when dated the skull was approximately 5,000 years old. The site, apparent from the record search data, has been the focus of three previous cultural investigations in 1929, 1963, and 1974 and then re-visited in 1988 after the southern portion of the property had been residentially developed, then subsequently demolished, and abandoned (Aerial Images 1953 to 2013).

Excavation notes from Rodgers archaeological investigations at SDI-10940 are somewhat unclear as to the actual volume and recovery of cultural materials and artifacts: however, from maps of the excavations, it appears Rodgers excavated a total of 30 excavation units in the southern and lower terrace portion of the site (Rodgers called "W-34") and excavated two test pit excavation units on the upper terrace the portion of the site (identified by Rodgers as "W-34A").

In 1995, Dayle Cheever with RECON Environmental Inc. conducted a cultural resource significance testing project at the site and encountered cultural materials and artifacts scattered along the upper terrace, W-34A; the 1995 testing excavations apparently did not extend to the lower terrace, W-34. A total of six shovel test pits (STPs) and two sample (1m x 1m) units were excavated along the northern terrace. Three out of the six STPs were positive and both of the sample units were positive, as they were intentionally placed near positive STPs. In general, cultural materials were recovered from the ground surface to approximately 80 centimeters below the surface (cmbs). A total of 9,228 grams of marine invertebrate shell fragments, 5 grams of bone, 56 flakestone (flakes and debitage) artifacts, 6 flakestone tools (including 5 hammerstones and 1 chopper), and 1 milling handstone was recovered from the subsurface excavations (Cheever 1997).

The RECON testing of SDI-10940 established that portions of CA-SDI-10940 were still intact and in relatively undisturbed condition. In fact, the Cheever report introduces the comments that the site had at one time previously been capped with sterile dirt as a method of preservation (Cheever 1997, page 19). Cheever concludes that CA-SDI-10940 is "a significant site under criteria B, D, and E of CEQA. This site may also be interpreted to qualify under criterion C, because of the destruction of many coastal archaeological sites through development and/or intensive agriculture" (Cheever 1997). Cheever recommends that a data recovery program would be needed to be conducted at SDI-10940 to mitigate potential destruction of this resource.

Following the data recovery, Native American and archaeological monitors should be present during construction grading or other ground-disturbing activities for potential projects. Finally, it was recommended that an Archaeological Resource Management Report (ARMR) technical report would need to be prepared and submitted to the City of Del Mar, for review by City staff and approved before map or permit approval (Cheever 1997, page 22).

2017 Survey & Extended Phase I Testing:

In June 2017, Dudek archaeologist Scott Wolf, accompanied by Red Tail Research and Monitoring Inc.'s Native American monitor, Kevin Osuna, for a pedestrian survey for the Del Mar Resort Cultural Survey Project, and relocated artifacts and marine invertebrate shell fragments associated with SDI-10940. CA-SDI-10940 was previously recorded just to the south of the current project's parcel APN 299-030-15, with some of the site extending north into the southern edge of APN 299-030-15 (See Sketch map).

Scott Wolf returned on November 03, 2017 to the property for an extended Phase I, survey of just the upper terrace where artifacts were initially identified on the survey in June. Scott Wolf lead Dudek archaeological technicians Jessica Colston, P.K. Garcia-Sharpe, and archaeological intern David Faith in excavating a total of three shovel test units (STP's) and two 3" auger test pits and a surface collection at SDI-10940. Native American monitor Justin Linton, representing Red Tail Inc., was present for all subsurface testing excavations conducted during the Phase I excavations.

Three STPs measuring 25cm x 50cm were placed judgmentally, on a roughly north-northeast-to-south-southwest diagonal line, approximately 15 m apart through the part of the terrace that had the highest density of surface artifacts and shell fragments. STPs 1 and 2 had a similar stratigraphic profile and both had evidence of an intact deflated shell midden deposit approximately 30 to 60 centimeters below the surface (cmbs). The stratigraphy encountered in STPs 1 and 2 consisted of a very dark brown (Munsell: 10YR3/2) loosely compact slightly silty-sandy loam with consistent, moderate volume of marine invertebrate shell fragments extending down from the ground surface to approximately 30 cmbs. From approximately 30 to 60 cmbs a tightly compacted deposit of marine invertebrate shells and fragments embedded into a matrix of compact brown (Munsell: 10YR4/3) sandy loam was encountered. STPs 1 and 2 were excavated to an approximate depth around 70 cmbs and then a 3" bucket auger was used to excavate further due to the increasing compactness of sediments encountered. Sediments encountered from approximately 70 cmbs down to a depth of approximately 120 cmbs in the auger consisted of a very compact brown (Munsell: 7.5YR5/3) with small friable fragments of marine invertebrate shell remains. Sediments encountered at approximately 120 to 140 cmbs consist of a slightly less compact reddish brown (Munsell: 5YR5/4) sandy loam, most likely sandstone formation. STP/ augers 1 and 2 were both terminated at an approximate depth around 140 cmbs.

STP 3 was positive, in that it yielded small fragments of marine shell invertebrate remains, but the intact shell deposit identified in STPs 1 and 2, was not encountered. Instead only a lighter volume of marine invertebrate fragments was encountered during entire excavation of STP 3, a volume similar to the amounts of shell fragments that were encountered below 60 cmbs in STPs 1 and 2. The sediment profile identified in STP 3 consisted of loosely compact brown (Munsell: 10YR4/3) sandy loam down to approximately 30 cmbs, which transitioned into a very compact brown (Munsell: 7.5YR5/3) with small friable fragments of marine invertebrate shell remains. Sediments encountered at approximately 100 to 110 cmbs consist of a compact reddish brown (Munsell: 5YR5/4) sandy loam, most likely sandstone formation. STP/ auger 3 and was terminated at an approximate depth around 110 cmbs.

With a limited amount of time and relatively compact sandy sediments encountered, an additional two 3" bucket auger test pits were excavated in an attempt to further delineate the extent of the subsurface shell deposit encountered in STPs 1 and 2. Auger 1 was placed judgmentally to the east of the line of STPs excavated, slightly north of STP 2, and immediately in between the property border fence and the artificially created dirt berms identified adjacent to the property fence.

The sediment profile encountered in Auger 1 consisted of loosely compact brown (Munsell: 10YR4/3) sandy loam from the ground surface down to approximately 50 cmbs, which transitioned into a very compact brown (Munsell: 7.5YR5/3) and then into reddish brown (Munsell: 5YR5/4) with small friable fragments of marine invertebrate shell remains encountered to an approximate depth of 230 cmbs. It should be noted that Auger 1 was located less than 2 meters from the top of the eastern edge of the landform where a steep slope drops off (to the east) to a maintained slope and City park area below (See Figure 5). The location of Auger 1 is important because the results of the test pit most likely reflect the physical location of the test pit rather than an example of a buried, intact cultural deposit.

Auger 2 was excavated approximately 15 meters west of the line of three STPs, immediately adjacent to the current paved driveway, within the manicured landscape of the standing residence. The sediment profile encountered in Auger 2 consisted of loosely compact brown (Munsell: 10YR4/3) sandy loam from the ground surface down to approximately 20 cmbs. Sediments encountered at 20 cmbs transitioned below into a very compact brown (Munsell: 7.5YR5/3) with a moderate amount of small friable marine shell invertebrate fragments extending down to approximately 90 cmbs. Sediments encountered below 90 cmbs became a reddish brown (Munsell: 5YR5/4) compact sand with a low volume of small friable fragments of marine invertebrate shell remains encountered to an approximate depth of 110 cmbs. No shell fragments were encountered in the sandy sediments from 110 to 140 cmbs. Auger 2 was terminated at an approximate depth of 140 cmbs.

A grand total of 2,880 items were recovered during the extended Phase I testing of site SDI-10940. These cultural materials recovered included a total of 2,831 fragments of marine invertebrate shell remains with a total weight of 1,582 grams, 1 rodent bone, 1 volcanic multi-directional core, 1 quartzite hammerstone fragment, 27 pieces of volcanic flakestone debitage, 13 fragments of fire-affected-rock (FAR), and 6 items of modern/intrusive items which include 1 fragment of glass, two quarters and 3 pennies. As well as excavating STPs and auger test pits, a general surface collection was conducted across the area where observable cultural materials were identified and a total of 2 tool artifacts were GPS point recorded and collected. These tool artifacts include 1 reddish-orange colored quartzite percussion tool/hammerstone fragment and 1 multi-directional gray-green volcanic core. Both artifacts have been fire affected and demonstrate the clear discoloration evidence of having been exposed to fire. An additional eight (8) flakes were collected as a general sample of the materials scattered on the ground surface which consist of 3 primary course-grained gray-green colored volcanic flakes, 2 secondary course-grained gray-green colored volcanic flakes, and a total of three interior course-grained gray-green colored volcanic flakes.

The excavation of STP 1 recovered a total of 1,429 marine invertebrate shell fragments, 6 various volcanic flakes, and 7 fragments of FAR. There was a recovery of 142 shell fragments and 2 volcanic flakes from 0 (ground surface) to 20 centimeters below surface (cmbs); a total of 605 shell fragments, 2 volcanic flakes and 7 fragments of FAR were recovered from 20 to 40 cmbs; a total of 670 shell fragments and 2 flakes were recovered from 40 to 60 cmbs, and a sample of 12 small shell fragments were sampled from the auger excavation from 60 to 110 cmbs within STP 1.

The excavation of STP 2 recovered a total of 1,181 marine invertebrate shell fragments, 1 rodent bone, 6 volcanic flakes, 6 fragments of FAR, 1 fragment of clear glass, 2 U.S. quarters (bicentennial "Drummer Boy" quarters), and 3 U.S. pennies (dated 1963, 1975, and 1976). There was a recovery of 96 shell fragments, three volcanic flakes, 1 FAR fragment, 1 clear glass fragment, and 5 intrusive coins from 0 to 20 cmbs; a total of 549 shell fragments, and 3 fragments of FAR were recovered from 20 to 40 cmbs; a total of 487 shell fragments, 3 flakes, and 2 fragments of FAR were recovered from 40 to 60 cmbs, and a sample of 50 small shell fragments were sampled from the auger excavation from 60 to 120 cmbs within STP 2.

The excavation of STP 3 recovered a total of 57 marine invertebrate shell fragments, and 6 volcanic flakes. There was a recovery of 17 shell fragments, and 2 volcanic flakes from 0 to 20 cmbs; a total of 12 shell fragments, and 2 volcanic flakes were recovered from 20 to 40 cmbs; a total of 11 shell fragments were recovered from 40 to 60 cmbs, a total of 10 shell fragments, and 2 volcanic flakes were recovered from 60 to 80 cmbs; and a sample of 7 small shell fragments were sampled from the auger excavation from 80 to 120 cmbs within STP 3.

The excavation of Auger 1 yielded a combined total of 153 shell fragments, two volcanic flakes which were recovered from the ground surface to a terminal depth of approximately 230, while the excavation of Auger 2 yielded only a total of 11 shell fragments recovered from the ground surface to a depth of 120 cmbs.

Before the extended testing was completed, a surface collection was conducted which identified two tools and a general sample of debitage was collected, yielding a total of 3 primary volcanic flakes, 2 secondary volcanic flakes, and 3 volcanic interior flakes. Artifact A1 was identified on the ground surface, point provenience collected and consists of a Fire-affected, multi-directional volcanic core. Artifact A2, located immediately adjacent to the eastern property edge consists of a quartzite Percussion/hammerstone fragment.

Artifacts and Species Identified

By a large margin, marine invertebrate shell fragments consisted of the bulk of the materials recovered (n=2831, or 78.57% of the total). Flakestone artifacts constitute the second highest volume of material recovered (n=28, or approximately 14% of the total). The complete breakdown of the materials recovered is demonstrated in Table 3.

Table 3. Materials Recovered During Testing

Materials recovered from SDI-10490	# of Total	% of Total
Faunal	**2832**	**79.46%**
Invertebrate Remains	2831	78.57%
Vertebrate Remains	1	0.89%
Flaked Stone	**28**	**14.29%**
Core	1	0.89%
Debitage	27	13.39%
Percussing Tool	**1**	**0.89%**
Hammerstone	1	0.89%
Misc.	**13**	**3.57%**
Fire-Affected Rock	13	3.57%
Modern Item	**6**	**1.79%**
Modern/Intrusive	6	1.79%
Grand Total	**2880**	**100.00%**

The flakestone recovered from SDI-10940 consist of mainly volcanic flakes and demonstrate a rather even distribution of flake types with relatively equal numbers of primary, secondary and interior flakes. While a majority of flakes identified are relatively large in size, bulky and appear to represent reduction of larger items, several smaller thinning flakes were identified, thus suggesting a possible wide range of lithic reduction activities, from breaking down larger cores to the refinement of already formed tools, or re-sharpening or re-shaping. The quartzite hammerstone fragment demonstrates clear evidence of peaking/wear damage on the intact end of the artifact and, as mentioned before shows signs of being fire-affected. While the relatively lower volume of lithic assemblage recovered does not offer a dramatic diagnostic data, it does go a considerable distance in confirming that the deposit encountered during this extended Phase I testing is: a). cultural in nature, not a natural deposit, and b). confirms the existence of, and the constituents of the deposit that was encountered during Cheever's 1995-6 excavations in this vicinity on the upper terrace.

Identified invertebrate species recovered from the subsurface deposit at SDI-10940 include several species of barnacle, bean clams (*Donax gouldii*), Chama, Chione, Chiton, various crustacean species fragments, Jewelry Box (*Pseudochama*), various Limpet (*Lottia*) species, Mussel (*Mytilus*), several Oyster species (*Ostrea*), Razor Clam (*Siliqua patula*), Scallops (*Argopecten*), Tegula, Washington Clam (*Saxidomus*), Wavy Turbin (*Megastrea undosa*), Whelk, and several species of various marine snails. The highest volume of a specific identified species was Chione making up roughly 10% of the invertebrate species identified, with Argopecten, or scallops making up roughly 09% of the collection, and Mytilus, or mussels making up roughly 8% of the entire invertebrate collection.

References:

Cheever, Dayle M. 1995. *Cultural Resource Testing at CA-SDI-10,940 (SDM-W-34A) Whittier Property TPM 94-1*. Report prepared by RECON Environmental and prepared for the City of Del Mar Planning Department, 1050 Camino Del Mar, Del Mar, CA 92014.

Kirkish, A.N., and Brian F. Smith. 1997. *Results of a Data Recovery Program at Site SDI-7979, The Whittier-Del Mar Project at Border Avenue, Del Mar, California*. Report on file at South Coastal Information Center, San Diego State University.

Wolf, J.S., and Micah J. Hale. 2017. *Cultural Resources Survey Report for the Del Mar Resort Project, City of Del Mar, San Diego, California*. Draft report pending.

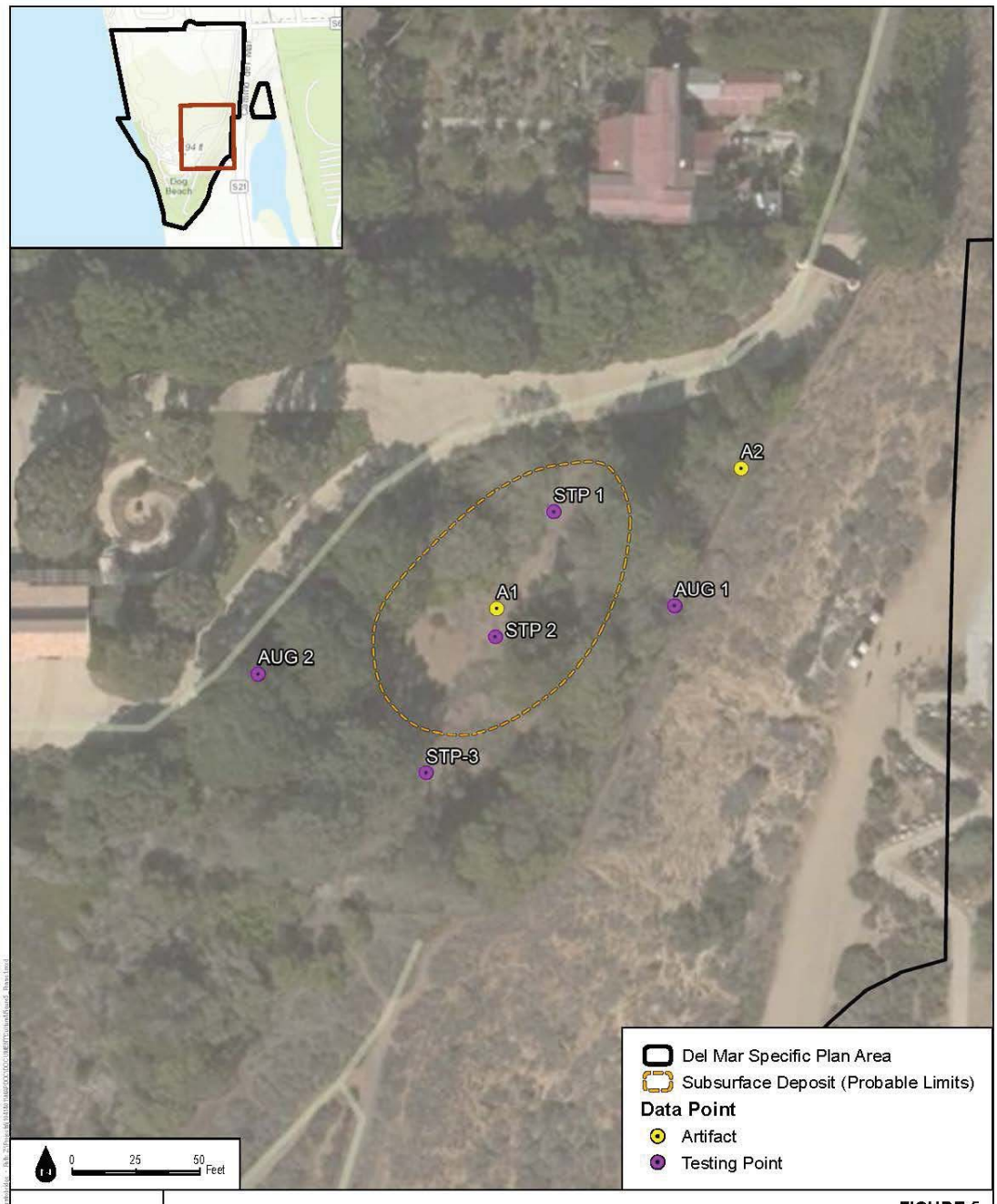
Right: Close up of wall profile. Deposit is along the 20cm mark on tape in image

Left: STP 1 west wall profile from 0 to 70 cmbs, before an auger was excavated in the center of 70 cmbs floor. Sediment transition just below shell deposit (30-60 cmbs) can be seen in sidewall.

Left: CA-SDI-10940, site overview, to the northeast, showing scatter of lithic artifacts (orange flags) and marine shell fragments that are part of the northern portion of SDI-10940. Image showing the area just south of the modern driveway, and apparently the densest surface evidence of what remains of this site on upper terrace (IMG_4030).

Right: Surface scatter is located south of the driveway, view to the south (IMG_4026).

N Shore Dr
Beach Club Dr
S Shore Dr
S Sierra Ave
Border Ave
S21
S Cedros Ave
Cofair Ct
Camino del Mar
2982412900
2982413400
P-37-007878
2982413600
2982413500
2982410600
2982410700
2990301400
P-37-010940
2990301500
San Dieguito River
0
150
300
Feet
Del Mar Specific Plan Area
Parcel Boundary
APE Boundary
Current Distribution of Cultural Materials On Ground Surface
Surveyed Resource Polygon
Estimated Boundary Outside APE
SOURCE: Bing Maps (Accessed 2017); SANGIS
DUDEK
FIGURE 4
Current Survey Resource Map
Cultural Resources Survey Report
Del Mar Resort Project



DUDEK

SOURCE: Bing Maps (Accessed 2017)

FIGURE 5
SDI-10940 Extended Phase 1 Testing Map

Cultural Resources Survey Report
Del Mar Resort Project

Appendix F

Geotechnical Investigation

GEOTECHNICAL INVESTIGATION

MARISOL
DEL MAR, CALIFORNIA

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR

ZEPHYR PARTNERS
ENCINITAS, CALIFORNIA

SEPTEMBER 6, 2019
PROJECT NO. G1710-32-04

Project No. G1710-32-04
September 6, 2019

Zephyr Partners
700 Second Street
Encinitas, California 92024

Attention: Mr. Jim McMenamin

Subject: GEOTECHNICAL INVESTIGATION
MARISOL
DEL MAR, CALIFORNIA

Dear Mr. McMenamin:

In accordance with your request, and authorization of our proposal and subsequent scope addendums, we have performed a geotechnical investigation on the properties that will support a proposed resort in Del Mar, California. The accompanying report describes the soil and geologic conditions encountered on the site and provides recommendations relative to the geotechnical aspects of developing the project as presently proposed.

The results of our study indicate that the site can be developed as planned, provided the recommendations of this report are followed. An update to this report should be performed once development plans have been finalized.

If you have any questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

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TABLE OF CONTENTS

1. PURPOSE AND SCOPE 1

2. SITE AND PROJECT DESCRIPTION 2
   - 2.1 Site 2
   - 2.2 Proposed Project 3

3. SOIL AND GEOLOGIC CONDITIONS 4
   - 3.1 Marine Beach Deposits (Qmb) 4
   - 3.2 Topsoil/Undocumented Fill (unmapped) 4
   - 3.3 Old Paralic Deposits (Qop_6) 5
   - 3.4 Torrey Sandstone (Tt) 5
   - 3.5 Del Mar Formation (Td) 6

4. GEOLOGIC STRUCTURE 6

5. EROSION AND BLUFF MORPHOLOGY 6

6. BLUFFTOP SETBACK 8
   - 6.1 Slope Stability 9
   - 6.2 Calculation of Historic Erosion Rate 12
   - 6.3 Consideration of an Increase in Erosion Due to the Effects of Sea Level Rise 14
   - 6.4 Recommended Setback 16

7. GROUNDWATER/SEEPAGE 16

8. GEOLOGIC HAZARDS 17
   - 8.1 Faulting 17
   - 8.2 Seismicity-Deterministic and Probabilistic Analysis 17
   - 8.3 Liquefaction 19
   - 8.4 Landslides and Bluff Instability 19
   - 8.5 Seiche and Tsunami Inundation 20
   - 8.6 Sea Level Rise 20

9. CONCLUSIONS 21
   - 9.1 General 21

10. RECOMMENDATIONS 24
   - 10.1 Grading 24
   - 10.2 Temporary Slopes, Shoring, and Tiebacks 26
   - 10.3 Corrosion 30
   - 10.4 Bluff Setback 31
   - 10.5 Seismic Design Criteria 31
   - 10.6 Preliminary Foundation Recommendations 33
   - 10.7 Concrete Slabs-on-Grade 34
   - 10.8 Retaining Walls and Lateral Loads Recommendations 35
   - 10.9 Low Impact Development 38
   - 10.10 Site Drainage and Moisture Protection 38
   - 10.11 Plan Review 39

LIMITATIONS AND UNIFORMITY OF CONDITIONS

TABLE OF CONTENTS (Concluded)

MAPS AND ILLUSTRATIONS
- Figure 1, Vicinity Map
- Figure 2, Parcel Map
- Figure 3, Geologic Map (Map Pocket)
- Figure 4, Geologic Structure Map (Map Pocket)
- Figure 5, Bluff Face Map (Map Pocket)
- Figures 6 – 11, Geologic Cross Sections A-A′ through Y-Y′ (Map Pocket)
- Figures 12 – 16, [Low-Altitude Oblique] Aerial Photographs of Bluff
- Figure 17, Bluff Retreat Exhibit (Map Pocket)
- Figure 18, Unique Geologic Setting North Beach (Map Pocket)
- Figure 19, Natural Sea Wall (Map Pocket)
- Figure 20, Determination of Project Setback Limits (Map Pocket)
- Figure 21, Historic Erosion Rate Based on Gazebo (Map Pocket)
- Figure 22, Historic Erosion Rate Based on 20 and 30-foot Elevation Contours (Map Pocket)
- Figure 23, 1932, 1953 Top of Bluff Determinations (Map Pocket)
- Figure 24, 2019 Top of Bluff Determination (Map Pocket)
- Figure 25, Comparison of 19032, 1953 and 2019 Bluff Top Positions and Erosion Rate Calculations (Map Pocket)
- Figure 26, Consideration of Sea Level Rise and Accelerated Bluff Retreat (Map Pocket)
- Figure 27, Recommended Setback (Map Pocket)
- Figure 28, Subaerial Erosion Exhibit (Map Pocket)
- Figure 29, Lateral Active Pressures for Temporary Shoring
- Figure 30, Lateral Active Pressures for Temporary Shoring – [2:1] Sloping Ground Surface
- Figure 31, Soldier Pile Passive Pressure Distribution
- Figure 32, Recommended Effective Zone for Tieback Anchors
- Figure 33, Wall/Column Footing Dimension Detail
- Figure 34, Typical Retaining Wall Drain Detail
- Figure 35, Soldier Pile Wall Drainage Detail
- Figure 36, Soil Nail Wall Drainage Detail

APPENDIX A
- FIELD INVESTIGATION
- Figures A-1 – A-3, Logs of Large-Diameter Borings
- Figures A-4 – A-14, Logs of Small-Diameter Borings
- Figures A-15 – A-19, Logs of Limited Access Borings
- Figures A-20 – A-21, Logs of Continuous Core Borings
- Figures A-22 – A-43, Logs of Exploratory Trenches

APPENDIX B
- LABORATORY TEST RESULTS
- Table B-I, Summary of Laboratory Maximum Dry Density and Optimum Moisture Content Test Results
- Table B-II, Summary of Laboratory Direct Shear Test Results
- Table B-III, Summary of Laboratory Expansion Index Test Results
- Figures B-1 – B-2, Gradation Curves
- Figures B-3 – B-15, Consolidation Curves
- Figures B-16 – B-18, Composite Direct Shear Test Results

TABLE OF CONTENTS (Concluded)

APPENDIX C
SLOPE STABILITY ANALYSES
Figures C-1 – C-41, Static Analysis
Figures C-42 – C-66, Seismic Analysis

APPENDIX D
BLUFF RETREAT ANALYSIS (by Mr. Michael Hart, C. E. G. No. 706)

APPENDIX E
THIRD-PARTY INDEPENDENT REVIEW (by Dr. Benjamin Benumof)

APPENDIX F
CALCULATIONS

APPENDIX G
RECOMMENDED GRADING SPECIFICATIONS

LIST OF REFERENCES

GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report presents the results of a geotechnical investigation for the proposed Marisol project, which includes multiple contiguous parcels of land totaling approximately 16.6 acres located in Del Mar, California (see *Vicinity Map,* **Figure 1**, and *Parcel Map*, **Figure 2**). The purpose of the study was to investigate the soil and geologic conditions at the site, as well as evaluate geotechnical constraints, if any, that could impact the proposed project.

This document is a compilation of information from our original investigation dated October 10, 2017, and subsequent studies/plan revisions that occurred during project design and a third-party peer review. This report also includes a new civil grading plan after project modification as well as a geotechnical re-evaluation of the slope stability analysis based on the revised grading configuration.

In addition to the revisions described above, Dr. Ben Benumof has provided a discussion of future sea level rise and its potential impacts on the subject property (APPENDIX E). Additional comments are also provided regarding historical erosion rates along the northern Del Mar shoreline.

This report provides recommendations relative to the geotechnical engineering aspects of the development as presently proposed based on the conditions encountered during this study, and our previous study on the center parcel which was presented in the report entitled, *Geotechnical Investigation, The Estates at Del Mar, Del Mar, California*, dated January 13, 2017.

The scope of our recent study consisted of the following:

- Reviewing aerial photographs, satellite imagery and readily available published and unpublished geologic literature.
- Obtaining monitoring well permits from the County of San Diego Department of Environmental Health and preparing a closure letter.
- Reviewing the digital grading plans prepared by Project Design Consultants.
- Performing geologic mapping and recording structural measurements of the bluff face along the perimeter of the site.
- Advancing eleven small-diameter borings and five limited access small-diameter borings to characterize the site soil and geologic conditions. Borings were also used to collect soil samples for laboratory testing to support the slope stability analysis (see APPENDIX A and B). The logs of three large-diameter borings performed during the previous study are also contained in APPENDIX A.

- Drilling two continuous core borings to aid in correlation of the geologic stratigraphy and in evaluating the geologic structure beneath the site (see APPENDIX A).

- Excavating eight exploratory trenches using a rubber tire backhoe to evaluate the underlying soil and geologic conditions within the northern portion of the site (see APPENDIX A). The logs of fourteen trenches performed during the previous study on the center property are also contained in APPENDIX A.

- Performing laboratory tests on selected soil samples collected to evaluate their physical properties (see APPENDIX B).

- Performing slope stability analyses along each of the twenty-five geologic cross sections (see APPENDIX C).

- Performing a site-specific bluff retreat study by Mr. Michael Hart using photogrammetric techniques and geo-referencing of recent and historic aerial photographs (see APPENDIX D).

- A third-party review and collaboration with Mr. Hart, and a review of our geologic information by Dr. Benjamin Benumof, a recognized expert in geological matters and bluff retreat (see APPENDIX E). In addition, Geocon responded to a third-party review by Environmental Science Associates (ESA), the City of Del Mar's peer review consultant. The results of that response are included herein.

- Preparing this report presenting our exploratory information and our conclusions and recommendations regarding the geotechnical aspects of developing the site as presently proposed.

The approximate locations of the exploratory borings and trench excavations are shown on the *Geologic Map*, **Figure 3**. The *Geologic Structure Map*, **Figure 4**, and *Bluff Face Map*, **Figure 5**, present the structural information obtained during our field investigation and geologic reconnaissance. *Geologic Cross-Sections* A-A′ through Y-Y′, **Figures 6 through 11**, represent our interpretation of the geologic conditions underlying the site. These oversized figures are contained in the map pockets in the back of this report.

2. SITE AND PROJECT DESCRIPTION

The approximate 16.6-acre site is located southwest of the intersection of Camino Del Mar (Highway 101) and Via De La Valle/Border Avenue in Del Mar, California. A parcel exhibit showing the various property configurations is presented on **Figure 2**.

2.1 Site

The triangular-shaped site is situated on a bluff-top overlooking the Pacific Ocean with descending slopes on its west and east sides. The individual parcels comprising the project have supported various structures over the years. The information described below is based our review of aerial photographs from 1932 to present and our understanding of the historical use of the properties.

The northern portion of the site (Whalen property) previously supported at least three main residential structures. The structures have since been removed and the property currently consists of open land with ice plant, grasses, several mature palm trees and three abandoned telephone poles and lines. This property is accessed from the west end of Border Avenue and has served as public parking for local events.

The central property (Lazier property) supported several structures, including two separate residential homes, a pool and pool house, along with other ancillary buildings that have since been demolished and removed from the site. A gazebo, located on the bluff top at the west end of this property, was instrumental in calculating the site-specific bluff retreat rate. A man-made viewing platform and fireplace are still present along the top of the bluff. Several mature trees and landscaping exist throughout this parcel. Ingress and egress to the property is provided by a private access road that parallels Camino Del Mar along the east property margin.

The southern portion of the site (Gilbert property) supports an occupied 5,800 square-foot, single-story residence and guest house with a pool and landscaping. Aerial photographs indicate that the residence was constructed after 1979. Access to the property is from a private access road that serves the adjacent property. A 1972 aerial photograph shows an area south of the Gilbert property that previously accommodated several single-story dwellings at the southerly tip of the bluff. These structures were located south of the proposed resort development property.

Topographically, the site consists of a nearly flat, to slightly convex shaped mesa with descending natural slopes along the east and west side of the properties. Elevations range from approximately 93 feet Mean Sea Level (MSL) in the northern portion of the site to approximately 0 feet MSL at the base of the cliff to the west.

2.2 Proposed Project

It is our understanding the proposed project will consist of 65 hotel guest rooms, 27 attached villas and 4 detached villas each with an amenity building. The main hotel building would be located in the southerly portion of the project with guest rooms situated toward the center of the site. Other improvements include swimming and spa pools, three restaurants, meeting and event space, public access amenities, a spa and fitness center, and 408 parking spaces, which includes underground parking. It is understood that the proposed buildings would not exceed 3 stories.

A perimeter emergency vehicular access road and pathway is proposed around the development and may be designed to contain underground utilities such as drainage, sewer, and water improvements. It is understood that the road will be designed to accommodate fire truck vehicular loading. The area south of the project is dedicated as a public park overlooking the Pacific Ocean, Del Mar North Beach

("Dog Beach") and the terminus of the San Dieguito River. The main access to the hotel would be from Border Avenue at its intersection with South Sierra Avenue.

Based on a review of the preliminary earthwork exhibit, grading will consist of excavating approximately 106,000 cubic yards of soil and filling approximately 63,000 cubic yards, resulting in approximately 43,000 cubic yards of export. However, these estimates are geometric and do not account for remedial grading, bulking and shrinking of the materials, on-site utility spoils or undercuts of proposed onsite streets/drives. The proposed pads will require maximum cut and fill depths on the order of approximately 26 feet (below grade parking) and 28 feet, respectively.

The descriptions of the site and proposed improvements are based on a site reconnaissance, a review of available plans and figures provided for our use, and our general understanding of the project as presently proposed. If project details vary significantly from those described above, or if the agency requirements differ than those anticipated, Geocon Incorporated should be retained to update and/or modify this report accordingly.

3. SOIL AND GEOLOGIC CONDITIONS

The geologic units encountered or mapped on the property include marine beach deposits, topsoil/undocumented fill, Old Paralic Deposits (also referred to as terrace deposits), Torrey Sandstone and Del Mar Formation. Each of the units is described below in order of increasing age. Their mapped extent (with the exception of topsoil/undocumented fill) is shown on the *Geologic Map*. In addition, a brush pile was mapped along the northern portion of the bluff and is identified as Qbp on **Figure 3**. A review of historical photographs indicates that the brush has been present since at least 1972. The geologic conditions exposed in the bluff face are also shown on aerial photographs, **Figures 12 through 16**.

3.1 Marine Beach Deposits (Qmb)

Unconsolidated beach deposits are present at the base of the cliffs along the western and southeastern property boundary. The deposits consist of fine to medium grained sand that have been placed by the ocean and/or San Dieguito River, or eroded from the geologic formations exposed in the sea cliff. These materials are not expected to be encountered during site development.

3.2 Topsoil/Undocumented Fill (unmapped)

Topsoils blanket the majority of the site and vary in thickness from approximately 2½ to 6 feet. The topsoil is characterized as loose, dry to damp, medium to dark brown, silty, fine sand. Several trenches encountered a significant number of roots and other organics associated with landscape vegetation. In

addition, backfill associated with a network of irrigation pipes and shallow utility lines is present within the topsoil and upper portions of the Old Paralic Deposits.

Undocumented fill is present on the central parcel (Lazier) and is associated with demolition and backfill of the basements and foundations from the previously existing structures and swimming pool. These fill prisms may extend up to 10 feet below the existing ground surface. In addition, septic systems adjacent to former structures (and/or undocumented fills associated with them) may be encountered during grading. The general locations of previous and existing structures are shown in yellow on the *Geologic Map*.

Topsoils and undocumented fill deposits are considered unsuitable in their present condition and will require removal and compaction in areas of planned development. In addition, all remaining irrigation and shallow utility lines will also require removal and disposal off-site.

3.3 Old Paralic Deposits (Qop_6)

Late to Middle Pleistocene-age Old Paralic Deposits, commonly referred to as Terrace Deposits, were encountered in all of the exploratory borings and trenches performed at the site. These deposits predominately consist of slightly to moderately cemented, medium dense to dense, orange to reddish brown, silty, fine to medium sand. The upper portions of this deposit contain thin horizontal bands of reddish-brown translocated clay films and iron deposits as observed down-hole in the borings, and in the bluff face (see **Figures 12 through 16**). The Old Paralic Deposits are suitable to support the proposed structures either in a natural or properly compacted condition.

Portions of this unit have little to no cohesion and are susceptible to caving where exposed in excavations and/or steep slopes as observed in Boring Nos. LB-1 through LB-3. This condition limited our down-hole observations during the initial study. During project construction, flattening/sloping back of temporary excavations, or possibly shoring to maintain stable excavations will be required.

3.4 Torrey Sandstone (Tt)

The Middle Eocene-age Torrey Sandstone was observed underlying the Old Paralic Deposits throughout the majority of the project. Where encountered, the Torrey Sandstone consisted of dense to very dense, light brown, silty, fine to medium sandstone with varying degrees of cementation. Observation of this unit in the bluff face and in the samples from the borings suggests that its thickness decreases beneath the southern portion of the site. Where exposed along the beach to the north, the Torrey Sandstone is generally well cemented and forms a robust and resistant face along the base of the sea cliff.

3.5 Del Mar Formation (Td)

The Middle Eocene-age Del Mar Formation underlies the Torrey Sandstone throughout the site except in the vicinity of Boring LA-2 where the Torrey Sandstone was not encountered. Since the Torrey Sandstone pinches out to the south, the Old Paralic Deposits conformably overly the Del Mar Formation in the southern portion of the site explaining The conditions encountered in LA-2. This relationship can also be seen in the bluff face. The Del Mar Formation consists of cemented, very dense, damp to moist, yellowish brown to grayish green, silty, fine to medium sandstone with some interbeds of dark grey siltstone and claystone observed along the bluff face. A prominent cemented marine fossil bed was observed within this unit along the beach at the southern portion of the site and in the nearshore. Like the Torrey Sandstone, this unit also forms a robust and resistant face at the base of the seaward cliff face.

4. GEOLOGIC STRUCTURE

Bedding observed down-hole, and in the bluff face within the Old Paralic Deposits was generally horizontal. Our measurements indicate that the contact and bedding within the Torrey Sandstone and Del Mar Formation is striking generally northwest-southeast and dips between 3 to 14 degrees into the face of the sea cliff, a condition that is favorable with regard to the stability of the sea bluff. The abrasion surface, on which the Old Paralic Deposits was deposited, varied from relatively flat to dipping approximately 4 degrees to the west. This conclusion is based on our structural measurements taken along the coastal bluff face and the contact elevations noted within the exploratory borings. An elevation contour plot of these surfaces is presented in red and green on the *Geologic Structure Map*. These features are also shown on the *Geologic Cross Sections*.

Our overall geologic reconnaissance also included traversing the western margin of the site along the beach to identify and record geologic contact elevations and collect structural attitudes of faults, bedding, joints and the general trend and depth of the sea caves (see *Bluff Face Map*). A rose diagram and stereonet plot showing the trend distribution and a contour of the poles of the primary joint orientations along the bluff face is presented on the *Geologic Structure Map* and *Bluff Face Map*. The diagrams reveal that these features are steeply dipping and striking generally northeast-southwest.

5. EROSION AND BLUFF MORPHOLOGY

Two bluff areas are present on the west and east margins of the site. The morphology of these features is indicative of the geologic materials that comprise the slopes and their exposure to erosion from wind, rain, and the Pacific Ocean. A detailed study of the bluff erosion rate for the west-facing slope was performed by Mr. Michael Hart and is presented in APPENDIX D. Mr. Hart utilized a topographic map prepared by Project Design Consultants which shows the present bluff conditions and the conditions present in 1953 (**Figure 17**). In addition, our study was expanded to consider a time period from 1932 to 2019. A review of this study, as well as additional professional opinions regarding

bluff erosion was provided by Dr. Benjamin Benumof and is presented in APPENDIX E. Five low-altitude oblique aerial photographs of the western bluff are presented on **Figures 12 through 16**. The following is a general discussion of erosion and bluff morphology.

The northern portion of the bluff facing Camino Del Mar is comprised of Old Paralic Deposits. Although this slope appears to have been man made prior to 1953, erosion over the years has resulted in a relatively uniform surface profile. Our observations during past rainy seasons indicated that some shallow "skin failures" occurred along the slope face during periods of heavy rainfall. These failures were localized and on the order of a few inches to one-foot-thick. The base of the southern portion of this slope exposes Torrey Sandstone and the Del Mar Formation which are more resistant to weathering than the overlying Old Paralic Deposits. This area forms a slightly southeastward protruding bulge at the toe of the slope.

The west-facing bluff exposes similar geologic units as the east facing slope with the upper portions being comprised of approximately 30 to 50 feet of Old Paralic Deposits. These materials are underlain by Torrey Sandstone and the Del Mar Formation which make up the lower approximately 30 feet of the cliff. The Eocene units have a greater exposure thickness on the west-facing bluff than the east facing bluff and are subject to wave action from the Pacific Ocean as well as wind and rain.

Morphologically, the Old Paralic Deposit portion of the bluff, which is primarily subjected to wind and rain erosion, exhibits a relatively uniform slope with several cusp-shaped features indicative of shallow rotational failures and crest retreat. The slope face in this deposit is inclined at a lower angle compared to the underlying Eocene units due to differential erosion. The bowl-shaped areas along the bluff top may have resulted from the uncontrolled flow of water over the slope, or from ordinary rain runoff over time that is directed over the slope since the existing topography is inclined gently westward from the center of the site. This slightly convex site topography, and the resulting westward conveyance of rain runoff, could be increasing the current rate of crest retreat of the bluff top compared to other adjacent areas where the surface runoff is controlled. **Figures 14, 15, and 28** reveal rivulets, surface erosion, and soil staining along the slope face from surface runoff overtopping the bluff.

The base of the west-facing cliff exposes much stronger and locally cemented Eocene deposits which protrude westward forming a steeper and more robust profile as seen in the *Geologic Cross Sections* and **Figures 6 through 11**. This portion of the cliff is subjected to wind, rain and ocean wave erosion and is more resistant to retreat due to its strength properties as evidenced from our laboratory test results. The Eocene units form a unique geologic setting compared to north and south of the project site and act as a natural sea wall due to their strength (see **Figures 18 and 19**). Our observations indicate that the primary failure mode within the Eocene units is toppling along bluff-parallel joints.

Figures 14 through 16, and 18 and 19 show several areas where blocks of these formations have toppled onto the beach.

The convex site topography appears to be contributing to an increased erosion rate along the bluff top by directing water over the top of slope during rain events as discussed below (see **Figures 15, 16, and 28**). Observations of the bluff morphology during our reconnaissance, and as revealed on the cross sections, indicate that the upper portions of the cliff which exposes Old Paralic Deposits is inclined at a much lower angle than the base of the cliff which exposes stronger Eocene units. It is our opinion that this is occurring due to the low to moderate cementation of these deposits and their propensity for shallow exfoliation and brittle planar failures due to shear and tensile stresses, respectively.

It should be noted that the Old Paralic Deposit portion of the bluff on the western side of the site, which appears to be the controlling geologic unit with respect to crest retreat, is well elevated above sea level (approximately 30 feet) and not subjected to sustained ocean wave erosion. As discussed later in this report, future sea level rise is not expected to adversely affect wave induced erosion of the Old Paralic Deposit.

6. BLUFFTOP SETBACK

Because the bluff is subject to landslide potential and erosion over time, the combination of slope stability analyses and the estimated erosion rate determines the blufftop setback. The project was analyzed in accordance with the City of Del Mar requirements (Municipal Code 30.55.090 Subsection B):

"All applications for projects involving new construction on properties containing coastal bluffs shall be accompanied by a geotechnical report addressing: 1) existing conditions; 2) the suitability of the site for the proposed construction; and 3) the potential of the proposed development to affect bluff stability over a 70-year life span of the project; 4) the potential future need for shoreline protection during an expected 70-year life span of the project; 5) an analysis of bluff retreat and coastal stability for the project site, according to accepted professional standards; 6) an analysis of the potential effects on bluff stability of rising sea levels, using latest scientific information; 7) an analysis of the potential effects of past and projected El Niño events on bluff stability; and 8) an analysis of whether the affected section of coastline is under a process of retreat. The report shall also include recommended mitigation measures as they relate to avoidance of risks and preservation of fragile bluff systems. In the event that a submitted report recommends a coastal bluff top setback of a greater distance than otherwise minimally required in this Chapter [40 feet], the greater distance shall be provided. In addition, for new development, the applicant shall acknowledge a waiver of all rights to future protective devices for the new development through recordation of a deed restriction as a condition of permit approval."

Thus, this analysis determined the setback at which the project must be sited so that it is reasonably safe from failure and erosion over its lifetime, without having to propose any shore or bluff stabilization to protect the structure in the future.

The California Coastal Commission's (CCC) former staff geologist provided a policy memorandum for a workshop to the Commission in 2003 that detailed the methodology for this analysis. That memorandum was later published in 2005 (ref: Johnsson 2005). The CCC generally considers 75 years as the economic life of residential and commercial development. The CCC has found the best way to assure safe development is to find the distance from the bluff edge necessary to achieve a factor of safety of 1.5 today and add to that the expected bluff retreat over the next 75 years (see **Figure 20**). It is critical to look at both slope stability and the predicted rate of erosion when determining the bluff setback because as the bluff naturally continues to retreat, the location of a safe setback for slope stability will move inland. For the purpose of our evaluation, we have chosen to follow the CCC guidelines for determining a bluff setback.

6.1 Slope Stability

Slope Stability – Slope stability analyses considering the bluffs and proposed development were performed utilizing average drained direct shear strength parameters from the laboratory test results performed for this study, and previous on-site and adjacent studies.

Laboratory Testing – Laboratory tests were performed on relatively undisturbed and remolded samples of the prevailing lithologic units collected during our recent and previous studies. In addition, relatively undisturbed ring samples were carved from intact blocks of the Torrey Sandstone and Del Mar Formation and sheared since the initial test results were inaccurate because of sample disturbance. The laboratory test results are presented in APPENDIX B.

Two laboratory test results within the Old Paralic Deposits from nearby Geocon projects were used in our testing suite. It should also be noted that the prominent, highly cemented shell bed unit within the Del Mar Formation, which would significantly increase the strength of this unit, was not considered in our analysis.

Slope Stability Strength Parameters – Table 6.1.1 presents the soil strength parameters that were utilized in our slope stability analyses.

TABLE 6.1.1
SLOPE STABILITY STRENGTH PARAMETERS

Soil Condition	Angle of Internal Friction ϕ (degrees)	Cohesion c (psf)
Compacted Fill (Qcf)	28	300
Beach Deposits (Qmb)	28	0
Old Paralic Deposits (Qop_6)	34	300
Torrey Sandstone (Tt)	37	1,300
Del Mar Formation (Td)	39	1,700

Stability Analyses – Twenty-five cross sections were created to analyze the location along the bluff top where a calculated static factor of safety of 1.5 exists. The analyses utilized the computer software program SLOPE/W (2018) to calculate the factor of safety against deep-seated failure. This program uses conventional slope stability equations and a two-dimensional limit-equilibrium method. We also retained Helenschmidt Geotechnical, Inc. to perform a third-party review and static finite element analyses using the computer software Plaxis on four cross sections to compare with our limit-equilibrium results. The results of their analysis indicated that the proposed setbacks derived from two-dimensional limit equilibrium analysis, and considering the project bluff erosion rates, are suitable from a slope stability standpoint.

It is our opinion that a circular failure mode within the Quaternary-age Old Paralic Deposits is the primary mechanism of slope instability affecting the bluff top. Due to the dense and cemented nature of the Eocene units at the base of the cliff, the regional northeastward dip of the strata, the lack of observed low angle sheared bedding planes and our historic observations of bluff instability in the area, the slope stability search envelope considering circular failure surfaces was generally limited to the Old Paralic Deposits. The analyses for Cross-Sections A-A' through H-H', L-L' through O-O', Q-Q' through S-S', and V-V' through Y-Y' demonstrate that, although a circular failure mode is not likely within the Eocene units, when analyzed, the 1.5 factor of safety line is unchanged and controlled by the circular failure surfaces forced through the Old Paralic Deposits.

For our analysis, Spencer's Method for circular-type failure modes was used to evaluate the lowest computed factor of safety as well as the location along each section where a static factor of safety of 1.5, or pseudo-static factor of safety of 1.1 occurred, whichever was greater. A pseudo-static acceleration of 0.15g was used to evaluate seismic slope stability. The output files and calculated factor of safety for the cross sections are presented in APPENDIX C, **Figures C-1 through C-66**. Our interpretation of the 1.5 factor of safety line is presented in red on the *Geologic Map*. A summary of the slope stability analyses performed is shown on Table 6.1.2.

TABLE 6.1.2
SLOPE STABILITY SUMMARY

Cross Section	Figure Number	Condition Analyzed	Factor of Safety	
			Static	Seismic
A-A’	C-1 & C-42	Circular Failure through Qop_6	1.6	1.2
B-B’	C-2	Circular Failure through Qop_6 – No Setback	1.2	---
	C-3 & C-43	Circular Failure through Qop_6 – With Setback	1.5	1.1
C-C’	C-4	Circular Failure through Qop_6 – No Setback	1.1	---
	C-5 & C-44	Circular Failure through Qop_6 – With Setback	1.5	1.1
D-D’	C-6 & C-45	Circular Failure through Qop_6	1.5	1.2
E-E’	C-7	Circular Failure through Qop_6 – No Setback	1.0	---
	C-8 & C-46	Circular Failure through Qop_6 – With Setback	1.5	1.1
F-F’	C-9	Circular Failure through Qop_6 – No Setback	1.4	---
	C-10 & C-47	Circular Failure through Qop_6 – With Setback	1.5	1.2
G-G’	C-11	Circular Failure through Qop_6 – No Setback	1.3	---
	C-12 & C-48	Circular Failure through Qop_6 – With Setback	1.5	1.2
H-H’	C-13	Circular Failure through Qop_6 – No Setback	1.3	---
	C-14 & C-49	Circular Failure through Qop_6 – With Setback	1.5	1.2
I-I’	C-15	Circular Failure through Qop_6 – No Setback	1.2	---
	C-16 & C-50	Circular Failure through Qop_6 – With Setback	1.5	1.2
J-J’	C-17	Circular Failure through Qop_6 – No Setback	1.0	---
	C-18 & C-51	Circular Failure through Qop_6 – With Setback	1.5	1.1
K-K’	C-19	Circular Failure through Qop_6 – No Setback	1.2	---
	C-20 & C-52	Circular Failure through Qop_6 – With Setback	1.5	1.2
L-L’	C-21	Circular Failure through Qop_6 – No Setback	1.1	---
	C-22 & C-53	Circular Failure through Qop_6 – With Setback	1.5	1.2
M-M’	C-23	Circular Failure through Qop_6 – No Setback	1.4	---
	C-24 & C-54	Circular Failure through Qop_6 – With Setback	1.5	1.2
N-N’	C-25 & C-55	Circular Failure through Qop_6	1.7	1.3
O-O’	C-26 & C-56	Circular Failure through Qop_6	1.7	1.3
P-P’	C-27 & C-57	Circular Failure through Qop_6	1.8	1.4
Q-Q’	C-28	Circular Failure through Qop_6 – No Setback	1.4	---
	C-29 & C-58	Circular Failure through Qop_6 – With Setback	1.5	1.2
R-R’	C-30 & C-59	Circular Failure through Qop_6	1.5	1.2
S-S’	C-31	Circular Failure through Qop_6 – No Setback	1.3	---
	C-32 & C-60	Circular Failure through Qop_6 – With Setback	1.5	1.2
T-T’	C-33	Circular Failure through Qop_6 – No Setback	1.2	---
	C-34 & C-61	Circular Failure through Qop_6 – With Setback	1.5	1.1

TABLE 6.1.2 (Concluded)
SLOPE STABILITY SUMMARY

Cross Section	Figure Number	Condition Analyzed	Factor of Safety	
			Static	Seismic
U-U'	C-35	Circular Failure through Qop_6 – No Setback	1.3	---
	C-36 & C-62	Circular Failure through Qop_6 – With Setback	1.5	1.1
V-V'	C-37	Circular Failure through Qop_6 – No Setback	1.2	---
	C-38 & C-63	Circular Failure through Qop_6 – With Setback	1.5	1.1
W-W'	C-39 & C-64	Circular Failure through Qop_6	1.9	1.4
X-X'	C-40 & C-65	Circular Failure through Qop_6	1.6	1.3
Y-Y'	C-41 & C-66	Circular Failure through Qop_6	1.7	1.3

6.2 Calculation of Historic Erosion Rate

Resistance to bluff erosion depends on soil mineralogy, degree of cementation, structural features such as the degree of faulting and jointing, and the presence or absence of geologic features such as weak or sheared clay seams. The lower portions of the Marisol bluffs are comprised of competent, erosion resistant Torrey Sandstone which is underlain by dense, cemented, shell-bedded Del Mar Formation (see **Figures 18 and 19**). This cemented shell-bedded unit is also prevalent in the nearshore.

For completeness, we studied and compared the erosion rates recorded in the literature for nearby sites with similar geologic units and a differing surface topography. It was discovered that the sites to the north and south possess relatively less competent Del Mar Formation and Torrey Sandstone (i.e. different lithology with less strength, more fracturing and/or adverse geologic features and landslides) and differing surface topography which render these locations not suitable for erosion rate comparisons. The lower rock strength, and in some instances the presence of adverse geologic features at these sites, result in higher erosion rates than the Marisol property. For this reason, we discounted the adjacent information and chose to perform an exclusive, site-specific study to evaluate blufftop recession on the Marisol property.

Several methods were utilized to calculate the site-specific historic erosion rate on the property. Our evaluation of bluff retreat was performed by Mr. Michael Hart and initially utilized historic retreat rates determined from 30 measurements along the "coastal bluff-top" and a circular gazebo foundation that was located in the central parcel over a time period from 1953 to 2016 (63 years, see report in APPENDIX D and **Figures 17 and 21**). The photogrammetric information used in Mr. Hart's analysis was provided by Project Design Consultants (see Bluff Retreat Exhibit, **Figure 17**). This evaluation yielded a historic retreat rate of 0.16 ft./yr. using 30 site-specific transects and 0.19 feet per year using the gazebo location.

A third-party review of this analysis was performed by Dr. Benjamin Benumof, a recognized expert in geological matters and bluff retreat. Dr. Benumof consulted with Mr. Hart regarding his methodology and compared the results with his own research (Benumof and Griggs, 1999; Benumof and others, 2000). Dr. Benumof found that the bluff retreat rates determined by Mr. Hart were slightly less but reasonably consistent than the results of his research. Dr. Benumof's opinion paper is contained in APPENDIX E.

A calculation of site-specific bluff erosion evaluation was also performed based on the 20-foot and 30-foot elevation contours from 1953 and 2016 (see **Figure 22**). The 30-foot elevation contour roughly coincides with the contact between Terrace materials and Eocene deposits below and the 20-foot contour is within the Eocene Deposits. The combination of blufftop, 20-foot contour, and 30-foot contour provides a representative range of bluff face and blufftop positions for comparison. The calculated erosion rate for these contour intervals is 0.18 ft./yr. and 0.17 ft./yr., respectively.

As a means of expanding the time frame of our historic erosion rate study, an aerial flight of the property was commissioned in February, 2019, to produce an orthophotograph of the site with an accuracy of 6 inches. We also obtained stereo-pairs of 1932 aerial photographs to expand our study range to 87 years. A photogrammetrist was retained to geo-reference the historic aerial photos from 1932 (**Figure 23**) and 1953 (**Figure 23**), with the 2019 (**Figure 24**) orthophotograph and measure the difference in bluff top positions at 20-foot intervals along the blufftop. The only exception in our comparison occurred in the extreme northern portion of the site where we did not measure the erosion rate between 1932 and 1953 because of extensive grading at the top of bluff prior to 1953 to create a road and path to the beach and a flat graded pad at the top of bluff just south of the northern property line.

The georeferencing process aligns points in common (typically man-made features) between the orthophoto and the historic aerial photographs. The final product results in reshaping the aerial photograph so that it has a scale that allows an accurate overlay with the 2019 orthophoto. Once that is accomplished it permits accurate comparison and measurement of the difference in bluff edge location on both photographs. The accuracy of the bluff edge determination for the recently commissioned orthophoto is 6 inches. The accuracy of the bluff edge location on the 1953 aerial photography is estimated to be +/- 3 feet. This is based primarily on the high degree of accuracy of the georeferencing procedure and the excellent quality of the photos.

Our interpretation of the bluff top positions for 1932, 1953, and 2019 are presented on **Figure 25**. The calculated average retreat rates and the location of measurements of bluff recession recorded at 20-foot intervals along the length of the bluff top are also shown. These positions are based on stereo pair analysis and georeferenced aerial photography. The 2016 top of bluff line originally used in our study was determined from the project topographic map. For the position of the modern bluff edge we

utilizing an orthophotograph flown in February, 2019, specifically to allow more accurate geo-referencing of the 1932 and 1953 historic aerial photos.

The calculation of the bluff recession rate from 1932 to 2019 utilizing the geo-referenced aerial photos is **0.17 ft./yr.** (+/- 0.04 ft./yr.). The recession rate we determined for the period 1932 to 1953 is 0.44 ft./yr., a rate that is over five times the 0.08 ft./yr. rate we determined for the 1953 to 2019-time period. In our opinion there is no rationale for expecting that the actual recession rate for the 21-year period between 1932 and 1953 to be over five times the rate for the more accurately measured 1953 to 2019-time period. This anomaly can be explained by the less accurate georeferencing of the 1932 photos because the 1932 photographs had fewer points in common with the 2019 orthophoto and the 1953 aerial photographs.

To be conservative, we utilized a bluff recession rate for project design that includes the higher, less accurate, rate of recession for the period 1932 to 2019 (**0.17 ft./yr.**) rather than the more accurate rate determined for the period of 1953 to 2019. In our opinion the use of this rate represents a conservative estimate of the historic rate of bluff recession for the site because it is the longest time-period, therefore, best taking into account the temporal variability in coastal bluff erosion. In addition, we consider this rate (0.44 ft./yr.) to be unrepresentative of the long-term erosion history of the project site for several reasons. First, while the 1932 photos are very useful and accurate, the geo- referencing of these photos is somewhat limited because fewer common reference points exist on these older images. Second, the time period between the 1932 and 1953 is only 21 years as opposed to 87 years (nearly a century) between 1932 and 2019.

6.3 Consideration of an Increase in Erosion Due to the Effects of Sea Level Rise

Our initial study applied a 1.5 factor of safety multiplier to the historic erosion rate calculation to account for the effects of sea level rise on the future erosion rate. This procedure is suggested in the California Coastal Commission guideline Memorandum W11.5. (2003). It was subsequently pointed out that, while the Commission has accepted a “multiplier” approach in the past, this method is not endorsed or recommended in the Sea Level Rise Guidance literature when other, science-based approaches are available. As a consequence, several other sea level rise models were considered.

Given the regional nature and the low accuracy of the erosion rates identified in several of the sea level rise models, and the fact that the rates are not necessarily intended to be used for site-specific analyses, the selected model used to calculate the effects of sea level rise on the future rate of bluff retreat at Marisol is the Simple Equation method. It should be noted that the current version of the Simple Equation is more appropriate for soft cliff shorelines (unlike the Marisol site).

The Simple Equation is $\mathbf{R_2 = R_1 (S_2 / S_1)^{1/2}}$ where R_2 = Future rate of bluff retreat, R_1 is historical bluff retreat rate, S_2/S_1 is the ratio of future (anticipated) sea level rise rate to historical sea level rise rate. The use of the simple equation has been recognized as a conservative estimate of future bluff retreat by the CCC (team member communication with CCC) in the San Diego area. As noted, the current version of the equation is intended for evaluation of soft cliff retreat which is a conservative assumption considering the lithified nature of the onsite lower bluffs at Marisol. For evaluation of historical sea level rise, we have utilized the 1932 to 2019-time period because, as previously cited, this appears to provide a conservative erosion estimate using site-specific data for a multi-decadal analysis.

In addition, we have utilized historical sea level data from Scripps Pier in La Jolla to establish historical sea level rise for the same period. Detailed calculations for the Simple Equation are provided on **Figure 26**. The sea level data from Scripps Pier in La Jolla was only available through 2017, and is presented in APPENDIX F. We have assumed that the difference in the trend-line for 1932-2017 sea level rise vs. 1932-2019 sea level rise is negligible. Table 6.3 below sets forth setback criteria assuming Simple Equation derived bluff retreat. For total retreat we have averaged historical and future rates of bluff retreat and multiplied by the project design life. This averaging methodology has previously been accepted by the CCC (team member communication with CCC). **Figure 26** presents projected future bluff positions and associated Simple Equation calculations, as well as our original recommended setback, based on the 1.5 multiplier method.

TABLE 6.3
ESTIMATED BLUFF RETREAT AND SETBACK CONSIDERING SEA LEVEL RISE (75 YEARS) USING SIMPLE EQUATION

Scenario	Historical Sea Level Rise Rate (ft/yr) S_1	Historical Bluff Retreat Rate (ft/yr) R_1	Future Estimated Sea Level Rise Rate (ft/yr) S_2	Future Bluff Retreat Rate (ft./yr.) R_2	Mean annual bluff retreat rate, 2019-2100 (ft./yr.)	75-year bluff retreat (ft)
Low risk aversion-17 percent probability of exceedance (high emissions)	0.007	0.17	0.055	0.48	0.325	24
Medium-High risk aversion- 0.5 percent probability of exceedance (high emissions)	0.007	0.17	0.124	0.72	0.445	33
Extreme Risk Aversion – H++ Scenario (single scenario, no associated probability)	0.007	0.17	0.177	0.85	0.512	38

As recommended by the CCC's Sea Level Rise Policy Guidance (2018 update), we have analyzed bluff retreat based on three scenarios: (1) the low risk aversion scenario with a 17 percent probability of exceedance (also referred to as OPC's 66% probability scenario) under a high emission scenario; (2) the medium-high risk aversion scenario with a 0.5 percent probability of exceedance for projected sea level rise per the Ocean Protection Council (OPC) 2018 under a high emission scenario; and (3) the extreme risk aversion H++ scenario.

The 0.5 percent probability of exceedance scenario setback is recommended for all primary structures associated with the project. As such, the primary structures have been planned to the medium-high risk aversion scenario's bluff setback range. Since the likelihood that sea-level rise will meet or exceed this value is low, planning for this scenario provides a precautionary approach, as recommended by both OPC and CCC's sea level rise guidance documents. A precautionary approach should be used when project components are less adaptive and more vulnerable, such as the proposed resort housing. By using the medium-high risk aversion scenario to calculate the blufftop setback range, these principal structures will be built to assure structural stability for 75 years without the reliance of new bluff or shoreline protection measures. The blufftop setback range for medium-high risk aversion structures is 43 to 95 feet and can be seen on **Figures 26 and 27**.

As noted, the CCC's sea level rise guidance document recommends taking a precautionary approach, which includes designing projects for local hazard conditions but analyzing higher and more extreme unlikely sea level rise projections to plan for future adaptation, as necessary. As such, we also evaluated the H++ scenario in order to understand what the worst case scenario for the life of the structure would be, as seen in Table 6.3.

6.4 Recommended Setback

The future rate of bluff retreat assuming the Simple Equation with a 0.5 percent probability of exceedance sea level rise under a high emission scenario (medium-high risk aversion), equates to **33 total feet of retreat in a 75-year span**.

7. GROUNDWATER/SEEPAGE

Groundwater/seepage or wet conditions were observed approximately 70 to 90 feet below the existing ground surface in Borings LB-2, LB-3, SB-4, SB-6, SB-9, SB-10, LA-5 and CC-2, generally corresponding to sea level. Water was not observed seeping along the base of the terrace deposits, or contacts between permeable and impermeable layers within the Eocene units as occurs in other surrounding areas where up-slope sources of water are present. Due to the depth of the groundwater/seepage, these conditions should not impact the proposed development of the property.

8. GEOLOGIC HAZARDS

8.1 Faulting

Based on our reconnaissance and a review of published geologic maps and reports, the site is not located on any known "active" or "potentially active" fault traces as defined by the California Geological Survey (CGS). Several presumed to be inactive minor faults were identified within the Torrey Sandstone and Del Mar Formation in the bluff face. These features offset Eocene stratigraphy but do not break the overlying Old Paralic Deposits and, therefore, are not considered potential ground rupture hazards (see *Bluff Face Map*). These faults are generally striking north to northeast and are steeply dipping with some vertical offsets down to the east.

The Newport-Inglewood Fault and Rose Canyon Fault Zone, located approximately 2 miles west of the site, are the closest known active faults. The CGS considers a fault seismically active when evidence suggests seismic activity within roughly the last 11,000 years. The CGS has included portions of the Rose Canyon Fault zone within an Alquist-Priolo Earthquake Fault Zone. Based upon a review of available geologic data and published reports, the site is not located within a State of California Earthquake Fault Zone.

8.2 Seismicity-Deterministic and Probabilistic Analysis

We used the computer program *EZ-FRISK* (Version 7.65) to determine the distance of known active faults to the site and to estimate ground accelerations at the site for the maximum anticipated seismic event.

According to the results of the computer program *EZ-FRISK* (Version 7.65), 8 known active faults are located within a search radius of 50 miles from the property. Acceleration attenuation relationships developed by Boore-Atkinson (2008) NGA USGS2008, Campbell-Bozorgnia (2008) NGA USGS, and Chiou-Youngs (2008) NGA were used in our analysis. The nearest known active faults are the Newport-Inglewood and Rose Canyon Fault Zones, located approximately 2 miles west of the site and are the dominant sources of potential ground motion. Table 8.2.1 lists the estimated maximum earthquake magnitudes and PGA's for the most dominant faults for the site location calculated for Site Class D as defined by Table 1613.3.2 of the 2016 California Building Code (CBC).

TABLE 8.2.1
DETERMINISTIC SPECTRA SITE PARAMETERS

Fault Name	Distance from Site (miles)	Maximum Earthquake Magnitude (Mw)	Peak Ground Acceleration		
			Boore-Atkinson 2008 (g)	Campbell-Bozorgnia 2008 (g)	Chiou-Youngs 2008 (g)
Newport-Inglewood	2	7.5	0.41	0.38	0.50
Rose Canyon	2	6.9	0.38	0.39	0.45
Coronado Bank	16	7.4	0.21	0.15	0.19
Palos Verdes Connected	16	7.7	0.23	0.16	0.21
Elsinore	29	7.85	0.18	0.12	0.15
Earthquake Valley	42	6.8	0.09	0.06	0.05
Palos Verdes	43	7.3	0.11	0.07	0.07
San Joaquin Hills	47	7.1	0.09	0.08	0.07

We used the computer program *EZ-FRISK* to perform a probabilistic seismic hazard analysis. The computer program *EZ-FRISK* operates under the assumption that the occurrence rate of earthquakes on each mappable Quaternary fault is proportional to the faults slip rate. The program accounts for fault rupture length as a function of earthquake magnitude, and site acceleration estimates are made using the earthquake magnitude and distance from the site to the rupture zone. The program also accounts for uncertainty in each of following: (1) earthquake magnitude, (2) rupture length for a given magnitude, (3) location of the rupture zone, (4) maximum possible magnitude of a given earthquake, and (5) acceleration at the site from a given earthquake along each fault. By calculating the expected accelerations from considered earthquake sources, the program calculates the total average annual expected number of occurrences of site acceleration greater than a specified value. The acceleration-attenuation relationships suggested by Boore-Atkinson (2008) NGA USGS, Campbell-Bozorgnia (2008) NGA USGS, and Chiou-Youngs (2008) were used in the analysis. Table 8.2.2 presents the site-specific probabilistic seismic hazard parameters including acceleration-attenuation relationships and the probability of exceedence.

TABLE 8.2.2
PROBABILISTIC SEISMIC HAZARD PARAMETERS

Probability of Exceedence	Peak Ground Acceleration		
	Boore-Atkinson, 2007 (g)	Campbell-Bozorgnia, 2008 (g)	Chiou-Youngs, 2008 (g)
2% in a 50 Year Period	0.55	0.49	0.59
5% in a 50 Year Period	0.39	0.34	0.40
10% in a 50 Year Period	0.29	0.25	0.27

While listing peak accelerations is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including the frequency and duration of motion and the soil conditions underlying the site.

8.3 Liquefaction

Liquefaction is a phenomenon where loose, saturated, and relatively cohesionless soil deposits lose strength during strong ground motions. Primary factors controlling the development of liquefaction include intensity and duration of ground accelerations, characteristics of the subsurface soil, in situ stress conditions, and depth to groundwater. The potential for liquefaction occurring at the site is considered low due to the relatively dense nature of the underlying materials, remedial grading recommended, and lack of permanent near-surface groundwater.

8.4 Landslides and Bluff Instability

The sea bluff along the western side of the project site, and surrounding area, are occasionally subject to relatively minor bluff instability in the form of ongoing topples, block falls, circular slope failures and slope erosion. The site has been identified to be within Zone 4-1; described as "Most Susceptible" to these movements on the 1995 Landslide Susceptibility Map, Del Mar Quadrangle (Reference No. 22). These natural mass wasting conditions also occur along the coast in many other areas of greater San Diego north and south of the property.

Indications of surficial instability in the form of shallow rotational failures in the Old Paralic Deposits (terrace deposits) and topple-type movements of sandstone blocks in the Torrey Sandstone and Del Mar Formation were observed along the beach during our reconnaissance. These movements are relatively shallow and not considered indicative of deep-seated landsliding. Based on our close observations for over five years, the majority of the erosion of the bluff face appears to be occurring within the Old Paralic Deposits due to the weakly to moderately cemented sands that make up this unit and the uncontrolled flow of water over the bluff top. Observation of the Torrey Sandstone and Del Mar Formation reveals that bedding attitudes are favorably dipping into slope and toppling of blocks along bluff-parallel stress joints triggered by vibration from wave impact on wave-cut notches is the primary failure mode at the base of the cliff. The high strength of these formations has resulted in the robust and westward protruding profile that is exposed at the base of the cliff (see *Geologic Cross Sections*).

A development setback for the project has been established based on our slope stability analyses, calculated historic bluff retreat rates and the potential for sea level rise. The setback line is shown on the *Geologic Map*. In addition to our calculated setback criteria, the project planners should also consider jurisdictional requirements that may require a greater setback (e.g. 40-feet). Specific details concerning these factors are discussed in *Section 6.0, Blufftop Setback.*

8.5 Seiche and Tsunami Inundation

Based on our review of the Tsunami Inundation Map (Reference No. 15), and considering the site elevation in relation to sea level, the proposed development area (above elevation 70 Feet MSL) is not located within a tsunami inundation zone. The referenced map indicates that the lower portion of the cliff face could be exposed to a tsunami event. The site is not located downstream of any known lakes or storage tanks that could produce a seiche that would impact the proposed development.

8.6 Sea Level Rise

A discussion of future sea level rise and its potential impacts on the subject property is provided in *Section 6.3* and APPENDIX E by Dr. Benjamin Benumof.

9. CONCLUSIONS

9.1 General

9.1.1 Geotechnical Suitability – No soil or geologic conditions were observed that, in the opinion of Geocon Incorporated, would preclude the development of the property as proposed, provided the recommendations of this report are followed. The engineering design information presented herein is for preliminary planning purposes only and should be reviewed and updated, as necessary, once project plans proceed. An update to this report or a supplemental geotechnical design report should be prepared once detailed plans have been developed.

9.1.2 Bluff Erosion and Setbacks – The bluff portion of the property has been experiencing ordinary erosion and retreat over time due to natural mass wasting processes (i.e. toppling of jointed bedrock from wave action, relatively shallow surficial failures in the Old Paralic Deposits, etc.). Based on our observations, it is our opinion that a primary contributor to blufftop retreat at the Marisol site is subaerial erosion from surface runoff over the top of the slope, and to a lesser extent rain and wind effects on the bluff face (see **Figures 14, 15 and 28**). The project topography is convex-shaped so meteoric water hitting the ground surface flows from the center of the property westward and over the top of the bluff. The results of this flow are apparent on low angle oblique photographs that show numerous shallow gulley's on the face of the slope that are mainly attributable to runoff over the top of the bluff (see **Figure 28**). **Figure 28** also shows the change in surface gradient after project grading which reduces the westward runoff of meteoric water by 87 percent, hence significantly decreasing the subaerial erosion potential along the blufftop. To mitigate the effects of these natural processes, a setback from the bluff top (as shown on **Figures 3** and **26**) will be required in accordance with the City of Del Mar and California Coastal Commission requirements. Our recommendations based on our analysis will require review and approval by the governing agencies.

9.1.3 Unsuitable Soils and Materials – The proposed development area is underlain by topsoil/ undocumented fill deposits that are unsuitable for structural support in their present condition and will require remedial grading where improvements are planned. Some of the undocumented fill was placed within the swimming pool, septic tank, and basement removal excavations during demolition of the structures to provide a safe condition.

The precise location and geometry of the undocumented fill prisms, septic systems or other underground improvements are not known; therefore, supplemental investigation work will be necessary during grading to identify their actual location. Additional recommendations will be provided at that time, if necessary. The approximate location of the existing and

previous structures is shown on **Figure 3**. The actual extent of unsuitable soil removal will be determined in the field by the geotechnical engineer and/or engineering geologist.

A significant amount of vegetation (i.e. brush, palm trees, tree stumps, pine trees, etc.) is present throughout the project site. In addition, our trenching and field observations indicate that PVC irrigation lines and some utilities are also present. Significant effort may be necessary to remove these items, including roots, during brushing and remedial grading.

9.1.4 Ground Vibration During Construction – Excavations will be required to construct the underground parking facilities and other subsurface improvements. These excavations will be advanced onto the Old Paralic deposits which are relatively soft and should not generate ground vibrations that would propagate an appreciable distance within the terrace deposits. As a precaution, vibration monitoring should be performed along the bluff top area to check that the vibration levels are within tolerable limits.

9.1.5 Foundation Types – The proposed structures can be supported on a conventional foundation system consisting of isolated spread and continuous strip footings with slabs on grade supported entirely by Old Paralic Deposits or properly compacted fill.

9.1.6 Emergency Access Road – An emergency access loop road is planned around the perimeter of the development. It is understood that this road may contain deep underground utilities. As project plans progress, the design of these improvements will require review by Geocon to provide recommendations regarding the backfill of the utilities (e.g. cement slurry) to avoid any potential adverse impacts to the site slope stability if the road extends into this zone.

9.1.7 Site Irrigation and Drainage – Limiting site irrigation, establishing positive surface drainage, and maintaining leak-free improvements is imperative for the future performance of the site due to the potential adverse effects of water on slope stability. Drought-tolerant landscape improvements and water-tight pipes and pools incorporated into the project design will help minimize the effects of surface runoff and water infiltration.. In addition to proper surface drainage, shallow subsurface drains may be necessary to limit the amount of water infiltrating into the soil. Specific design recommendations can be provided once the development plans progress. Geocon should review and approve the project landscape and drainage plans from a geotechnical perspective prior to final engineering.

9.1.8 Excavation and Temporary Shoring – Excavation at the site should be achievable with conventional heavy construction equipment. Excavations up to approximately 26 feet for subterranean parking and possibly other buildings are anticipated for site development. Shoring and/or temporary excavations will be required around the proposed excavations. The low cohesive nature of the Old Paralic Deposits, and their propensity to cave, should be an important consideration when planning temporary excavations and the appropriate shoring systems. Earth loads and shoring design parameters are provided in *Section 11.2*.

10. RECOMMENDATIONS

The following geotechnical recommendations are provided based on the proposed preliminary development plans, design earthquake event and geotechnical conditions disclosed by our investigative testing and analysis. Once detailed foundation design and grading plans are available, additional recommendations will be required.

10.1 Grading

10.1.1 General – All grading should be performed in accordance with the attached *Recommended Grading Specifications* (APPENDIX G). Where the recommendations of this section conflict with APPENDIX G, the recommendations of this section take precedence. All earthwork should be observed and all fills tested for proper compaction by Geocon Incorporated.

10.1.2 Pre-Construction Meeting – A pre-construction conference with a City of Del Mar representative, owner, contractor, civil engineer, and geotechnical engineer should be held at the site prior to the beginning of grading. Special soil handling requirements can be discussed at that time.

10.1.3 Site Preparation – Prior to construction of the proposed improvements, the area of the proposed improvements should be cleared of surface and subsurface obstructions and debris including abandoned utilities, vegetation and foundation remnants. All topsoil and undocumented fill deposits within areas where structural improvements are planned should be removed to firm natural ground and properly compacted prior to placing additional fill and/or structural loads. The actual extent of unsuitable soil removals will be determined in the field during grading by the geotechnical engineer and/or engineering geologist.

It is anticipated that septic systems and/or seepage pits adjacent to the former structures may be encountered during the grading operations. It is recommended that, where encountered, the impacted soils and materials within and surrounding the leach field be removed and exported from the site.

Concrete and other generated debris should be removed from the site. Root pickers will likely be required during the grading operation to remove organic and trash debris.

Depressions or voids resulting from removal of buried obstructions should be filled with properly compacted fill material as described below.

10.1.4 Safety – It is the responsibility of the contractor to ensure that all excavations and trenches are properly shored and maintained in accordance with applicable OSHA rules and regulations in order to maintain safety and maintain the stability of adjacent existing improvements.

10.1.5 Excavation and Trenching – Excavation of the surficial deposits (topsoils and undocumented fill) and Old Paralic Deposits should be possible with light to moderate effort using conventional heavy-duty equipment. The Old Paralic Deposits were generally observed to be relatively cohesionless, therefore some sloughing and caving should be expected. The contractor should evaluate the necessity for reduced slope inclinations or shoring within this unit. The Torrey Sandstone and Del Mar Formation should not be encountered based on the anticipated grading for the site.

10.1.6 Onsite Soil Characteristics – The soil encountered in the field investigation is considered to be "non-expansive" (Expansion Index [EI] of 20 or less) as defined by 2016 California Building Code (CBC) Section 1803.5.3. Table 10.1 presents soil classifications based on the Expansion Index. The soil materials collected and tested for Expansion Index indicate a "very low" expansion potential (Expansion Index of 20 or less).

TABLE 10.1
EXPANSION CLASSIFICATION BASED ON EXPANSION INDEX

Expansion Index (EI)	ASTM 4829 Expansion Classification	2016 CBC Expansion Classification
0 – 20	Very Low	Non-Expansive
21 – 50	Low	Expansive
51 – 90	Medium	
91 – 130	High	
Greater Than 130	Very High	

In general, soils native to the site are suitable for re-use as fill if free from vegetation, debris, and other deleterious material.

10.1.7 Import Fill – Import fill (if necessary) should consist of granular materials with a "*very low*" to "*low*" expansion potential (EI of 50 or less) free of deleterious material or stones larger than 3 inches and should be compacted as recommended above. Geocon Incorporated should be notified of the import soil source and should perform laboratory testing of import soil prior to its arrival at the site to determine its suitability as fill material.

10.1.8 Fill Placement and Compaction – Prior to placement of fill excavation bottoms should be compacted to at least 90 percent relative compaction based on ASTM D1557. Fill material should be free of debris and deleterious matter and have no particles larger than 3 inches in maximum dimension. Oversize rock fragments should not be placed in structural fill areas.

Fill should be placed at near optimum moisture and in uniform horizontal lifts not exceeding 6 to 8 inches in loose lift thickness. Fill should be compacted to at least 90 percent of the maximum dry density as determined by ASTM D1557. The upper 12 inches of fill in areas to receive pavement should be compacted to at least 95 percent of maximum dry density. Utility trench backfill should be placed in lifts not exceeding 6 to 8 inches in loose lift thickness and compacted to at least 90 percent of the maximum dry density. Due to the granular nature of the majority of the on-site soils, compaction should most easily be achieved with vibratory equipment.

10.1.9 Overexcavation of Building Pads – To reduce the potential for differential settlement, it is recommended that the cut portion of cut/fill transition building pads be undercut at least 3 feet and replaced with properly compacted "very low" to "low" expansive fill soils. Where the thickness of the fill below the building pad exceeds 15 feet, the depth of the undercut should be increased to one-fifth of the maximum fill thickness.

10.2 Temporary Slopes, Shoring, and Tiebacks

10.2.1 Adjacent Improvements – Excavations to achieve basement/parking level grade will likely require vertical shoring due to the excavation depth and proximity of adjacent improvements. Deflection of the shoring system should be limited so as to not impact adjacent structures and improvements.

10.2.2 Shoring Design and Safety – The recommendations herein are provided for stable excavations and are submitted to the shoring and structural engineers to design a shoring system for the proposed excavations. The contractor should construct the temporary shoring system as designed by the project shoring engineer. The stability of the excavations is dependent on the design and construction of the shoring system. It is the sole responsibility of the contractor to provide a safe jobsite including safe excavation during the construction of the proposed project. Geocon Incorporated shall not be responsible for site safety and the stability of the proposed excavations.

The design of temporary shoring is governed by soil and groundwater conditions and by the depth and width of the excavated area. Continuous support of the excavation face can be provided by a system of soldier piles and wood lagging. However, sloughing of the vertical

excavation exposing the dry and relatively cohesionless sands of the Old Paralic Deposits should be expected and designed accordingly by the Shoring Contractor. Excavations exceeding 15 feet may require tie back anchors or internal bracing to provide additional wall restraint.

In general, ground conditions are poorly to moderately suited to soldier pile and tieback anchor construction techniques. Relatively dry and cohesionless sands should be expected within the excavations that will result in moderate to severe raveling of the unsupported excavation and caving of tie back borings. Casing, or shoring, should be expected due to the potential for caving conditions as observed within Boring Nos. LB-1 through LB-3 in the Old Paralic Deposits.

10.2.3 Temporary Slopes – Temporary slopes should be made in conformance with OSHA requirements. The Old Paralic Deposits can be considered Type C soil in accordance with OSHA requirements. In general, no special shoring requirements will be necessary if temporary excavations will be less than 4 feet in height. Temporary excavations greater than 4 deep, however, should be sloped at an inclination of 1 to 1 (horizontal to vertical) or flatter. These excavations should not be allowed to become saturated or to dry appreciably. Surcharge loads (including but not limited to equipment and stockpiled soils) should not be permitted for a distance equal to the depth of the excavation from the top of the excavation. The top of the excavation should be a minimum of 15 feet from the edge of existing improvements. Excavations steeper than those recommended or closer than 15 feet from an existing buildings and surface improvement should be shored in accordance with applicable OSHA codes and regulations.

10.2.4 Lateral Earth Pressures – For level backfill conditions behind the shoring system, temporary shoring should be designed using a lateral pressure envelope acting on the back of the shoring and applying a pressure equal to 32H, 21H, or 26H, for a triangular, rectangular, or trapezoidal distribution, respectively, where H is the height, in feet, of the shoring (resulting pressure in pounds per square foot) as shown in **Figure 29**. For a 2:1 (horizontal:vertical) sloping ground surface behind the wall, temporary shoring should be designed using a lateral pressure envelope acting on the back of the shoring and applying a pressure equal to 49H, 31H, or 39H, for a triangular, rectangular, or trapezoidal distribution, respectively (see **Figure 30**). Triangular distribution should be used for cantilevered shoring and the trapezoidal and rectangular distribution should be used for multi-braced systems such as tieback anchors and rakers. The project shoring engineer should determine the applicable soil distribution for the design of the temporary shoring system. Additional lateral earth pressure due to the surcharging effects of adjacent structures, soil, or traffic loads should be considered, where appropriate, during design of the shoring system.

10.2.5 Passive Resistance – Passive soil pressure resistance for embedded portions of soldier piles can be based upon an equivalent passive soil fluid weight of 350D, where D is the depth of embedment (resulting in pounds per square foot), as shown on **Figure 31**. The passive resistance can be assumed to act over a width of three pile diameters. The project structural engineer and or shoring designer should determine the actual embedment depth.

10.2.6 Drilled Shafts – Drilled shafts for the soldier piles should be observed by Geocon Incorporated prior to the placement of steel reinforcement to check that the exposed soil conditions are similar to those expected and that footing excavations have been extended to the appropriate bearing strata, and design depths. If unexpected soil conditions are encountered, foundation modifications may be required. Sloughing of the excavation and drilling difficulty should be expected.

10.2.7 Monitoring of Shoring System – Lateral movement of shoring is associated with vertical ground settlement outside of the excavation. Therefore, it is essential that the soldier pile and tieback system allow very limited amounts of lateral displacement. Earth pressures acting on a lagging wall can cause movement of the shoring toward the excavation and result in ground subsidence outside of the excavation. Consequently, horizontal movements of the shoring wall should be accurately monitored and recorded during excavation and anchor construction.

Survey points should be established at the top of the pile on at least 20 percent of the soldier piles. An additional point located at an intermediate point between the top of the pile and the base of the excavation should be monitored on at least 20 percent of the piles if tieback anchors will be used. These points should be monitored on a weekly basis during excavation work and on a monthly basis thereafter until the permanent support system is constructed.

10.2.8 Shoring Type Selection – The project civil engineer should provide the location, depth, and pipe type of the underground utilities adjacent to the site to the shoring engineer to help select the appropriate shoring type and design. The shoring system should be designed to limit horizontal and vertical soldier pile movement to a maximum of 1-inch and ½-inch, respectively. The amount of horizontal deflection can be assumed to be essentially zero along the Active Zone and Effective Zone boundary (see **Figure 32**). The magnitude of movement for intermediate depths and distances from the shoring wall can be linearly interpolated.

10.2.9 Tiebacks – Tieback anchors, if employed in shoring should be designed such that anchors fully penetrate the Active Zone behind the shoring. The Active Zone can be considered the wedge of soil from the face of the shoring to a plane extending upward from the base of the

excavation at a 29-degree angle from vertical, as shown on **Figure 32**. Normally, tieback anchors are contractor-designed and installed, and there are numerous anchor construction methods available. Non-shrinkage grout should be used for the construction of the tieback anchors.

Experience has shown that the use of pressure grouting during formation of the bonded portion of the anchor will increase the soil-grout bond stress. A pressure grouting tube should be installed during the construction of the tieback. Post grouting should be performed if adequate capacity cannot be obtained by other construction methods.

Anchor capacity is a function of construction method, depth of anchor, batter, diameter of the bonded section, and the length of the bonded section. Anchor capacity should be evaluated using the strength parameters shown in Table 10.2.

TABLE 10.2
SOIL STRENGTH PARAMETERS FOR TEMPORARY ANCHOR DESIGN

Description	Cohesion (psf)	Friction Angle (Degrees)
Old Paralic Deposits	100	33

Grout should only be placed in the tieback anchor's bonded section prior to testing. Tieback anchors should be proof-tested to at least 130 percent of the anchor's design working load. Following a successful proof test, the tieback anchors should be locked off at 80 percent of the allowable working load. Tieback anchor test failure criteria should be established in project plans and specifications. The tieback anchor test failure criteria should be based upon a maximum allowable displacement at 130 percent of the anchor's working load (anchor creep) and a maximum residual displacement within the anchor following stressing. Tieback anchor stressing should only be conducted after sufficient hydration has occurred within the grout. Tieback anchors that fail to meet project specified test criteria should be replaced or additional anchors should be constructed.

10.2.10 Use of Shoring As Permanent Improvement – The recommendations contained herein including the lateral earth pressures assume a temporary wall condition. Geocon Incorporated should be consulted to provide additional recommendations if the shoring wall will be a permanent structure.

10.2.11 Lagging Placement – Lagging should keep pace with excavation and tieback anchor construction. The excavation should not be advanced deeper than three feet below the bottom of lagging at any time. These unlagged gaps of up to three feet should only be

allowed to stand for short periods of time in order to decrease the probability of soil instability and should never be unsupported overnight. Backfilling and/or grouting should be conducted when necessary between the back of lagging and excavation sidewalls to reduce sloughing in this zone and all voids should be filled by the end of each day. The use of slurry or grout as backfill behind the lagging is recommended to avoid settlement behind the shoring system. Further, the excavation should not be advanced further than four feet below a row of tiebacks prior to those tiebacks being proof tested and locked off.

10.2.12 Preconstruction Survey of Conditions and Monitoring – If tieback anchors are employed, an accurate survey of existing utilities and other underground structures adjacent to the shoring wall should be conducted. The survey should include both locations and depths of existing utilities. Locations of anchors should be adjusted as necessary during the design and construction process to accommodate the existing and proposed utilities.

The condition of any existing buildings, streets, sidewalks, and other structures/improvements around the perimeter of the planned excavation should be documented prior to the start of shoring and excavation work. Special attention should be given to documenting existing cracks or other indications of differential settlement within these adjacent structures, pavements and other improvements. Underground utilities sensitive to settlement should be videotaped prior to construction to check the integrity of pipes. In addition, monitoring points should be established indicating location and elevation around the excavation and on existing buildings. These points should be monitored on a weekly basis during excavation work and on a monthly basis thereafter. Inclinometers should be installed and monitored behind any shoring sections that will be excavated deeper than 30 feet below the existing ground surface.

10.2.13 Removal of Anchors – Tieback anchors within the City right-of-way, if any, should be removed in conformance with City of Del Mar requirements. Geocon Incorporated should observe and document the removal of the anchors.

10.3 Corrosion

Geocon Incorporated does not practice in the field of corrosion engineering; therefore, if improvements that could be susceptible to corrosion are planned, it is recommended that further evaluation by a corrosion engineer be performed.

10.4 Bluff Setback

10.4.1 By combining the setback needed to achieve a factor of safety of 1.5 to the setback needed to accommodate 75 years of bluff retreat, the recommended total setback from the top of the bluff ranges from **43 to 95** feet which applies to primary structures (see **Figures 3 and 26**).

10.4.2 The proposed development also includes public access trails, pools, hardscape, landscaping, benches, and other types of soft adaptive development. In order for the new trails to connect with the existing trails and coastal access paths currently located in the North Bluff Preserve area, these will be located seaward of the blufftop setback range calculated for medium-high risk aversion development types (F.S.1.5 + 33 feet).

10.4.3 The adaptive capacity of the soft development components of the project are fairly high, and if necessary, can be easily removed and/or moved back. Following the recommendations set forth in both the OPC and CCC sea level rise guidance documents, these are fairly risk tolerant and low consequence types of development can be located in front of the medium-high blufftop setback. The project has adequate space for the trails to be moved back if necessary, ensuring that no public access will be lost in light of sea level rise.

10.4.4 **Figure 3 and 26**, presents the recommended blufftop setback delineations considering the Simple Equation model with medium-high risk aversion scenarios to account for sea level rise. **Figure 26** also shows and the 1.5 multiplier method originally calculated but is not used. **Figure 27** presents the 0.5 percent probability of exceedance sea level rise under a high emission scenario (medium-high risk aversion, F.S.1.5 + 33 feet) plotted on a resort rendering.

10.5 Seismic Design Criteria

10.5.1 Seismic Design Parameters – We used the Structural Engineers Association of California (SEAOC) and Office of Statewide Health Planning and Development (OSHPD) web application *Seismic Design Maps* (https://seismicmaps.org). Table 10.5.1 summarizes site-specific design criteria obtained from the 2016 California Building Code (CBC; Based on the 2015 International Building Code [IBC] and ASCE 7-10), Chapter 16 Structural Design, Section 1613 Earthquake Loads. The short spectral response uses a period of 0.2 second. The building structure and improvements should be designed using a Site Class D. We evaluated the site class based on the discussion in Section 1613.3.2 of the 2016 CBC and Table 20.3-1 of ASCE 7-10. The values presented in Table 10.5.1 are for the risk-targeted maximum considered earthquake (MCE_R).

TABLE 10.5.1
2016 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2016 CBC Reference
Site Class	D	Section 1613.3.2
MCE_R Ground Motion Spectral Response Acceleration – Class B (short), S_S	1.209g	Figure 1613.3.1(1)
MCE_R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.469g	Figure 1613.3.1(2)
Site Coefficient, F_A	1.017	Table 1613.3.3(1)
Site Coefficient, F_V	1.531	Table 1613.3.3(2)
Site Class Modified MCE_R Spectral Response Acceleration (short), S_{MS}	1.229g	Section 1613.3.3 (Eqn 16-37)
Site Class Modified MCE_R Spectral Response Acceleration (1 sec), S_{M1}	0.718g	Section 1613.3.3 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (short), S_{DS}	0.819g	Section 1613.3.4 (Eqn 16-39)
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.478g	Section 1613.3.4 (Eqn 16-40)

Table 10.5.2 presents additional seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-10 for the mapped maximum considered geometric mean (MCE_G).

TABLE 10.5.2
2016 CBC SITE ACCELERATION PARAMETERS

Parameter	Value, Site Class D	ASCE 7-10 Reference
Mapped MCE_G Peak Ground Acceleration, PGA	0.517g	Figure 22-7
Site Coefficient, F_{PGA}	1.000	Table 11.8-1
Site Class Modified MCE_G Peak Ground Acceleration, PGA_M	0.517g	Section 11.8.3 (Eqn 11.8-1)

10.5.2 Conformance to the criteria for seismic design does not constitute any guarantee or assurance that significant structural damage or ground failure will not occur in the event of a maximum level earthquake. The primary goal of seismic design is to protect life and not to avoid all damage, since such design may be economically prohibitive.

10.6 Preliminary Foundation Recommendations

10.6.1 Bearing Soils and Foundation Type – Based on preliminary plans, we expect all of the building footings will bear entirely on compacted fill or the underlying Old Paralic Deposits.

The proposed structures can be supported on a shallow foundation system founded entirely in the Old Paralic Deposits or compacted fill. Foundations for the structures should consist of continuous strip footings and/or isolated spread footings. A footing dimension detail, depicting the depth to lowest adjacent grade, is presented in **Figure 33**.

Specific foundation design recommendations, such as footing dimensions and reinforcement, will be provided as building concepts and locations are finalized in future plans. We expect a minimum of 12- to 15-inch-wide footings extending approximately 12 to 24 inches below lowest adjacent soil grade, depending on building locations and heights. Since multiple-story structures are being contemplated, footing dimension might be much greater due to structural considerations.

10.6.2 Bearing Capacity – The recommended allowable bearing capacity for foundations with minimum dimensions of 12-inches wide and 12-inches deep and bearing on compacted fill or Old Paralic Deposits is 2,500 pounds per square foot (psf). The allowable soil bearing pressure may be increased by an additional 500 psf for each additional foot of depth and 300 psf for each additional foot of width, to a maximum allowable bearing capacity of 4,000 psf. The values presented above are for dead plus live loads and may be increased by one-third when considering transient loads due to wind or seismic forces.

10.6.3 Settlement – Settlement due to footing loads conforming to the above recommended allowable soil bearing pressures is expected to be less than 1-inch total and ½-inch differential over a span of 40 feet.

10.6.4 Foundations Adjacent to Slopes – Where buildings or other improvements are planned near the top of a slope steeper than 3:1 (horizontal to vertical), special foundations and/or design considerations are recommended due to the tendency for lateral soil movement to occur. Building and retaining wall footings should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope.

10.6.5 Observation of Foundation Excavations – Foundation excavations should be observed by the geotechnical engineer (a representative of Geocon Incorporated) prior to the placement of reinforcing steel and concrete to verify that the exposed soil conditions are consistent

with those anticipated and have been extended to appropriate bearing strata. If unanticipated soil conditions are encountered, foundation modifications may be required.

10.7 Concrete Slabs-on-Grade

10.7.1 Slab on Grade Design – The concrete slab-on-grade for the structures should be at least 5 inches thick. As a minimum, reinforcement for slabs-on-grade should consist of No. 3 steel reinforcing bars placed at 18 inches on center in both directions.

A modulus of subgrade reaction of 125 pounds per cubic inch (pci) and 200 pci is recommended for compacted fill and Old Paralic Deposits, respectively. These values are for a foundation measuring 1-foot by 1-foot and should be modified for design using standard equations.

The concrete slab-on-grade recommendations are based on soil support characteristics only. The project structural engineer should evaluate the structural requirements of the concrete slabs for supporting equipment and storage loads.

10.7.2 Vapor Barrier – A vapor retarder should underlie slabs that may receive moisture-sensitive floor coverings or may be used to store moisture-sensitive materials. The vapor-retarder design should be consistent with the guidelines presented in the American Concrete Institute's (ACI) *Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials* (ACI 302.2R-06). The project architect or developer should specify the type of vapor retarder used based on the type of floor covering that will be installed and if the structure will possess a humidity-controlled environment.

The vapor barrier should be underlain by bedding sand or crushed aggregate. The bedding sand or crushed aggregate thickness should be determined by the project foundation engineer, architect, and/or developer. It is common to use 3 to 4 inches of sand or crushed aggregate.

10.7.3 Concrete – The foundation design engineer should provide appropriate concrete mix design criteria and curing measures to assure proper curing of the slab by reducing the potential for rapid moisture loss and subsequent cracking and/or slab curl. It is critical that the foundation contractor understands and follows the recommendations presented on the foundation plans.

The recommendations presented herein are intended to reduce the potential for cracking of slabs and foundations as a result of differential movement. However, even with the incorporation of the recommendations presented herein, foundations and slabs-on-grade will

still exhibit some cracking. The occurrence of concrete shrinkage cracks is independent of the soil supporting characteristics. Their occurrence may be reduced and/or controlled by limiting the slump of the concrete, the use of crack-control joints and proper concrete placement and curing. Literature provided by the Portland Concrete Association (PCA) and American Concrete Institute (ACI) present recommendations for proper concrete mix, construction and curing practices, and should be incorporated into project construction.

10.7.4 Exterior Concrete Flatwork – Exterior concrete flatwork not subject to vehicular traffic should be constructed in accordance with the recommendations herein. Slab panels should be a minimum of 4 inches thick and, when in excess of 8 feet square, should be reinforced at med height with 6 x 6 - W2.9/W2.9 (6 x 6 - 6/6) welded wire mesh or No. 3 reinforcing bars at 18 inches on center in both directions to reduce the potential for cracking. In addition, concrete flatwork should be provided with crack control joints to reduce and/or control shrinkage cracking. Crack control spacing should be determined by the project structural engineer based upon the slab thickness and intended usage. Criteria of the American Concrete Institute (ACI) should be taken into consideration when establishing crack control spacing. Subgrade soil for exterior slabs not subjected to vehicle loads should be compacted in accordance with criteria presented in the grading section prior to concrete placement. Exposed subgrade soil should be kept in a moist condition prior to placing concrete.

10.8 Retaining Walls and Lateral Loads Recommendations

10.8.1 Active Pressure Design – Retaining walls not restrained at the top and having a level backfill surface should be designed for an active soil pressure equivalent to the pressure exerted by a fluid with a density of 35 pounds per cubic foot (pcf). Where the backfill will be inclined at 2:1 (horizontal:vertical), an active soil pressure of 50 pcf is recommended. These soil pressures assume that the backfill materials within an area bounded by the wall and a 1:1 plane extending upward from the base of the wall possess an Expansion Index $\leq$50. Geocon Incorporated should be consulted for additional recommendations if backfill materials have an EI >50.

Retaining walls should be designed to ensure stability against overturning, sliding, excessive foundation pressure and water uplift. Where a keyway is extended below the wall base with the intent to engage passive pressure and enhance sliding stability, it is not necessary to consider active pressure on the keyway.

10.8.2 At Rest Design – Where walls are restrained from movement at the top, an additional uniform pressure of 8H psf (where H equals the height of the retaining wall portion of the wall in feet) should be added to the active soil pressure where the wall possesses a height of 8 feet or less and 12H where the wall is greater than 8 feet. For retaining walls subject to

vehicular loads within a horizontal distance equal to two-thirds the wall height, a surcharge equivalent to two feet of fill soil should be added (total unit weight of soil should be taken as 130 pcf).

10.8.3 Retaining Wall Backfill – Soil contemplated for use as retaining wall backfill, including import materials, should be identified in the field prior to backfill. At that time Geocon Incorporated should obtain samples for laboratory testing to evaluate its suitability. Modified lateral earth pressures may be necessary if the backfill soil does not meet the required expansion index or shear strength. City or regional standard wall designs, if used, are based on a specific active lateral earth pressure and/or soil friction angle. In this regard, on-site soil to be used as backfill may or may not meet the values for standard wall designs. Geocon Incorporated should be consulted to assess the suitability of the on-site soil for use as wall backfill if standard wall designs will be used.

10.8.4 Lateral Movement – Unrestrained walls will move laterally when backfilled and loading is applied. The amount of lateral deflection is dependent on the wall height, the type of soil used for backfill, and loads acting on the wall. The wall designer should provide appropriate lateral deflection quantities for planned retaining walls structures, if applicable. These lateral values should be considered when planning types of improvements above retaining wall structures.

10.8.5 Wall Drainage – Retaining walls should be provided with a drainage system adequate to prevent the buildup of hydrostatic forces and should be waterproofed as required by the project architect. The use of drainage openings through the base of the wall (weep holes) is not recommended where the seepage could be a nuisance or otherwise adversely affect the property adjacent to the base of the wall. The above recommendations assume a properly compacted granular (EI $\leq$50) free-draining backfill material with no hydrostatic forces or imposed surcharge load. A typical retaining wall drainage detail is presented on **Figure 34**. A typical soldier pile wall drainage detail is presented as **Figure 35**. A typical soil nail wall drainage detail is shown as **Figure 36**. If conditions different than those described are expected, or if specific drainage details are desired, Geocon Incorporated should be contacted for additional recommendations.

10.8.6 Bearing Capacity – In general, wall foundations supported by compacted fill or Old Paralic Deposits having a minimum depth and width of one foot may be designed for an allowable soil bearing pressure of 2,500, provided the soil within three feet below the base of the wall has an Expansion Index $\leq$ 90. The recommended allowable soil bearing pressure may be increased by 300 psf and 500 psf for each additional foot of foundation width and depth,

respectively, up to a maximum allowable soil bearing pressure of 4,000 psf for foundations bearing on compacted fill or Old Paralic Deposits.

The proximity of the foundation to the top of a slope steeper than 3:1 could impact the allowable soil bearing pressure. Therefore, Geocon Incorporated should be consulted where such a condition is anticipated. As a minimum, wall footings should be deepened such that the bottom outside edge of the footing is at least seven feet from the face of slope when located adjacent and/or at the top of descending slopes.

10.8.7 Seismic Design of Walls – The structural engineer should determine the Seismic Design Category for the project in accordance with Section 1613.3.5 of the 2016 CBC or Section 11.6 of ASCE 7-10. For structures assigned to Seismic Design Category of D, E, or F, retaining walls that support more than 6 feet of backfill should be designed with seismic lateral pressure in accordance with Section 1803.5.12 of the 2016 CBC. The seismic load is dependent on the retained height where H is the height of the wall, in feet, and the calculated loads result in pounds per square foot (psf) exerted at the base of the wall and zero at the top of the wall. A seismic load of 21H should be used for design. We used the peak ground acceleration adjusted for Site Class effects, PGA_M, of 0.517g calculated from ASCE 7-10 Section 11.8.3 and applied a pseudo-static coefficient of 0.33.

10.8.8 Lateral Resistance – To resist lateral loads, a passive pressure exerted by an equivalent fluid weight of 350 pounds per cubic foot (pcf) should be used for design of footings or shear keys poured neat against native Old Paralic Deposits. The lateral passive pressures may be increased by one-third when considering transient loads due to wind or seismic forces. The allowable passive pressure assumes a horizontal surface extending at least 5 feet or three times the height of the surface generating the passive pressure, whichever is greater. The upper 12 inches of material not protected by floor slabs or pavement should not be included in the design for lateral resistance. Where walls are planned adjacent to and/or on descending slopes, a passive pressure of 150 pcf should be used in design.

An ultimate friction coefficient of 0.35 may be used for resistance to sliding between soil and concrete. This friction coefficient may be combined with the passive earth pressure

10.8.9 Wall Height – The recommendations presented above are generally applicable to the design of rigid concrete or masonry retaining walls having a maximum height of 12 feet. In the event that walls higher than 12 feet are planned, Geocon Incorporated should be consulted for additional recommendations.

10.8.10 Observation of Wall Footing Excavations – Foundation excavations should be observed by the geotechnical engineer (a representative of Geocon Incorporated) prior to the placement of reinforcing steel and concrete to observe that the exposed soil conditions are consistent with those anticipated and that they have been extended to the appropriate bearing strata. If unanticipated soil conditions are encountered, foundation modifications may be required.

10.9 Low Impact Development

10.9.1 It is anticipated that low-impact-development (LID) systems will be planned for storm water management. LID best management practices (BMPs) are intended to increase storm water quality prior to entering the storm drain system and reduce peak flow rates.

10.9.2 In general, saturation of the compacted fill or Old Paralic Deposits must be avoided to reduce the potential negative impacts to slope stability and improvements and adjacent properties from water infiltration and lateral water migration. Downgradient properties may be subjected to seeps, springs, slope instability, raised groundwater, movement of foundations and slabs, or other impacts as a result of water infiltration. Saturating compacted fills can result in hydro-compression and settlement potentially impacting surface improvements. LID systems located adjacent to parking and roadway pavements often enable water to migrate beneath pavements saturating the subgrade soils and aggregate base, which can lead to pavement distress. In addition, water may enter underground utility pipe zones and impact improvements down gradient from the site.

10.9.3 Due to the potential for hydro-consolidation/differential settlement and coastal bluff instability if water was allowed to infiltrate into the Old Paralic Deposits, liners and subdrains will be required for any basins and bioretention areas.

10.10 Site Drainage and Moisture Protection

10.10.1 Site Drainage – Adequate site drainage is critical to reduce the potential for slope instability, differential soil movement, erosion, and subsurface seepage. Under no circumstances should water be allowed to pond adjacent to footings. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2016 CBC 1804.4 or other applicable standards. In addition, within grading areas, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices. Roof and pavement drainage should be directed into conduits that carry runoff away from proposed structure.

10.10.2 Utilities – Underground utilities should be leak free. Utility and irrigation lines should be checked periodically for leaks, and detected leaks should be repaired promptly. Detrimental

soil movement could occur if water is allowed to infiltrate the soil for prolonged periods of time.

10.11 Plan Review

10.11.1 Geocon Incorporated should review the grading plans and foundation plans for the project prior to final design submittal to evaluate whether additional analyses and/or recommendations are required.

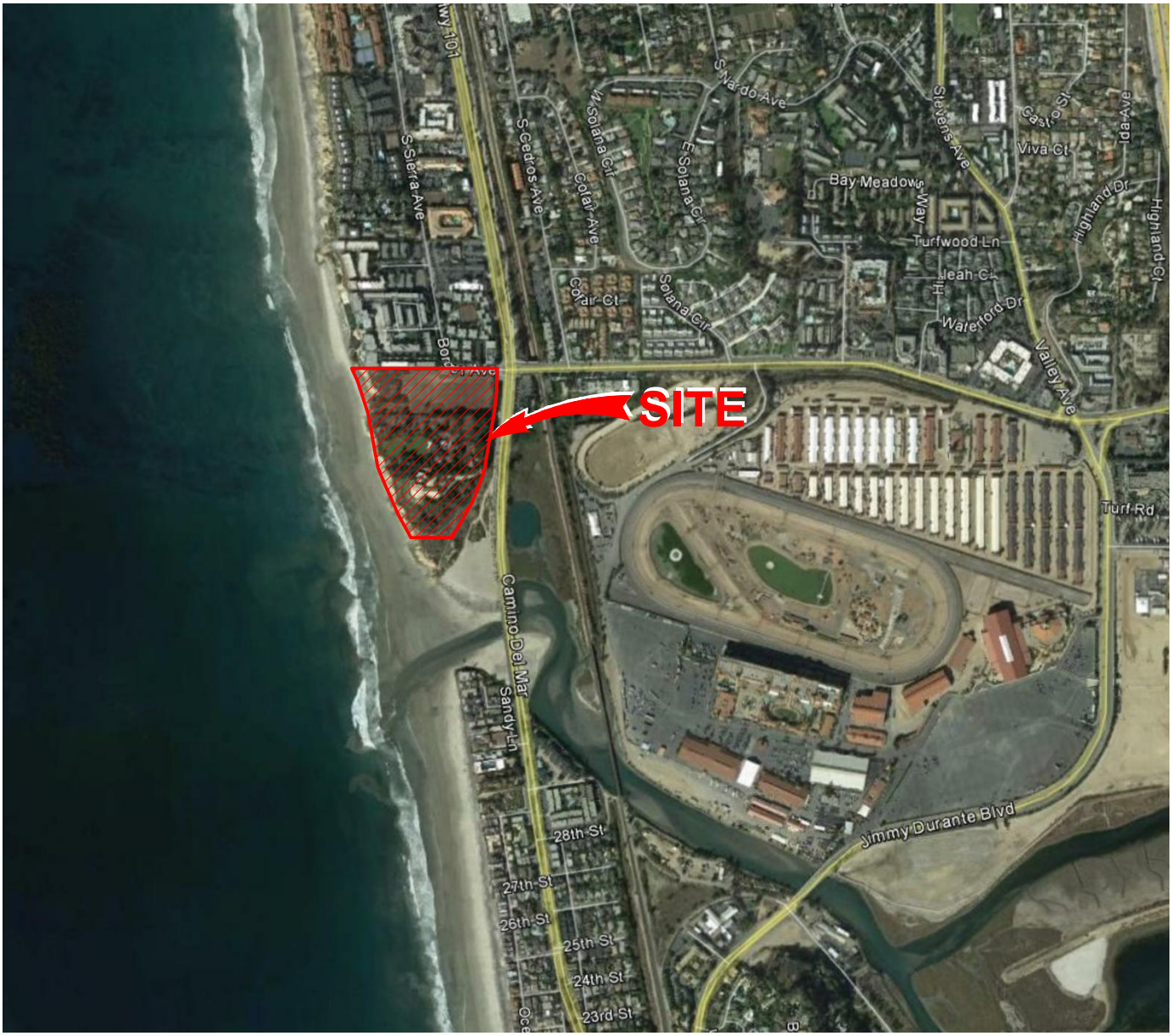
LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

2. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.

3. This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.



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NO SCALE

VICINITY MAP

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MARISOL
DEL MAR, CALIFORNIA

DE / RA		DSK/GTYPD

DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. 1

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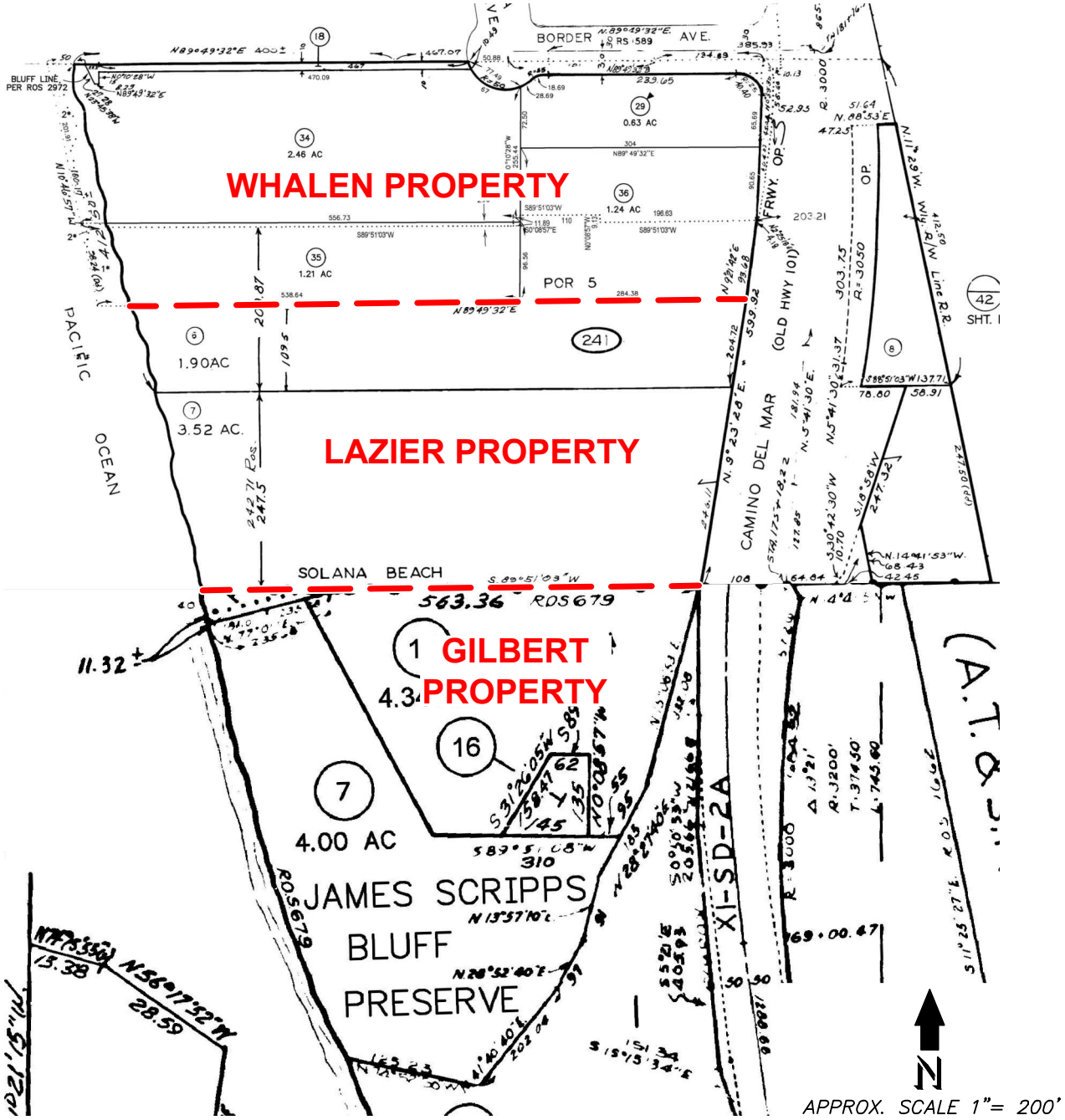

PARCEL MAP

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DEL MAR, CALIFORNIA

DE / RA		DSK/GTYPD

DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. 2

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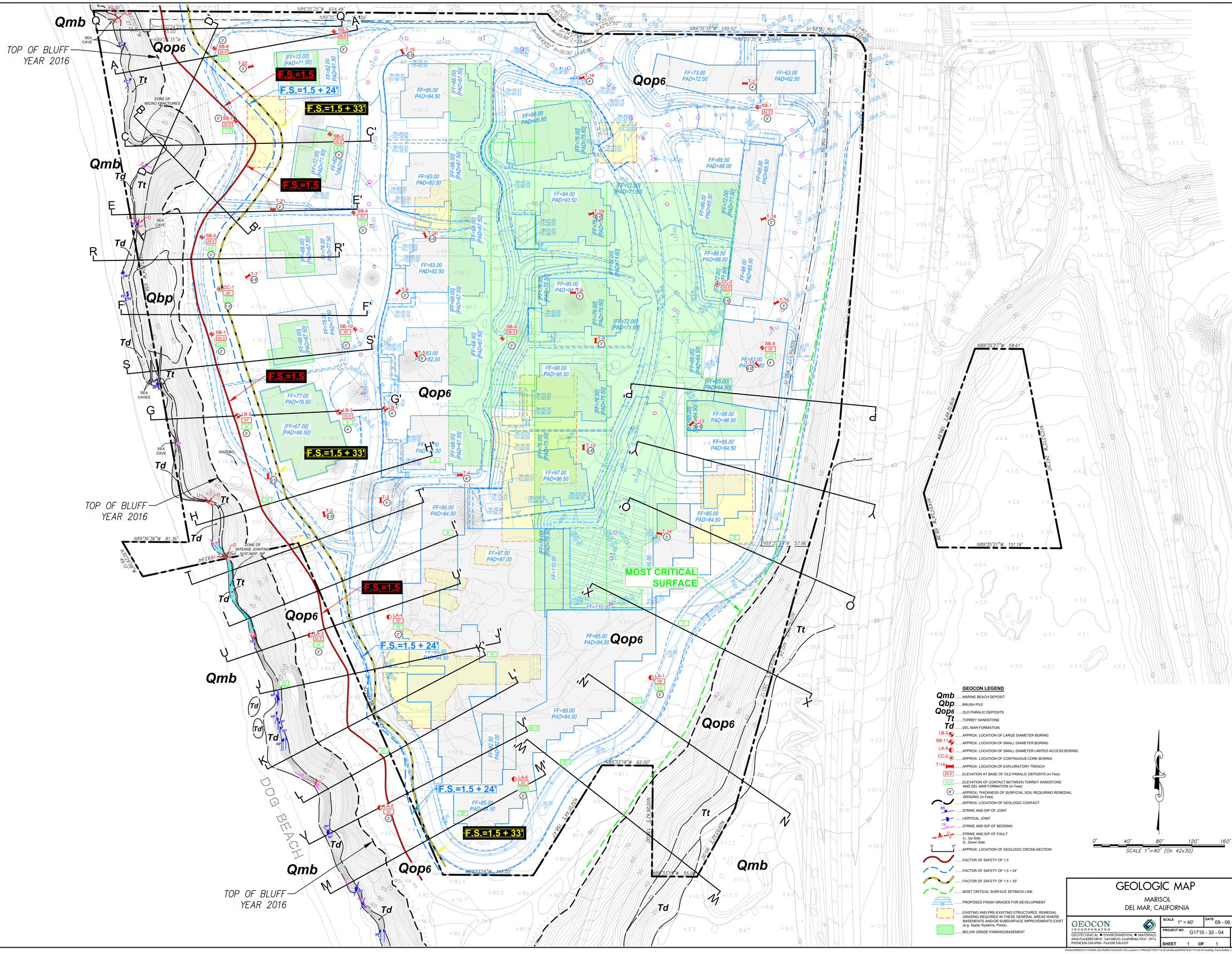
Qmb
Qop6
Qbp
Qop6
Tt
Td
TOP OF BLUFF
YEAR 2016
SEA CAVE
ZONE OF MICRO FRACTURES
ZONE OF INTENSE JOINTING N15°-N25°, 90°
GAZEBO
F.S.=1.5
F.S.=1.5 + 24'
F.S.=1.5 + 33'
MOST CRITICAL SURFACE
DOG BEACH
N89°35'35"W 604.48'
N89°35'35"W 239.50'
N89°35'35"W 309.69'
N89°35'27"W 58.61'
N89°35'27"W 151.19'
N89°36'36"W 81.36'
N89°33'15"W 447.00'
N89°33'18"W 62.00'
N89°35'27"W 57.96'
N10°02'42"E 150.00'
N10°02'42"E 239.50'
N10°02'42"E 198.36'
N10°02'42"E 68.36'
N10°01'41"E 158.17'
N10°01'41"E 129.01'
N10°01'41"E 29.16'
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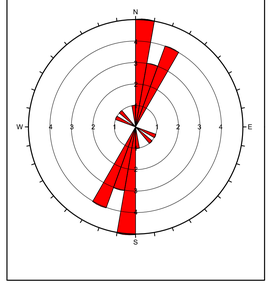
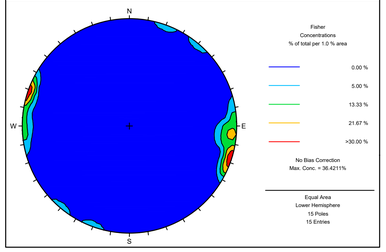
N10°01'41"E 29.50'
N10°01'41"E 29.50

ROSE DIAGRAM OF PRIMARY JOINT SET



STEREONET PLOT OF POLES OF PRIMARY JOINT SET



GEOCON LEGEND

- **Qmb** ..... MARINE BEACH DEPOSIT
- **Qbp** ..... BRUSH PILE
- **Qop6** ..... OLD PARALIC DEPOSITS
- **Tt** ..... TORREY SANDSTONE
- **Td** ..... DEL MAR FORMATION
- LB-3 ..... APPROX. LOCATION OF LARGE DIAMETER BORING
- SB-11 ..... APPROX. LOCATION OF SMALL DIAMETER BORING
- LA-5 ..... APPROX. LOCATION OF SMALL DIAMETER LIMITED ACCESS BORING
- CC-2 ..... APPROX. LOCATION OF CONTINUOUS CORE BORING
- T-14 ..... APPROX. LOCATION OF EXPLORATORY TRENCH
- 26.5' ..... MEAN SEA LEVEL ELEVATION AT BASE OF OLD PARALIC DEPOSITS (In Feet)
- 13.5' ..... MEAN SEA LEVEL ELEVATION OF CONTACT BETWEEN TORREY SANDSTONE AND DEL MAR FORMATION (In Feet)
- (6') ..... APPROX. THICKNESS OF SURFICIAL SOIL REQUIRING REMEDIAL GRADING (In Feet)
- ..... APPROX. LOCATION OF GEOLOGIC CONTACT
- 85/ ..... STRIKE AND DIP OF JOINT
- ..... VERTICAL JOINT
- 10/ ..... STRIKE AND DIP OF BEDDING
- ..... STRIKE AND DIP OF FAULT
  U...Up Side
  D...Down Side
- ..... ELEVATION CONTOUR OF BASE OF OLD PARALIC DEPOSITS (In Feet)
- ..... ELEVATION CONTOUR OF CONTACT BETWEEN TORREY SANDSTONE AND DEL MAR FORMATION (In Feet)
- ..... GENERAL STRIKE AND DIP OF TORREY SANDSTONE/ DEL MAR FORMATION CONTACT
- ..... GENERAL TREND OF OLD PARALIC DEPOSIT DEPOSITIONAL PLATFORM

0' 40' 80' 120' 160'

SCALE 1"=40' (On 42x30)

GEOLOGIC STRUCTURE MAP

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SCALE	1" = 40'
DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04
FIGURE	4
SHEET	1 OF 1

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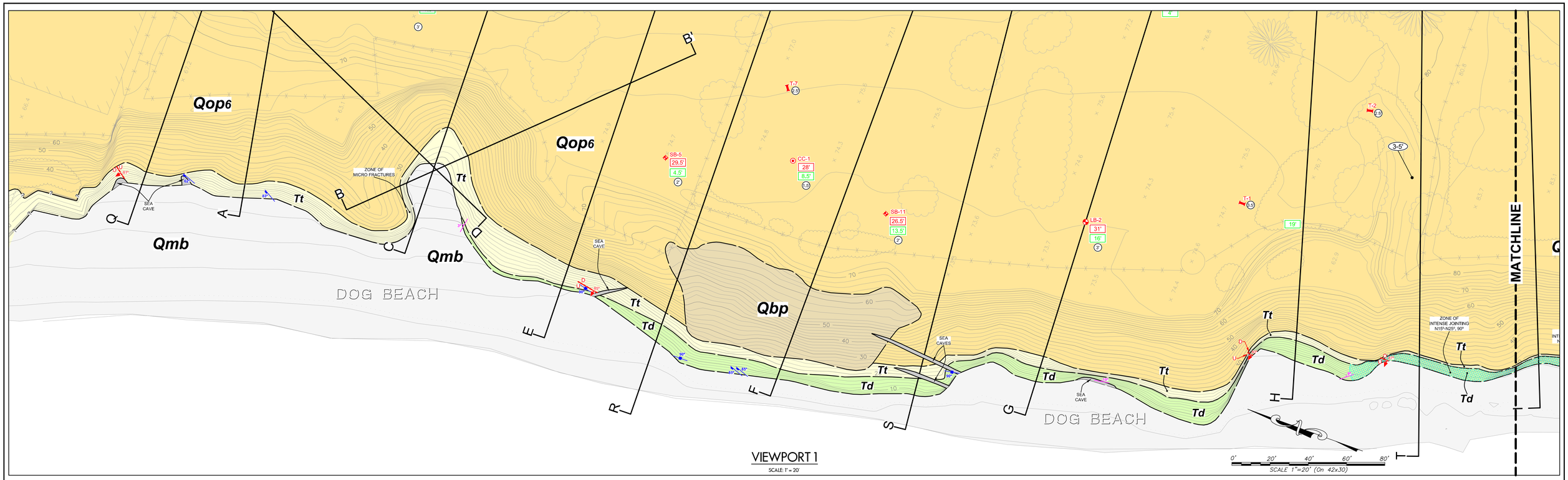
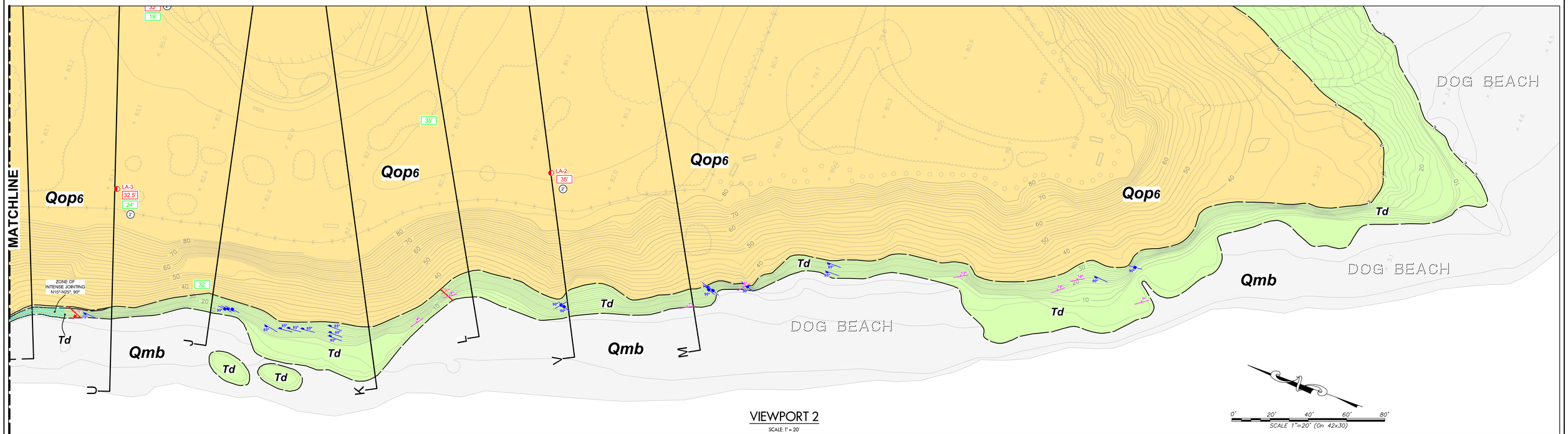
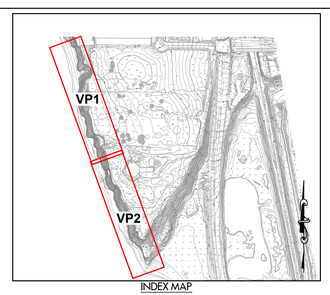
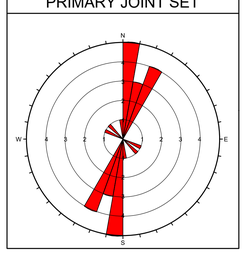


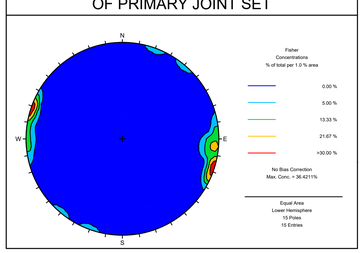




ROSE DIAGRAM OF PRIMARY JOINT SET



STEREONET PLOT OF POLES OF PRIMARY JOINT SET



GEOCON LEGEND

- Qmb ..... MARINE BEACH DEPOSIT
- Qbp ..... BRUSH PILE
- Qop6 ..... OLD PARALIC DEPOSITS
- Tt ..... TORREY SANDSTONE
- Td ..... DEL MAR FORMATION
- LB-3 ..... APPROX. LOCATION OF LARGE DIAMETER BORING
- SB-11 ..... APPROX. LOCATION OF SMALL DIAMETER BORING
- LA-5 ..... APPROX. LOCATION OF SMALL DIAMETER LIMITED ACCESS BORING
- CC-2 ..... APPROX. LOCATION OF CONTINUOUS CORE BORING
- T-14 ..... APPROX. LOCATION OF EXPLORATORY TRENCH
- 26.5' ..... ELEVATION AT BASE OF OLD PARALIC DEPOSITS (In Feet)
- 13.5' ..... ELEVATION OF CONTACT BETWEEN TORREY SANDSTONE AND DEL MAR FORMATION (In Feet)
- 6' ..... APPROX. THICKNESS OF SURFICIAL SOIL REQUIRING REMEDIAL GRADING (In Feet)
- ..... APPROX. LOCATION OF GEOLOGIC CONTACT
- 85 ..... STRIKE AND DIP OF JOINT
- ..... VERTICAL JOINT
- 15 ..... STRIKE AND DIP OF BEDDING
- ..... STRIKE AND DIP OF FAULT (U..Up Side, D..Down Side)
- ..... APPROX. LOCATION OF GEOLOGIC CROSS-SECTION

BLUFF FACE MAP

MARISOL
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SCALE	1" = 20'	DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04	FIGURE	5
SHEET	1 OF 1		

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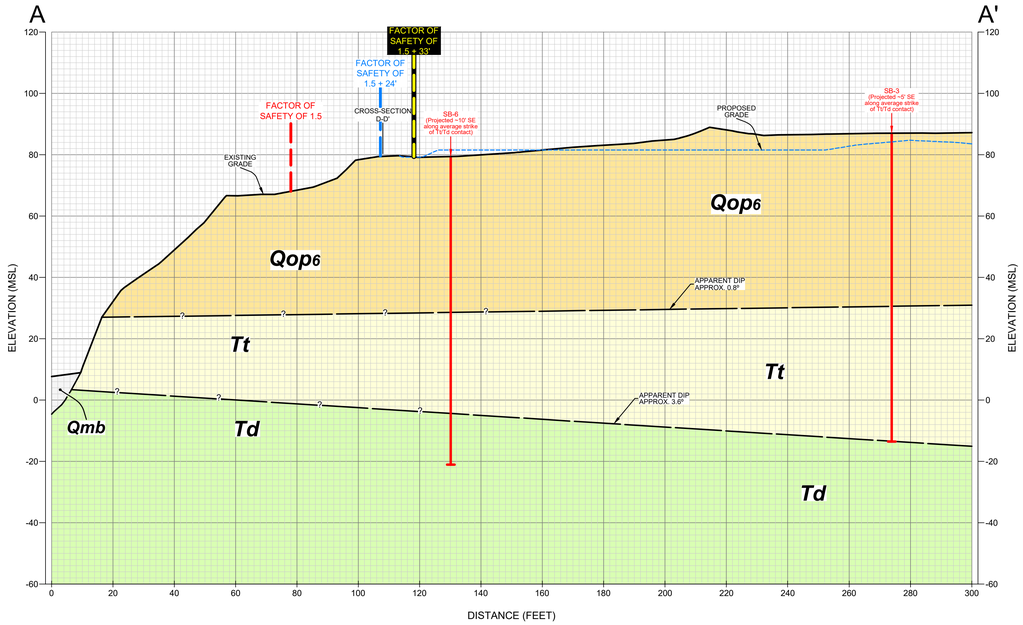
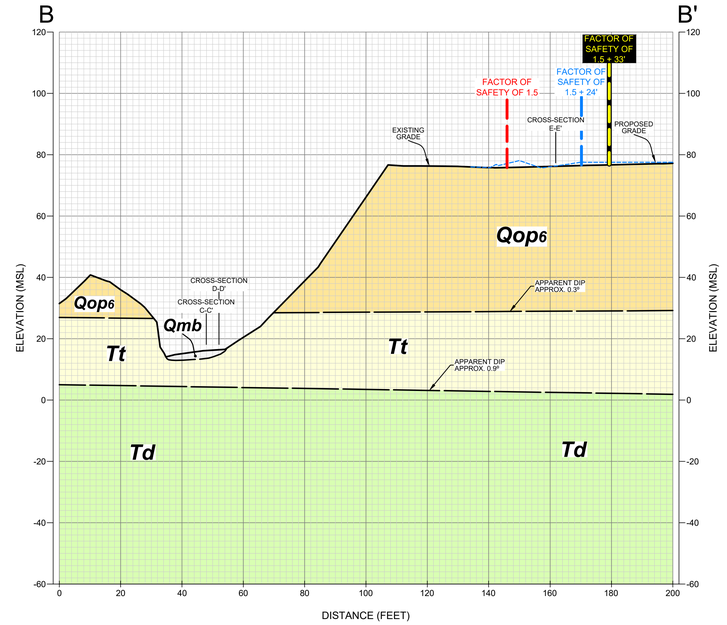


GEOLOGIC CROSS-SECTION A-A'

SCALE: 1" = 20' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION B-B'

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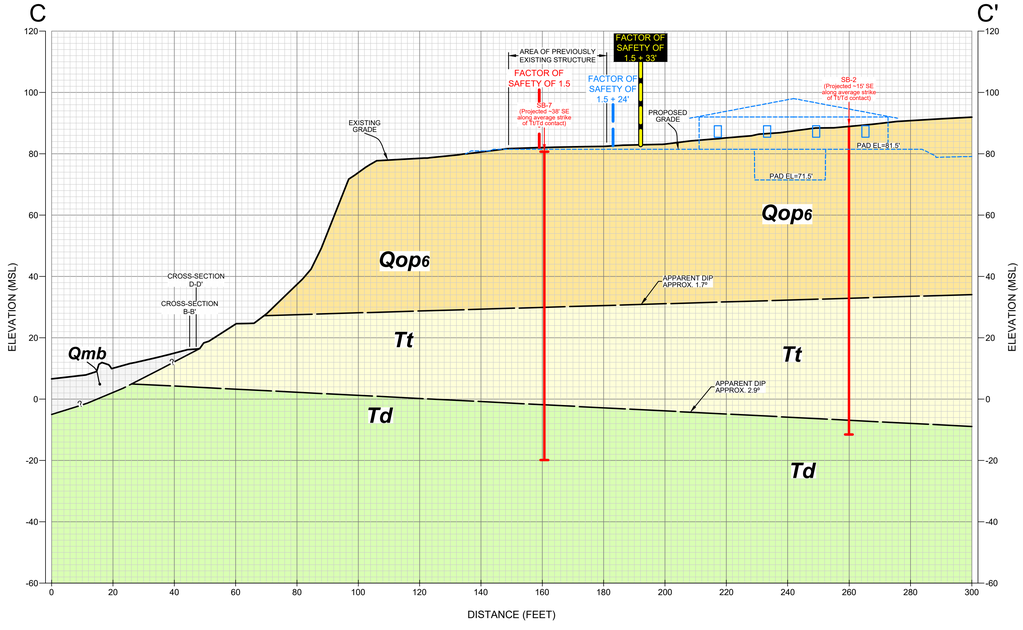

GEOLOGIC CROSS-SECTION C-C'

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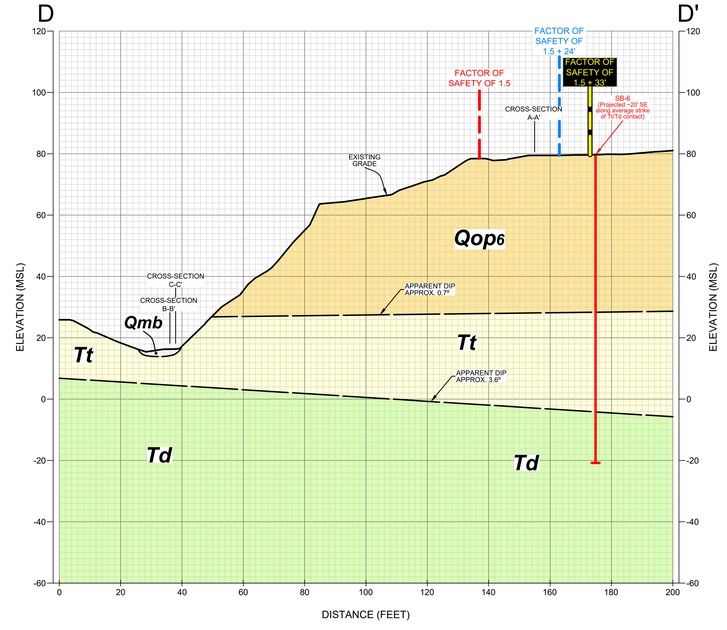

GEOLOGIC CROSS-SECTION D-D'

SCALE: 1" = 20' (Vert. = Horiz.)

GEOCON LEGEND

- Qbp ..... BRUSH PILE
- Qmb ..... MARINE BEACH DEPOSIT
- Qop6 ..... OLD PARALIC DEPOSITS
- Tt ..... TORREY SANDSTONE
- Td ..... DEL MAR FORMATION
- SB-6 ..... APPROX. LOCATION OF EXPLORATORY BORING
  - CC....Continuous Core Boring
  - SB....Small-Diameter Boring
  - LB....Large-Diameter Boring
  - LA....Limited Access Boring
- ..... APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOLOGIC CROSS - SECTIONS A, B, C, D

MARISOL

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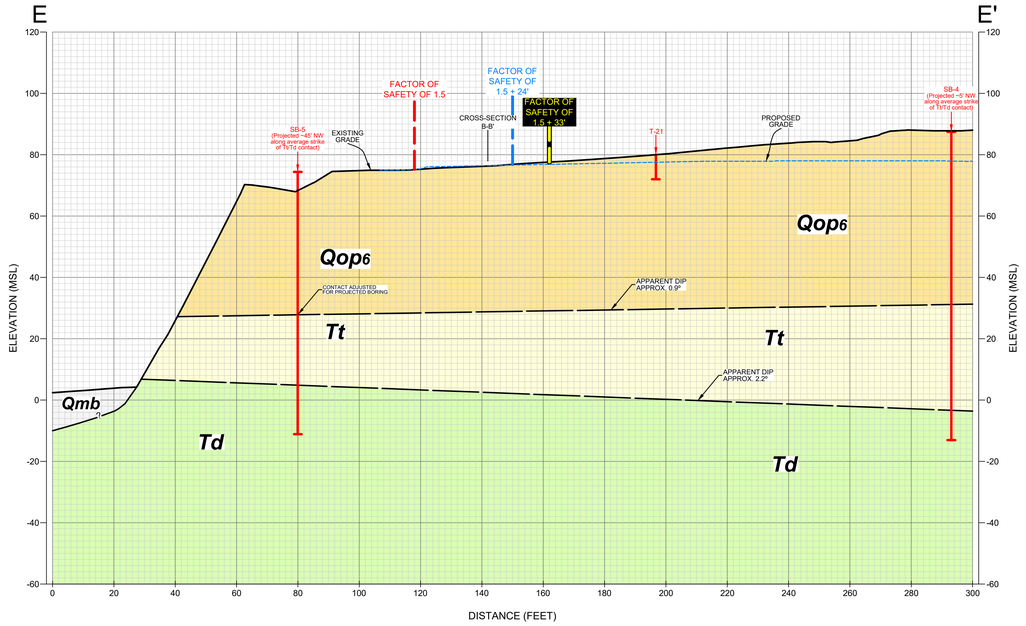
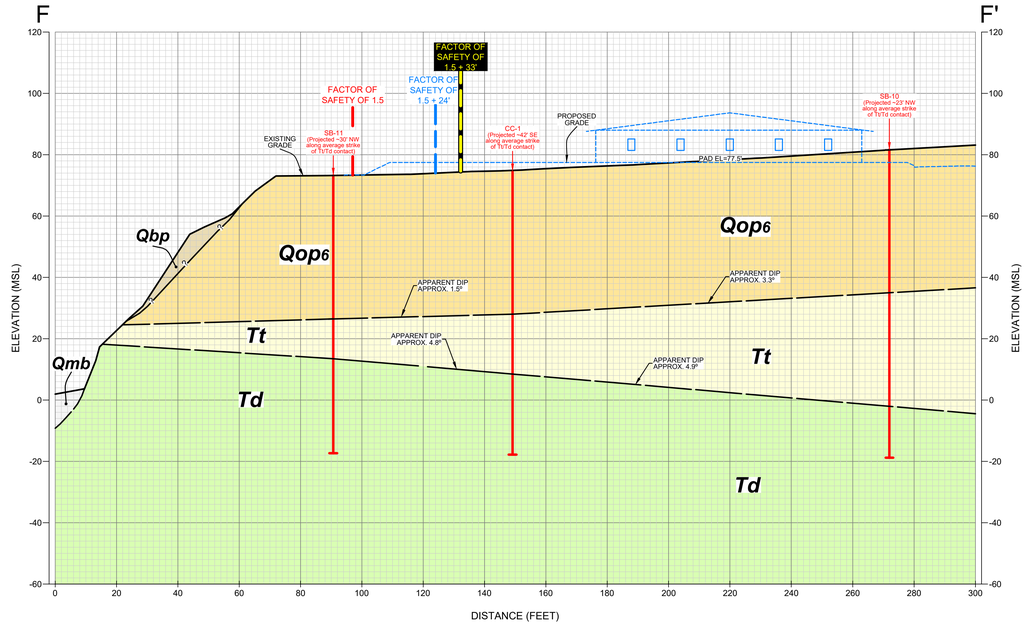
SCALE	1" = 20'	DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04	FIGURE	6
SHEET	1 OF 1		

Plotted:09/09/2019 10:07AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 Cross-Sections_ADAT-EARTHWORKS-PRELIM 2019-08-15.dwg



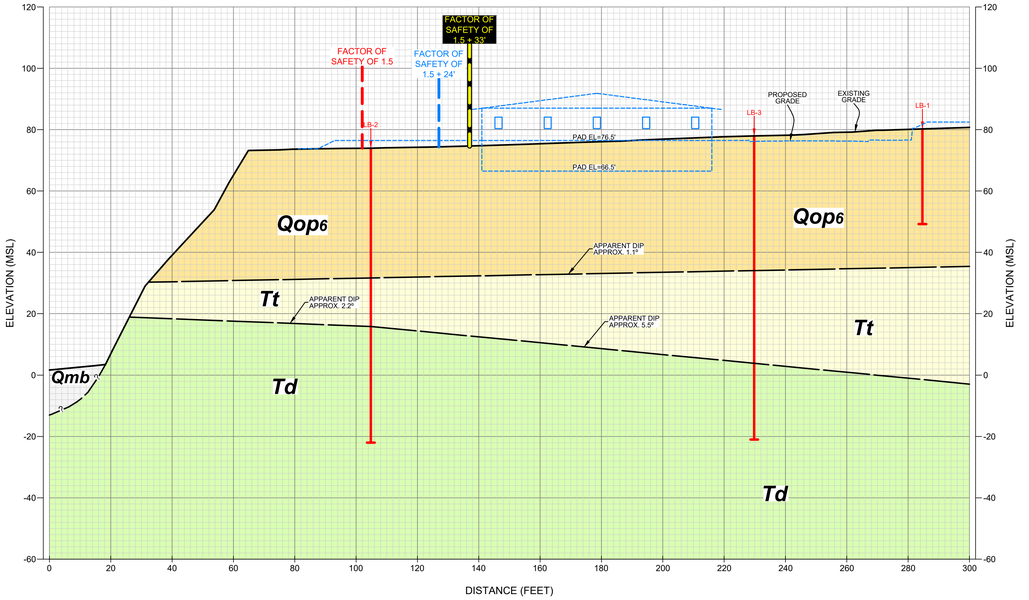
GEOLOGIC CROSS-SECTION E-E'

SCALE: 1" = 20' (Vert. = Horiz.)



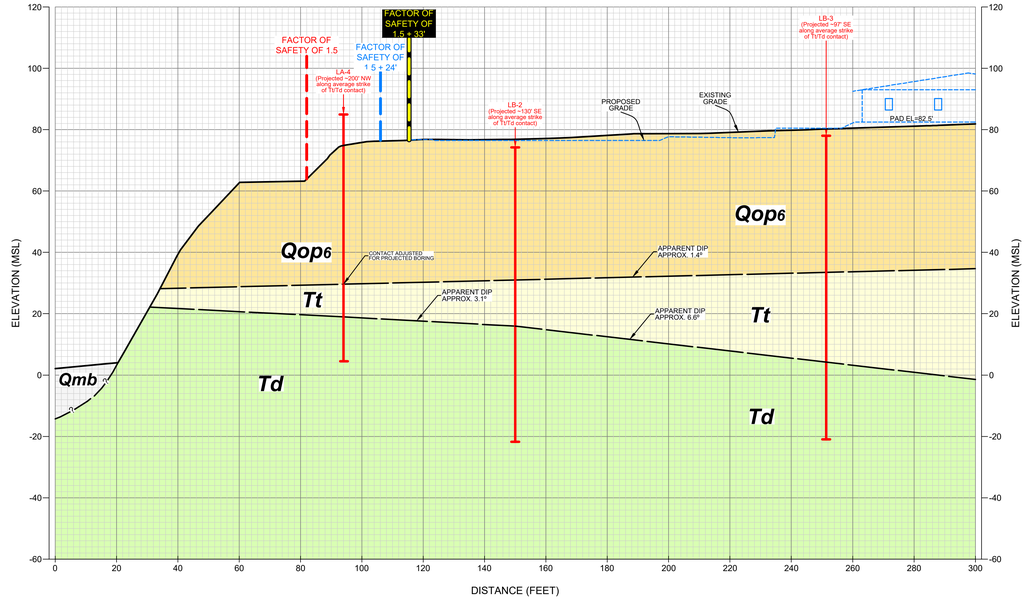
GEOLOGIC CROSS-SECTION F-F'

SCALE: 1" = 20' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION G-G'

SCALE: 1" = 20' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION H-H'

SCALE: 1" = 20' (Vert. = Horiz.)

GEOCON LEGEND

- Qbp ..... BRUSH PILE
- Qmb ..... MARINE BEACH DEPOSIT
- Qop6 ..... OLD PARALIC DEPOSITS
- Tt ..... TORREY SANDSTONE
- Td ..... DEL MAR FORMATION
- SB-6 ..... APPROX. LOCATION OF EXPLORATORY BORING
  - CC....Continuous Core Boring
  - SB....Small-Diameter Boring
  - LB....Large-Diameter Boring
  - LA....Limited Access Boring
- ..... APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOLOGIC CROSS - SECTIONS E, F, G, H

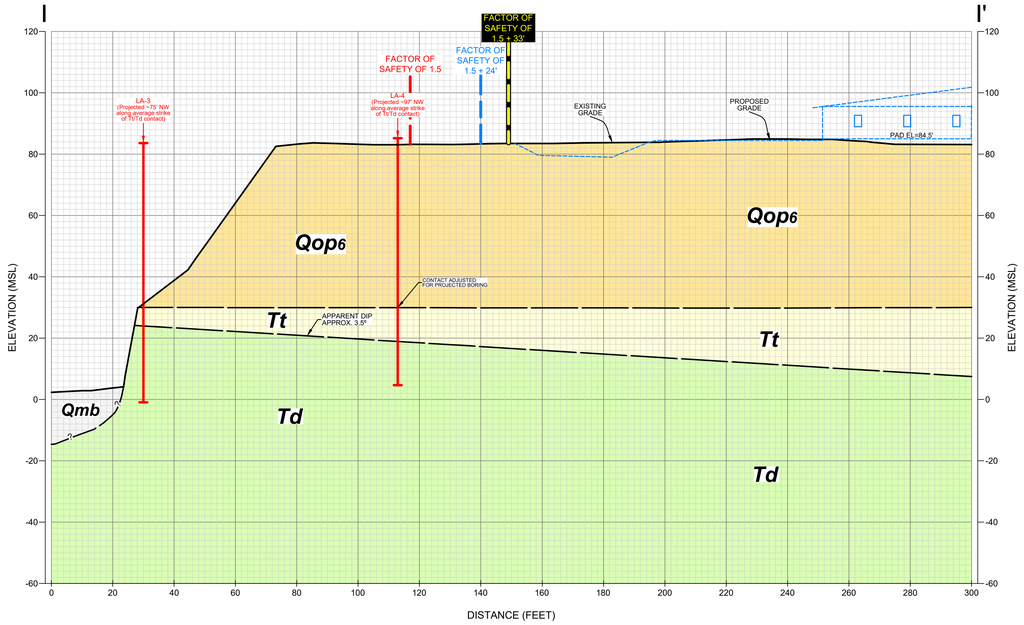
MARISOL

DEL MAR, CALIFORNIA

GEOCON INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
9960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558 6900 - FAX 858 558 6159

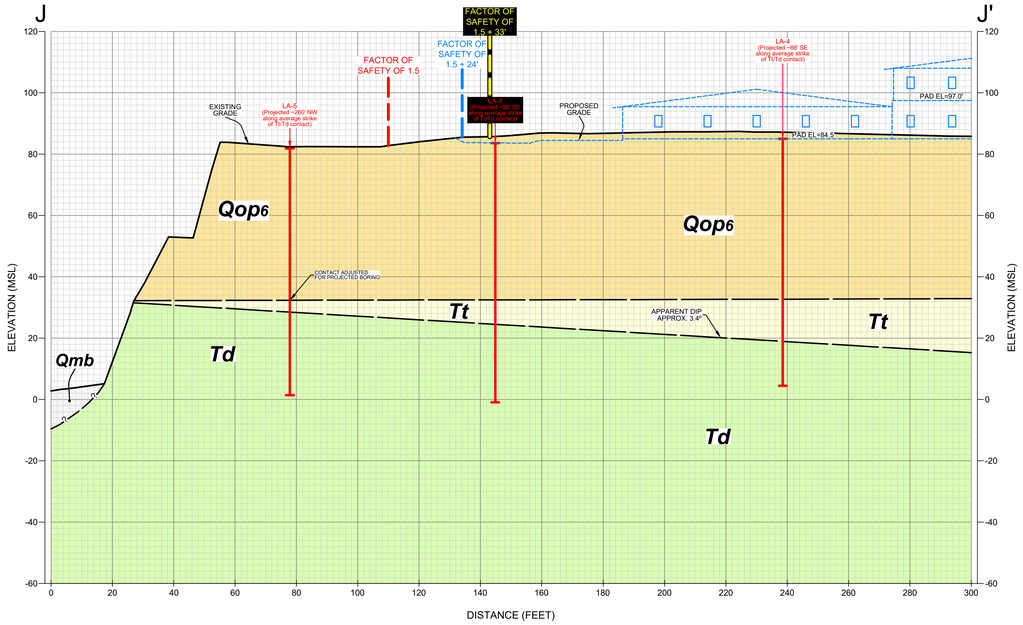
SCALE	1" = 20'	DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04	FIGURE	7
SHEET	1 OF 1		

Plotted:09/09/2019 10:07AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 Cross-Sections_42x11\EARTHWORKS-PRELIM 2019-08-19.dwg



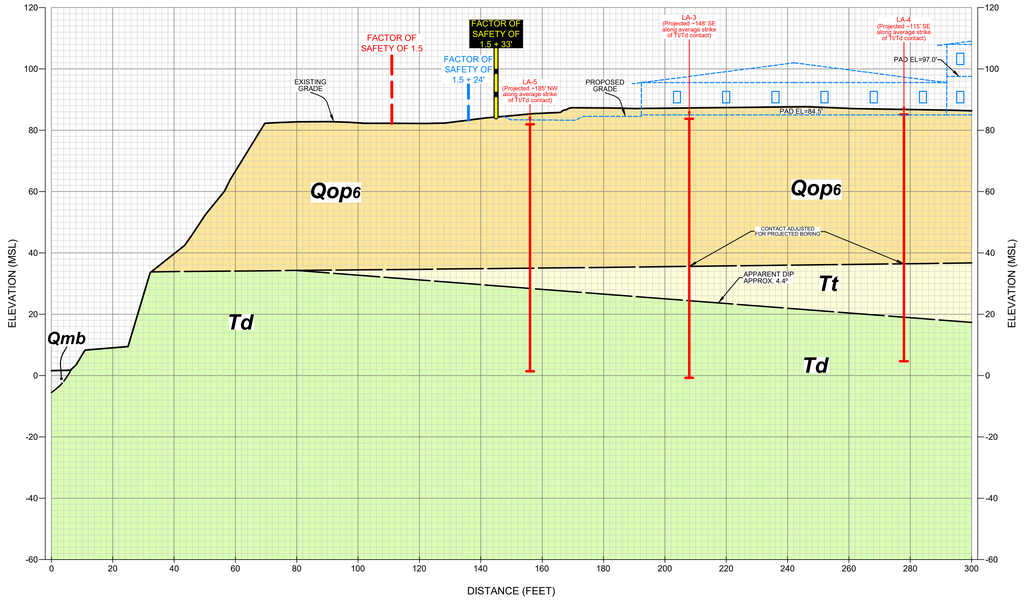
GEOLOGIC CROSS-SECTION I-I'

SCALE: 1" = 20' (Vert. = Horiz.)



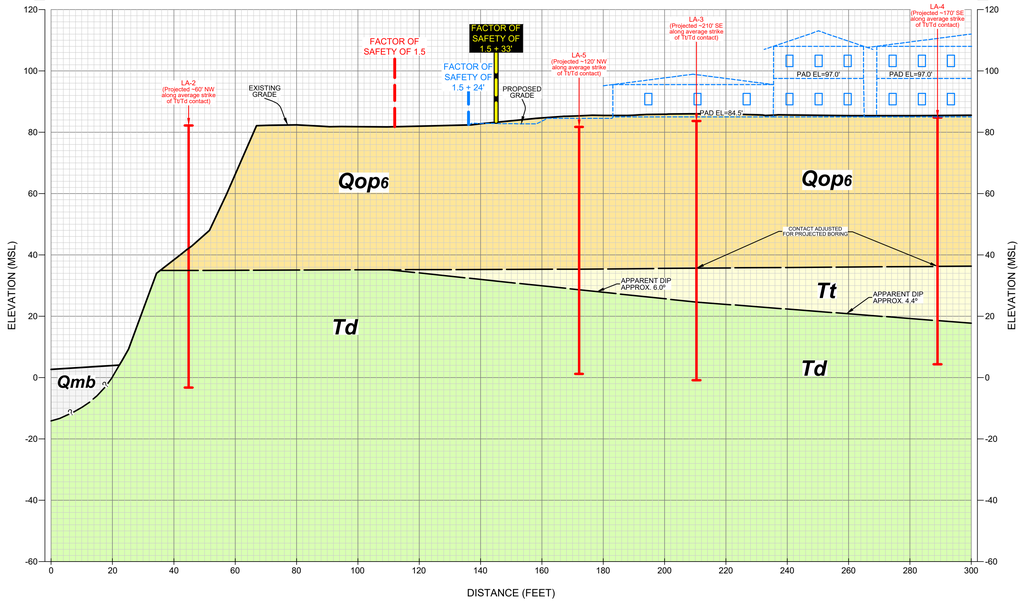
GEOLOGIC CROSS-SECTION J-J'

SCALE: 1" = 20' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION K-K'

SCALE: 1" = 20' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION L-L'

SCALE: 1" = 20' (Vert. = Horiz.)

GEOCON LEGEND

- Qbp ..... BRUSH PILE
- Qmb ..... MARINE BEACH DEPOSIT
- Qop6 ..... OLD PARALIC DEPOSITS
- Tt ..... TORREY SANDSTONE
- Td ..... DEL MAR FORMATION
- SB-6 ..... APPROX. LOCATION OF EXPLORATORY BORING
  - CC....Continuous Core Boring
  - SB....Small-Diameter Boring
  - LB....Large-Diameter Boring
  - LA....Limited Access Boring
- ..... APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOLOGIC CROSS - SECTIONS
I, J, K, L
MARISOL
DEL MAR, CALIFORNIA

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SCALE	1" = 20'
DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04
FIGURE	8
SHEET	1 OF 1

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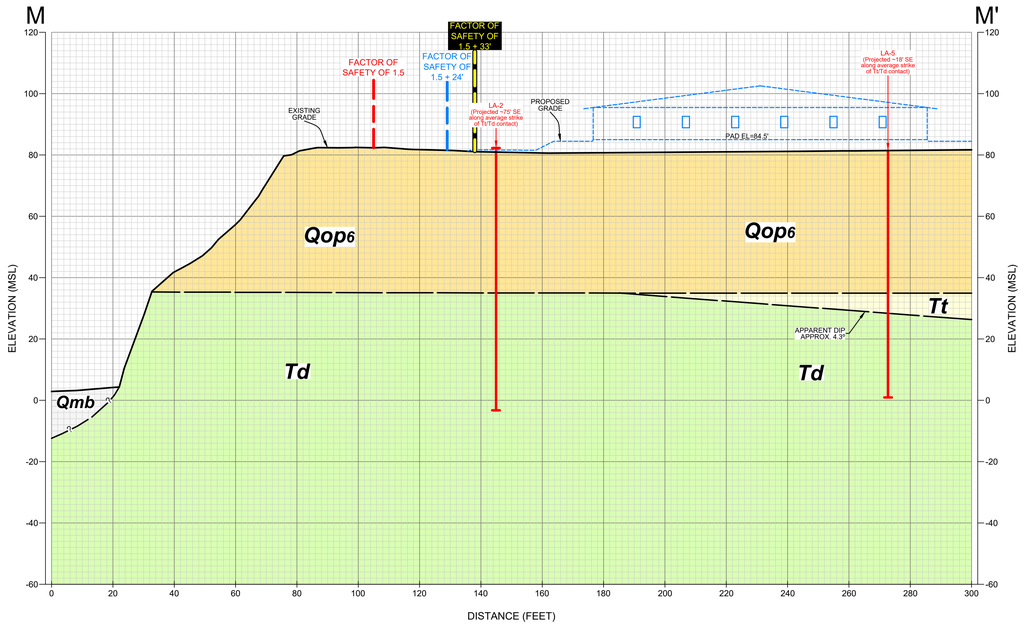
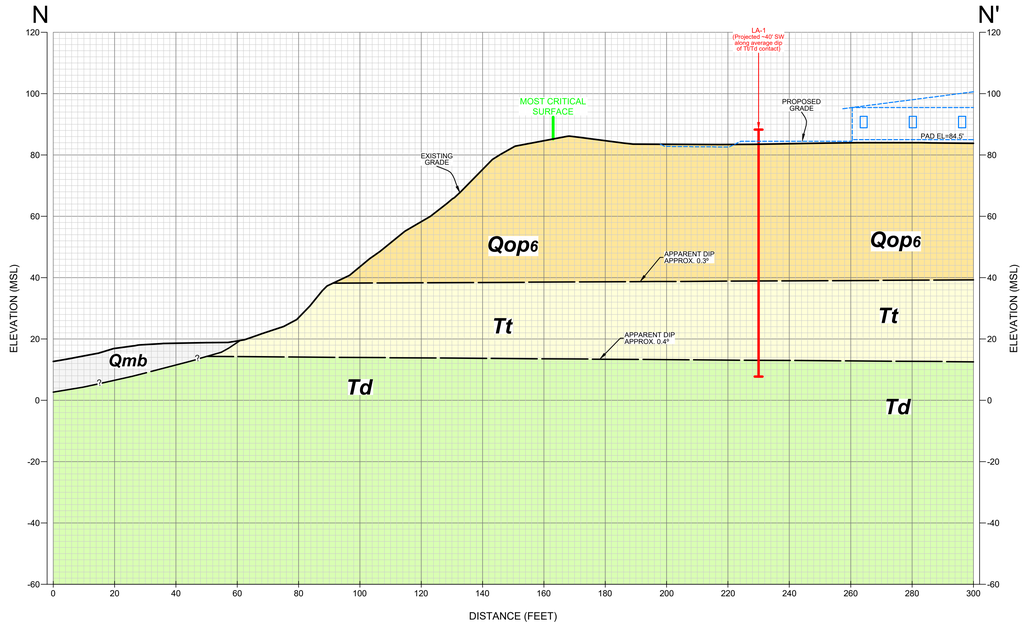


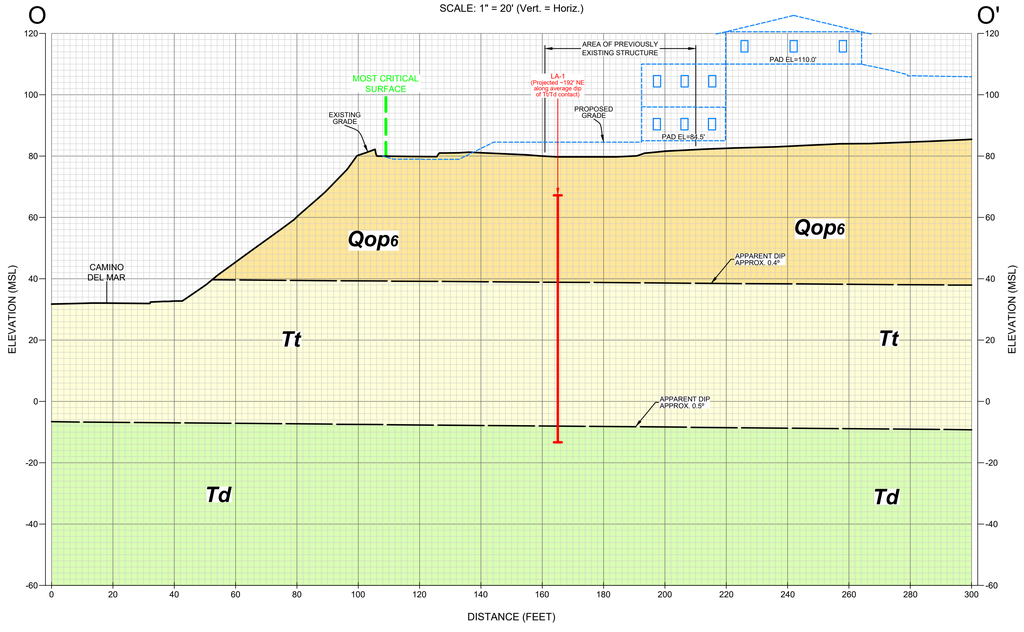
GEOLOGIC CROSS-SECTION M-M'

SCALE: 1" = 20' (Vert. = Horiz.)



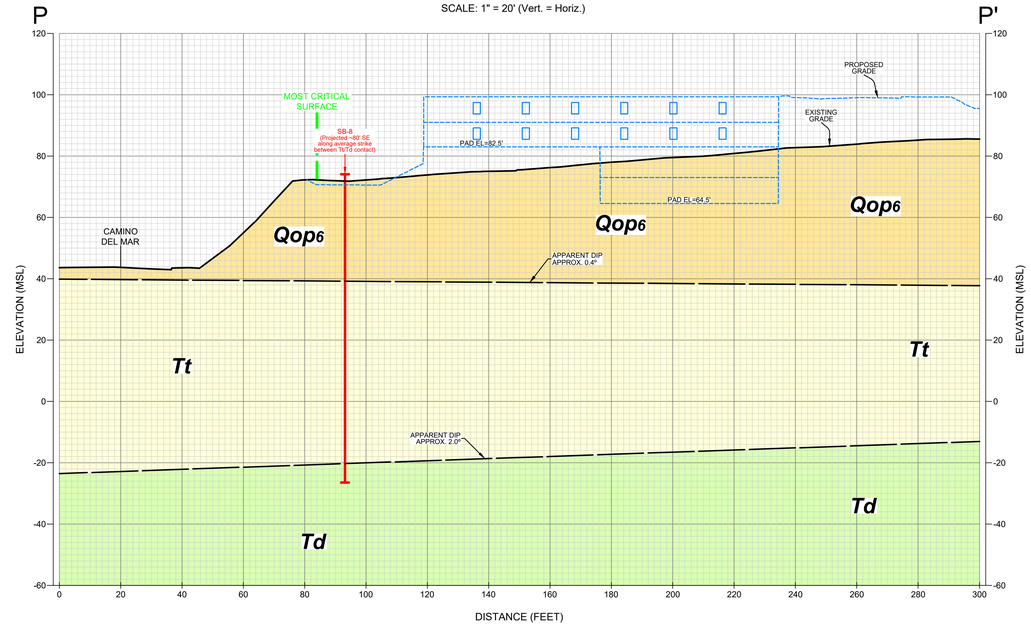
GEOLOGIC CROSS-SECTION N-N'

SCALE: 1" = 20' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION O-O'

SCALE: 1" = 20' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION P-P'

SCALE: 1" = 20' (Vert. = Horiz.)

GEOCON LEGEND

- Qbp ..... BRUSH PILE
- Qmb ..... MARINE BEACH DEPOSIT
- Qop6 ..... OLD PARALIC DEPOSITS
- Tt ..... TORREY SANDSTONE
- Td ..... DEL MAR FORMATION
- SB-6 ..... APPROX. LOCATION OF EXPLORATORY BORING
  - CC ... Continuous Core Boring
  - SB ... Small-Diameter Boring
  - LB ... Large-Diameter Boring
  - LA ... Limited Access Boring
- ..... APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOLOGIC CROSS - SECTIONS M, N, O, P

MARISOL

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PHONE 858 558-6900 - FAX 858 558-6159

SCALE	1" = 20'
DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04
FIGURE	9
SHEET	1 OF 1

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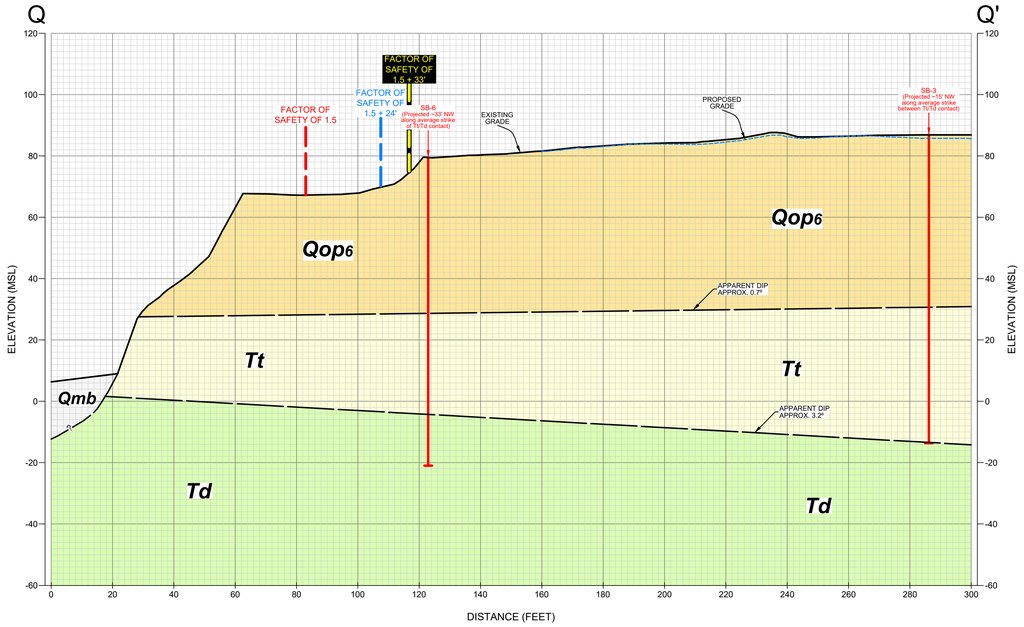
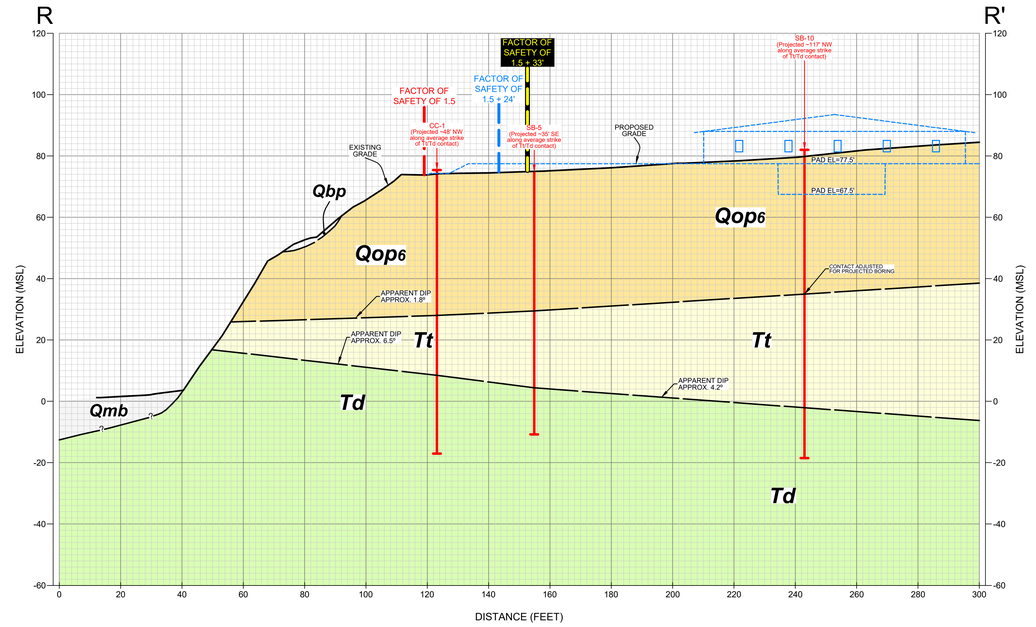


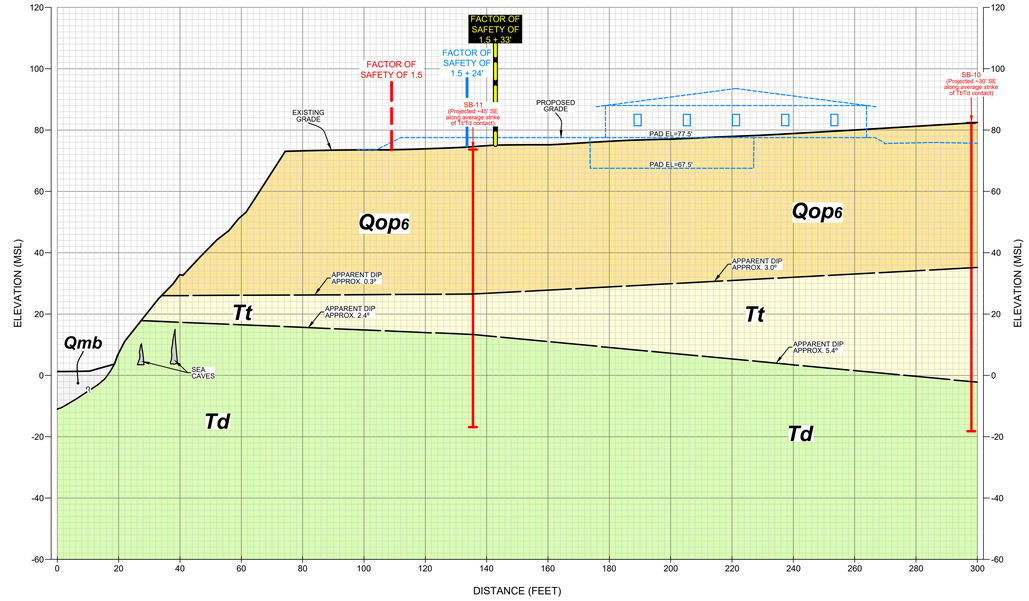
GEOLOGIC CROSS-SECTION Q-Q'

SCALE: 1" = 20' (Vert. = Horiz.)



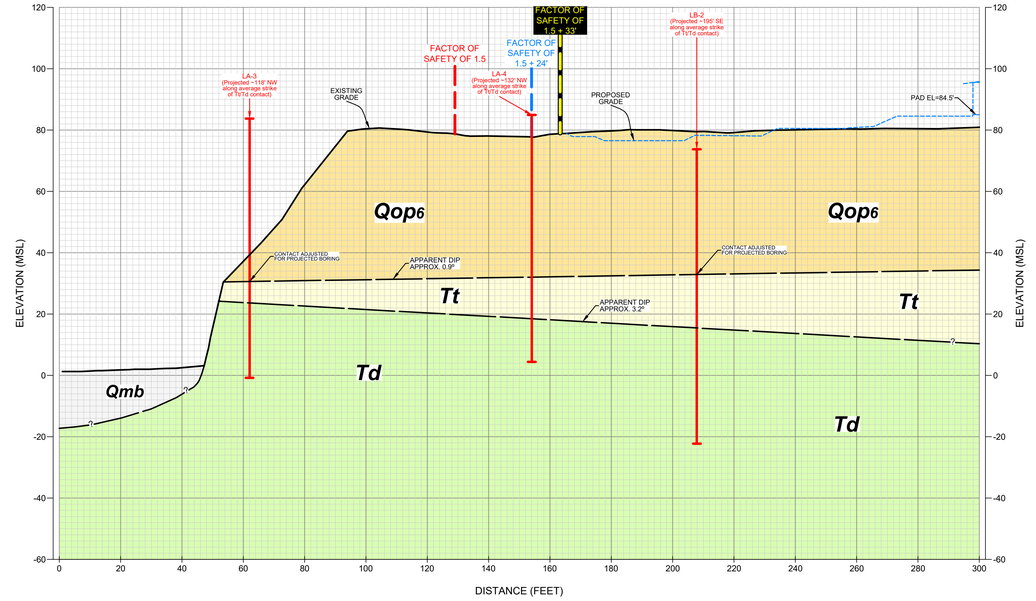
GEOLOGIC CROSS-SECTION R-R'

SCALE: 1" = 20' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION S-S'

SCALE: 1" = 20' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION T-T'

SCALE: 1" = 20' (Vert. = Horiz.)

GEOCON LEGEND

- **Qbp** ..... BRUSH PILE
- **Qmb** ..... MARINE BEACH DEPOSIT
- **Qop6** ..... OLD PARALIC DEPOSITS
- **Tt** ..... TORREY SANDSTONE
- **Td** ..... DEL MAR FORMATION
- SB-6 ..... APPROX. LOCATION OF EXPLORATORY BORING
  - CC....Continuous Core Boring
  - SB....Small-Diameter Boring
  - LB....Large-Diameter Boring
  - LA....Limited Access Boring
- ?~? ..... APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOLOGIC CROSS - SECTIONS
Q, R, S, T
MARISOL
DEL MAR, CALIFORNIA

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6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
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SCALE	1" = 20'	DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04	FIGURE	10
SHEET	1 OF 1		

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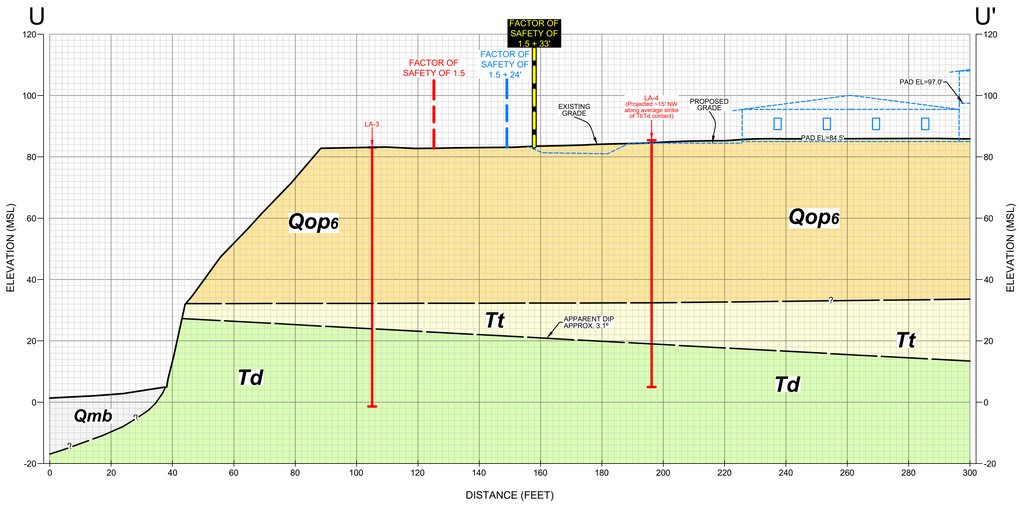
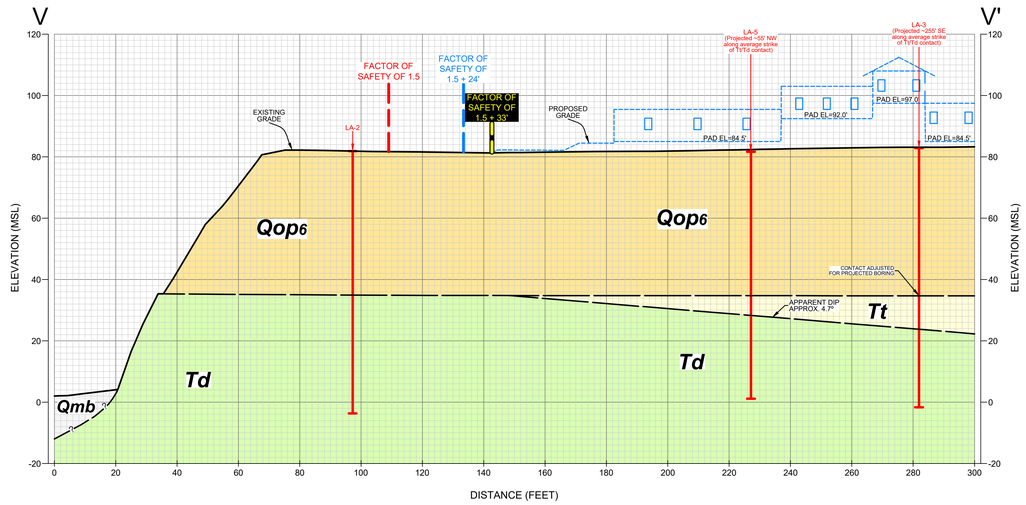


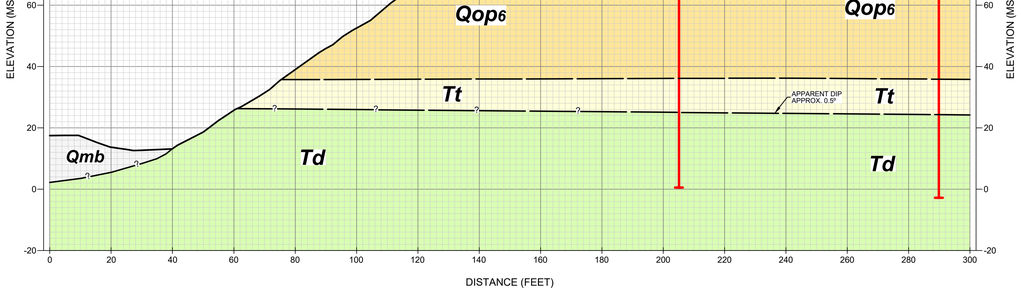
GEOLOGIC CROSS-SECTION U-U'

SCALE: 1" = 20' (Vert. = Horiz.)



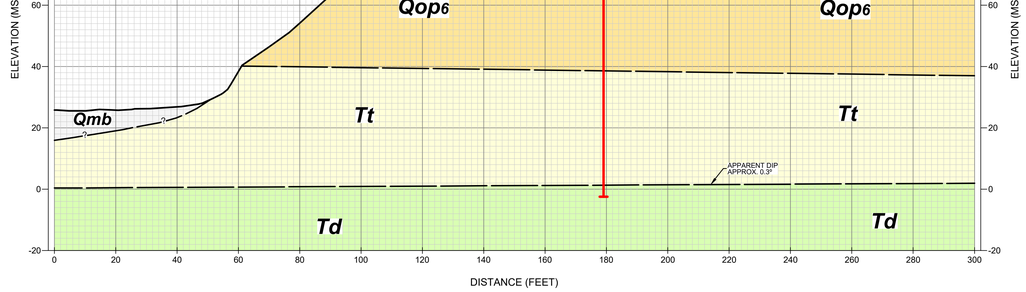
GEOLOGIC CROSS-SECTION V-V'

SCALE: 1" = 20' (Vert. = Horiz.)



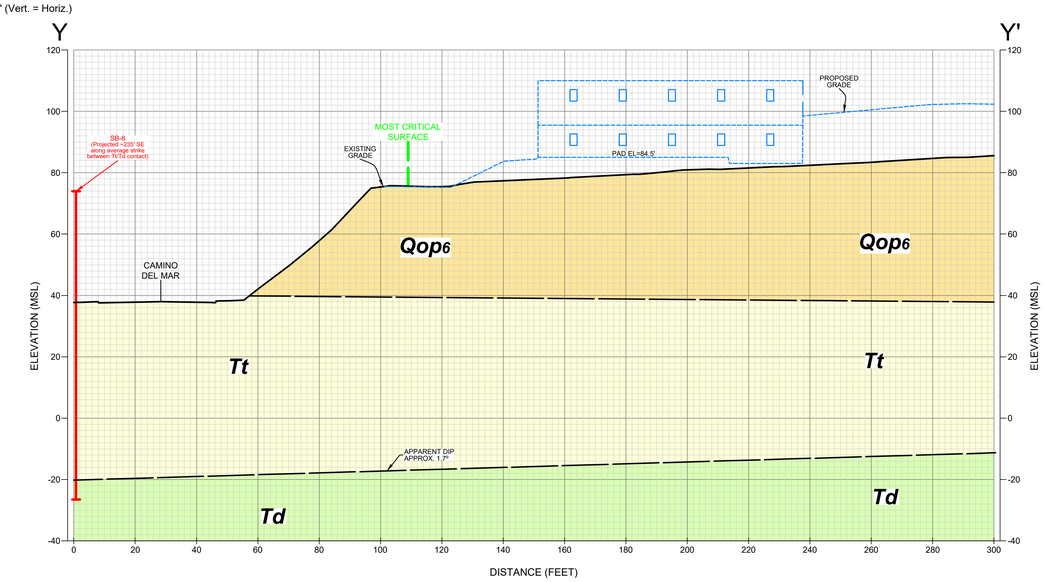
GEOLOGIC CROSS-SECTION W-W'

SCALE: 1" = 20' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION X-X'

SCALE: 1" = 20' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION Y-Y'

SCALE: 1" = 20' (Vert. = Horiz.)

GEOCON LEGEND

- Qbp ..... BRUSH PILE
- Qmb ..... MARINE BEACH DEPOSIT
- Qop6 ..... OLD PARALIC DEPOSITS
- Tt ..... TORREY SANDSTONE
- Td ..... DEL MAR FORMATION
- SB-6 ..... APPROX. LOCATION OF EXPLORATORY BORING
  - CC....Continuous Core Boring
  - SB....Small-Diameter Boring
  - LB....Large-Diameter Boring
  - LA....Limited Access Boring
- ..... APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOLOGIC CROSS - SECTIONS U, V, W, X, Y

MARISOL

DEL MAR, CALIFORNIA

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PHONE 858 558-6900 - FAX 858 558-6159

SCALE	1" = 20'	DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04	FIGURE	11
SHEET	1 OF 1		

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2013 AERIAL PHOTOGRAPH OF BLUFF

MARISOL

DEL MAR, CALIFORNIA

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GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

NOT TO SCALE	DATE 09 - 06 - 2019		
PROJECT NO. G1710 - 32 - 04		FIGURE 12	
SHEET 1 OF 1			

GEOCON LEGEND

Qmb .....MARINE BEACH DEPOSIT

Qop6 .....OLD PARALIC DEPOSITS

Tt .....TORREY SANDSTONE

Td .....DEL MAR FORMATION

— — — .....APPROX. LOCATION OF GEOLOGIC CONTACT

Plotted:09/09/2019 10:08AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 AerialPhotograpgh-BluffFace.dwg

2013 AERIAL PHOTOGRAPH OF BLUFF
MARISOL
DEL MAR, CALIFORNIA

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NOT TO SCALE	DATE 09 - 06 - 2019
PROJECT NO. G1710 - 32 - 04	FIGURE 13
SHEET 1 OF 1	

GEOCON LEGEND

Qmb .....MARINE BEACH DEPOSIT
Qop6 .....OLD PARALIC DEPOSITS
Tt .....TORREY SANDSTONE
Td .....DEL MAR FORMATION
.....APPROX. LOCATION OF GEOLOGIC CONTACT

Plotted:09/09/2019 10:08AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 AerialPhotograpgh-BluffFace.dwg

2013 AERIAL PHOTOGRAPH OF BLUFF
MARISOL
DEL MAR, CALIFORNIA

GEOCON INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
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NOT TO SCALE	DATE 09 - 06 - 2019	
PROJECT NO. G1710 - 32 - 04		FIGURE 14
SHEET 1 OF 1		

GEOCON LEGEND

Qmb .....MARINE BEACH DEPOSIT
Qop6 .....OLD PARALIC DEPOSITS
Tt .....TORREY SANDSTONE
Td .....DEL MAR FORMATION
– – – .....APPROX. LOCATION OF GEOLOGIC CONTACT

BLUFF FACE EROSION FROM WATER FLOWING OVER THE TOP OF THE SLOPE

Qop6

Tt

Td

Plotted:09/09/2019 10:08AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 AerialPhotograpgh-BluffFace.dwg

2013 AERIAL PHOTOGRAPH OF BLUFF

MARISOL

DEL MAR, CALIFORNIA

GEOCON INCORPORATED

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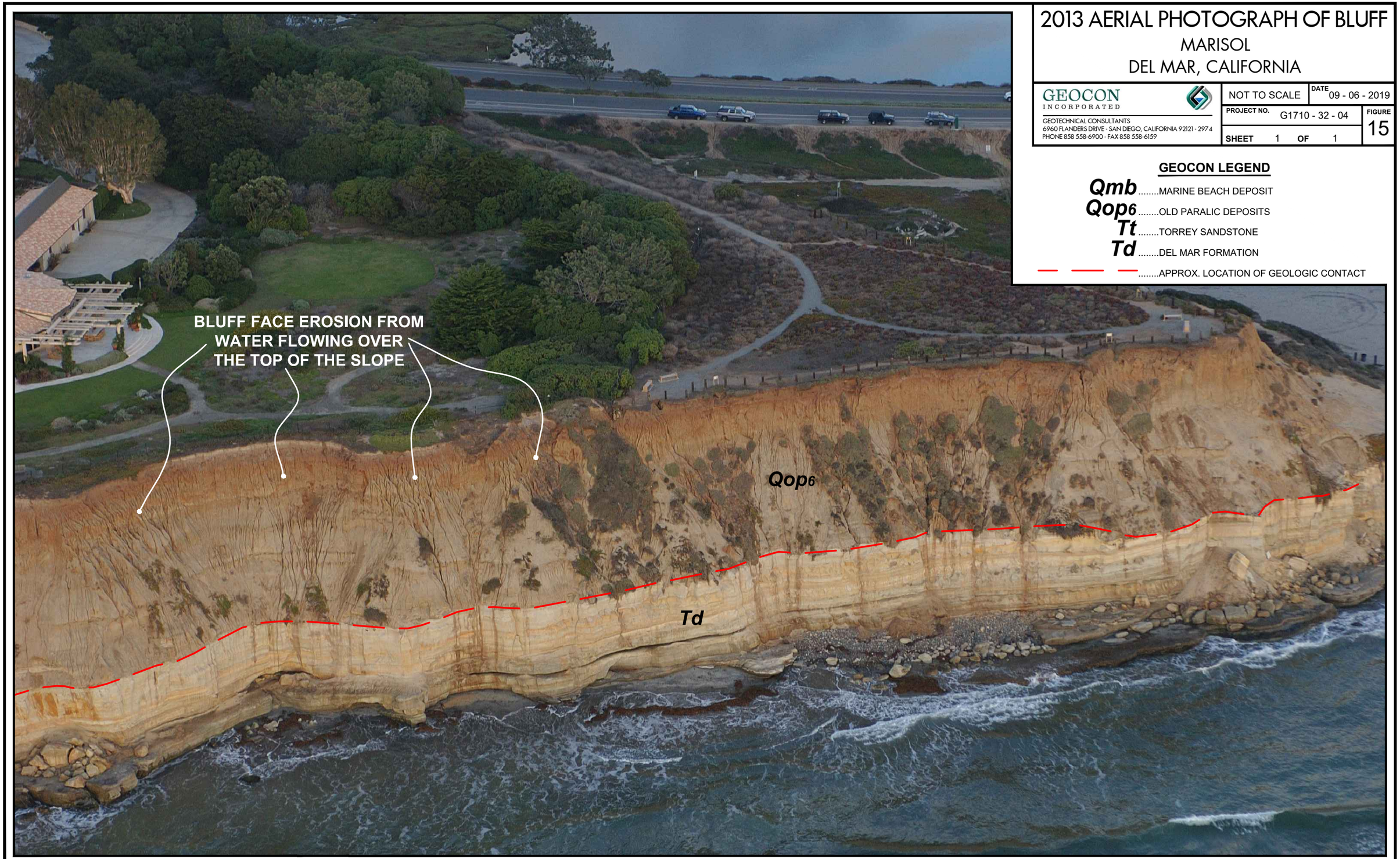
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

NOT TO SCALE	DATE 09 - 06 - 2019	
PROJECT NO. G1710 - 32 - 04		FIGURE 15
SHEET 1 OF 1		

GEOCON LEGEND

Qmb .....MARINE BEACH DEPOSIT
Qop6 .....OLD PARALIC DEPOSITS
Tt .....TORREY SANDSTONE
Td .....DEL MAR FORMATION
— — — .....APPROX. LOCATION OF GEOLOGIC CONTACT



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2002 AERIAL PHOTOGRAPH OF BLUFF

MARISOL

DEL MAR, CALIFORNIA

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NOT TO SCALE	DATE 09 - 06 - 2019	
PROJECT NO. G1710 - 32 - 04		FIGURE 16
SHEET 1 OF 1		

GEOCON LEGEND

Qmb .....MARINE BEACH DEPOSIT

Qop6 .....OLD PARALIC DEPOSITS

Tt .....TORREY SANDSTONE

Td .....DEL MAR FORMATION

— — — .....APPROX. LOCATION OF GEOLOGIC CONTACT

BLUFF FACE EROSION FROM WATER FLOWING OVER THE TOP OF THE SLOPE

Qop6

Td

Qmb

Plotted:09/09/2019 10:08AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 AerialPhotograpgh-BluffFace.dwg

0' 50' 100' 150' 200'

SCALE 1"=50' (On 42x30)

LEGEND

- SHORELINE PROTECTION LINE
- TOE/TOP OF BLUFF LINE YEAR 2016
- TOE/TOP OF BLUFF LINE YEAR 1986
- TOE/TOP OF BLUFF LINE YEAR 1953

BLUFF RETREAT EXHIBIT

MARISOL
DEL MAR, CALIFORNIA

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6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

SCALE	1" = 50'	DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04	FIGURE	17
SHEET	1 OF 1		

Plotted:09/09/2019 10:09AM | By:RUBEN.AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 PDC Exhibit.dwg

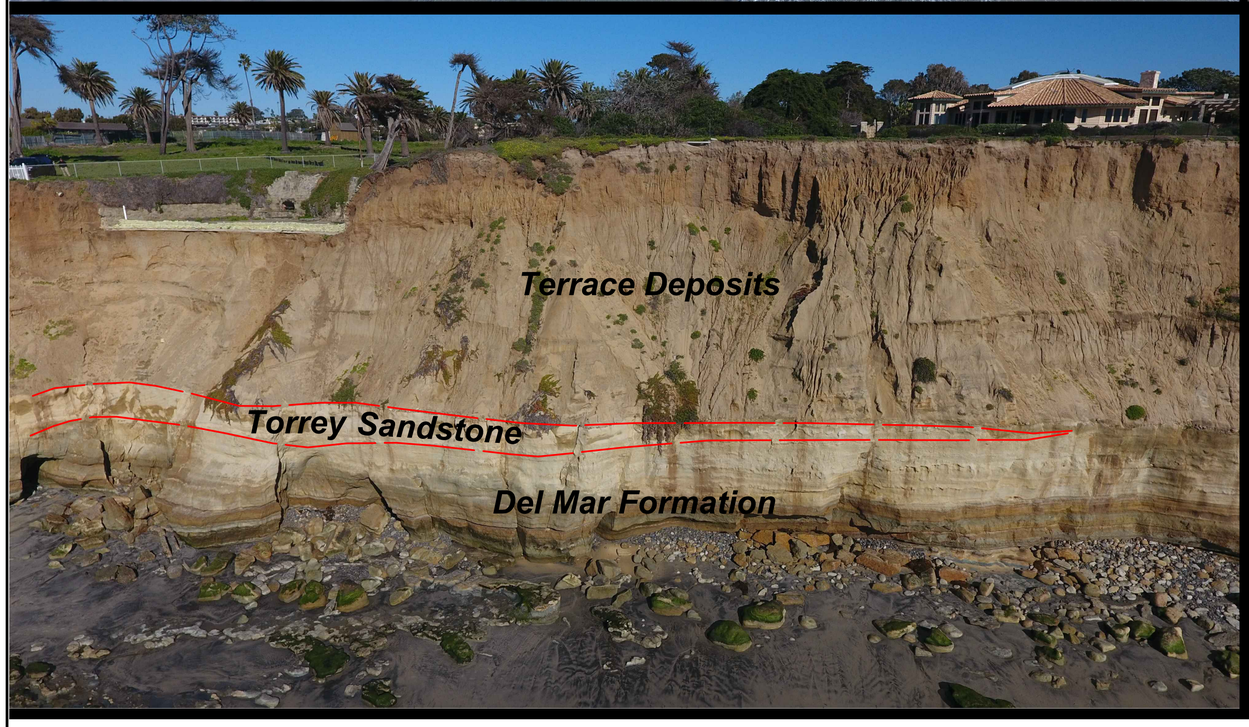
UNIQUE GEOLOGIC SETTING AT NORTH BEACH DEL MAR

PROJECT SITE MID SECTION

PROJECT SITE SOUTH SECTION

PROJECT SITE NORTH SECTION

PROJECT SITE MID SECTION



UNIQUE GEOLOGIC SETTING AT NORTH BEACH

MARISOL

DEL MAR, CALIFORNIA

GEOCON INCORPORATED

GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974

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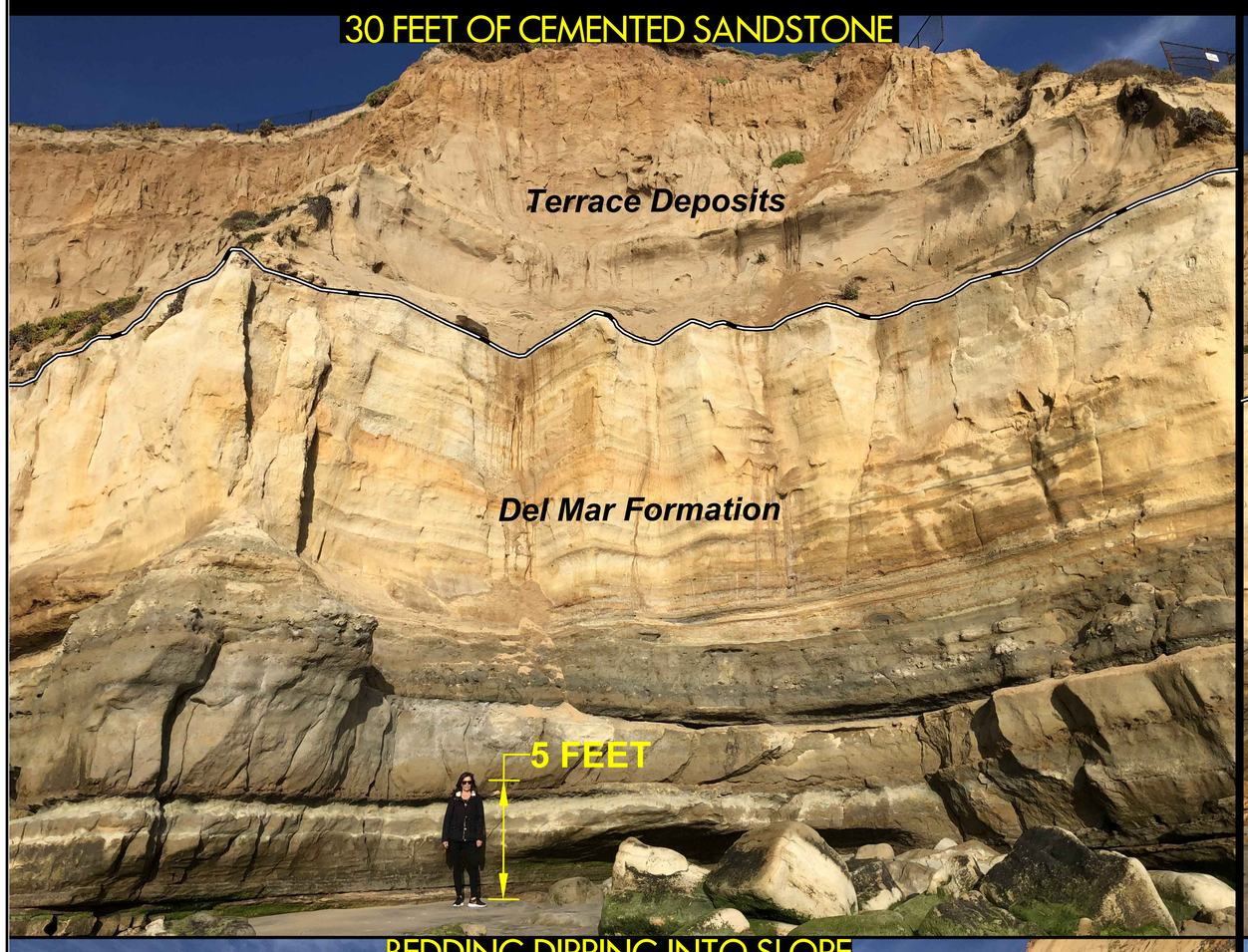
SCALE	DATE	FIGURE
NOT TO SCALE	09 - 06 - 2019	18
PROJECT NO. G1710 - 32 - 04		
SHEET 1 OF 1		

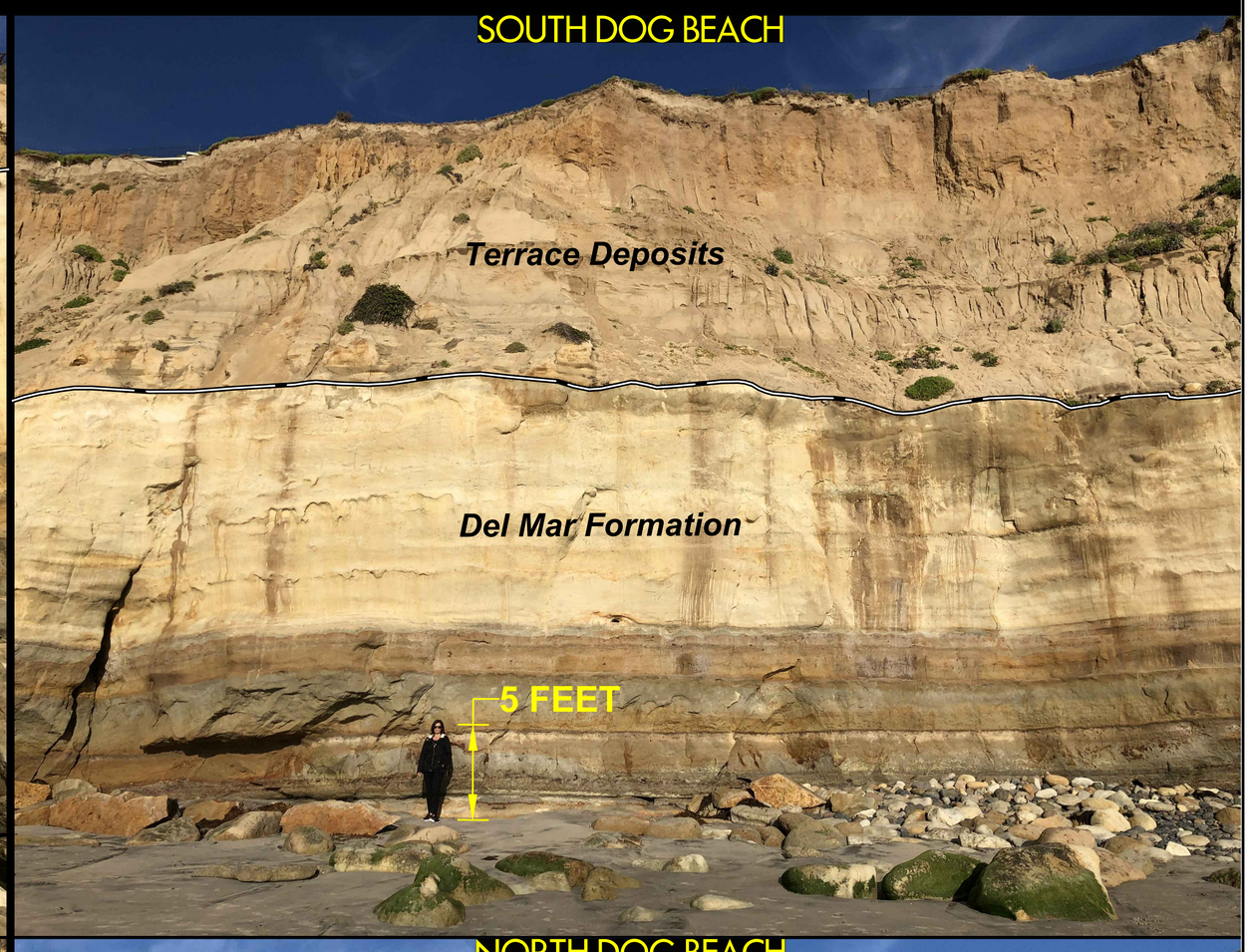
Plotted:09/09/2019 10:08AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 UniqueGeologicSetting-NorthBeach.dwg

NATURAL SEA WALL

30 FEET OF CEMENTED SANDSTONE



SOUTH DOG BEACH



BEDDING DIPPING INTO SLOPE

NORTH DOG BEACH

CENTRAL DOG BEACH

NATURAL SEA WALL

MARISOL
DEL MAR, CALIFORNIA

GEOCON INCORPORATED
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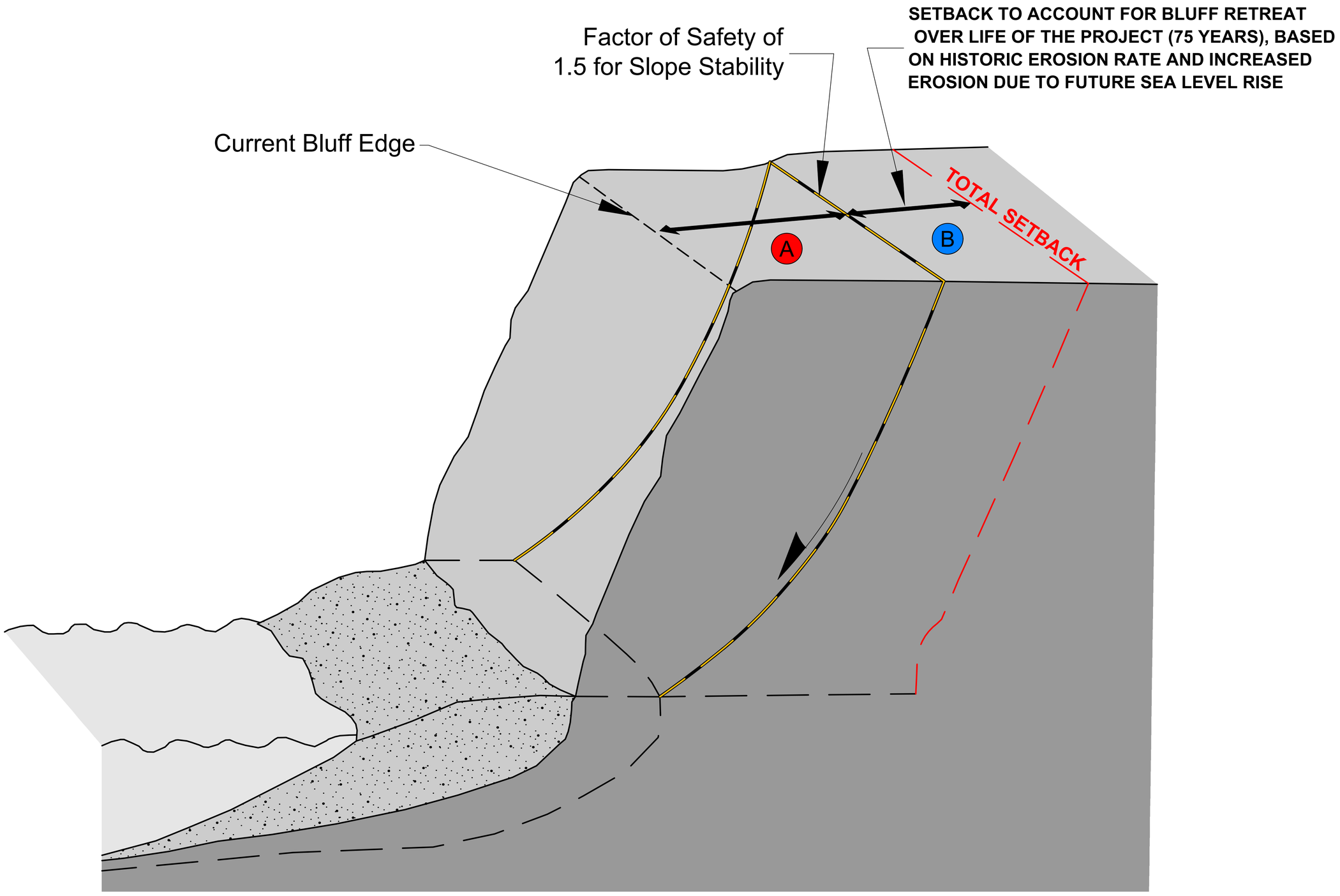
PHONE 858 558-6900 - FAX 858 558-6159

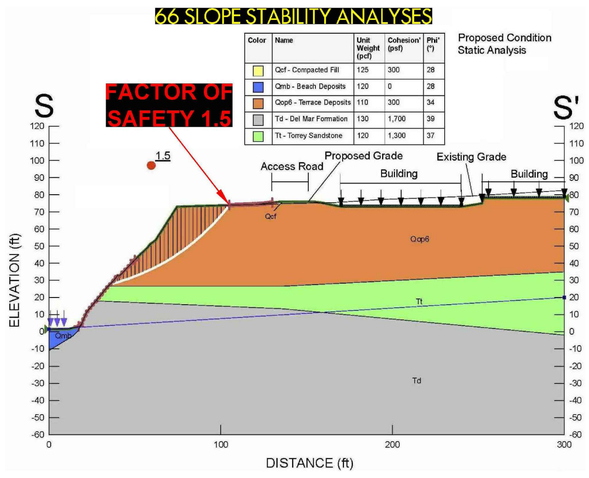
SCALE NOT TO SCALE	DATE 09 - 06 - 2019		
PROJECT NO. G1710 - 32 - 04		FIGURE 19	
SHEET 1 OF 1			

Plotted:09/09/2019 10:09AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 NaturalSeaWall.dwg

DETERMINATION OF PROJECT SETBACK LIMITS



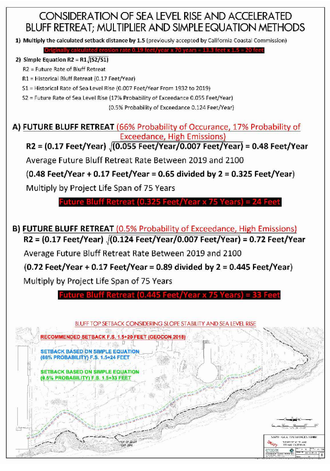
A **SETBACK TO ACHIEVE A FACTOR OF SAFETY OF 1.5 FOR SLOPE STABILITY**



Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qcp6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

B **SETBACK TO ACCOUNT FOR BLUFF RETREAT OVER LIFE OF THE PROJECT (75 YEARS), BASED ON HISTORIC EROSION RATE AND INCREASED EROSION DUE TO FUTURE SEA LEVEL RISE**

A + B = **TOTAL SETBACK**



DETERMINATION OF PROJECT SETBACK LIMITS

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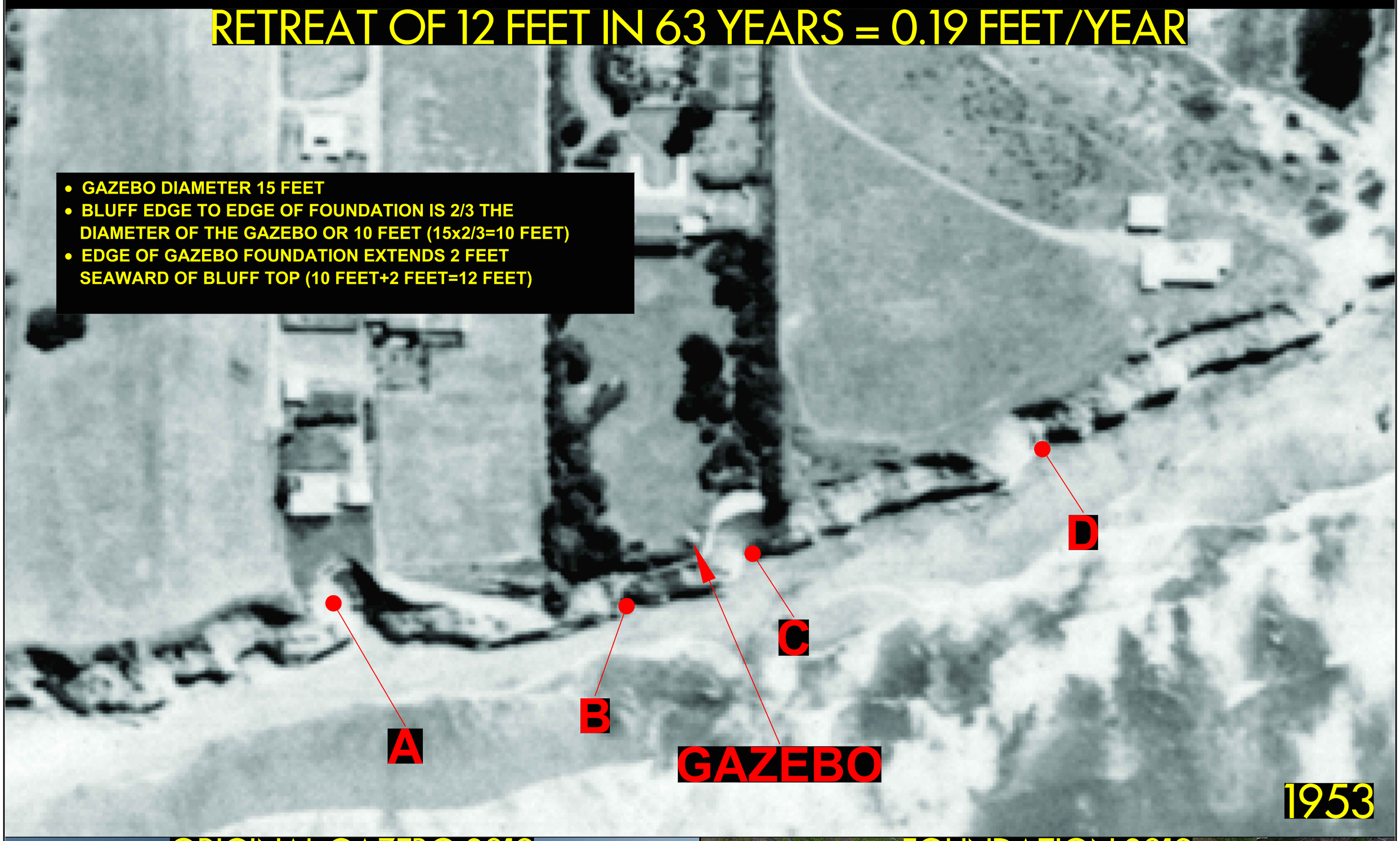
SCALE	DATE
NOT TO SCALE	09 - 06 - 2019
PROJECT NO. G1710 - 32 - 04	FIGURE 20
SHEET 1 OF 1	

Plotted:09/09/2019 10:09AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 Determination-ProjectSetbackLimits.dwg

HISTORIC EROSION RATE CALCULATION BASED ON GAZEBO STRUCTURE

RETREAT OF 12 FEET IN 63 YEARS = 0.19 FEET/YEAR

- GAZEBO DIAMETER 15 FEET
- BLUFF EDGE TO EDGE OF FOUNDATION IS 2/3 THE DIAMETER OF THE GAZEBO OR 10 FEET (15x2/3=10 FEET)
- EDGE OF GAZEBO FOUNDATION EXTENDS 2 FEET SEAWARD OF BLUFF TOP (10 FEET+2 FEET=12 FEET)



HISTORIC EROSION RATE BASED ON GAZEBO

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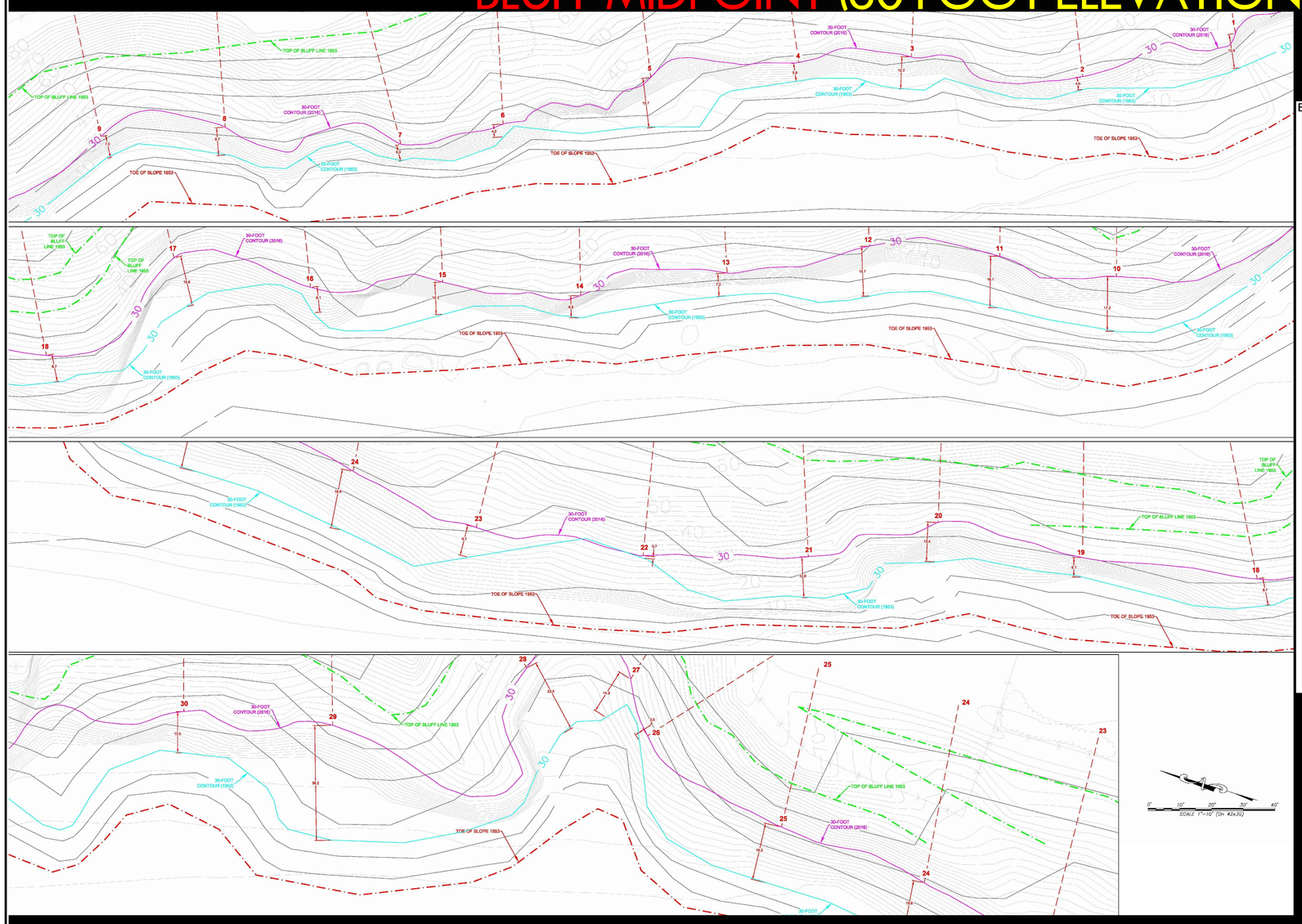
SCALE	NOT TO SCALE	DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04	FIGURE	21
SHEET	1 OF 1		

Plotted:09/09/2019 10:10AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 HistoricErosionRateBasedOnGazebo.dwg

DETERMINATION OF HISTORIC BLUFF EROSION RATES BASED ON SITE SPECIFIC MEASUREMENTS; 30 TRANSECTS, 50 FEET APART; 20 AND 30 FOOT ELEVATION CONTOURS 1953 TO 2016

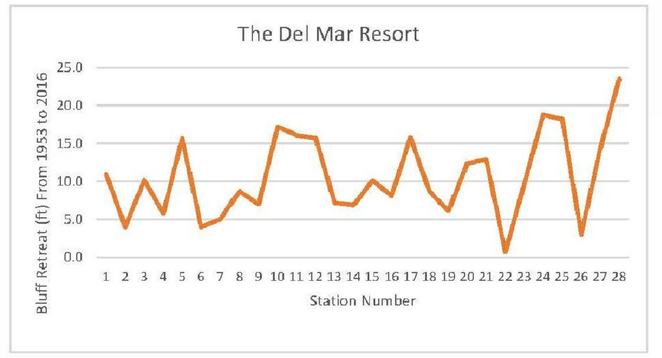
BLUFF MIDPOINT (30 FOOT ELEVATION CONTOUR)

TERRACE DEPOSIT
TORREY SANDSTONE
DELMAR FORMATION



Bluff Retreat Measurements from 1953 to 2016 (63 years)

Station No	ft
1	10.9
2	4.0
3	10.2
4	5.8
5	15.7
6	4.0
7	5.0
8	8.7
9	7.0
10	17.2
11	16.1
12	15.7
13	7.2
14	6.9
15	10.1
16	8.1
17	15.8
18	8.7
19	6.1
20	12.4
21	12.9
22	0.7
23	9.7
24	18.8
25	18.2
26	3.0
27	14.3
28	23.5
29	33.8
30	13.5
MEAN	10.6
MEDIAN	9.9
STANDARD DEV	5.5



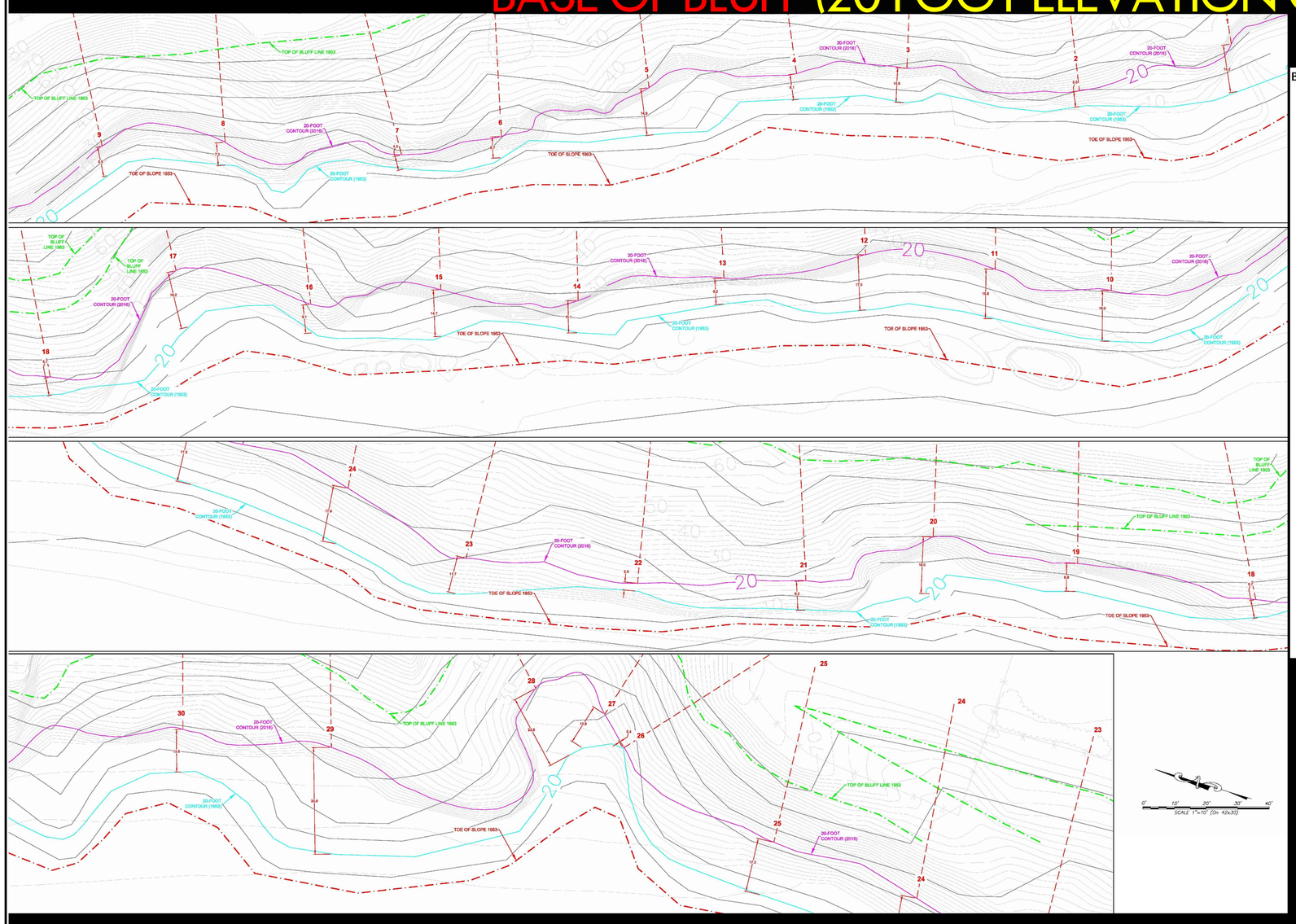
TOPOGRAPHIC MAP MEASUREMENTS
10.6 FEET IN 63 YEARS = 0.17 FEET/YEAR

0.17 FEET/YEAR

* Data Not Used
* Data Not Used

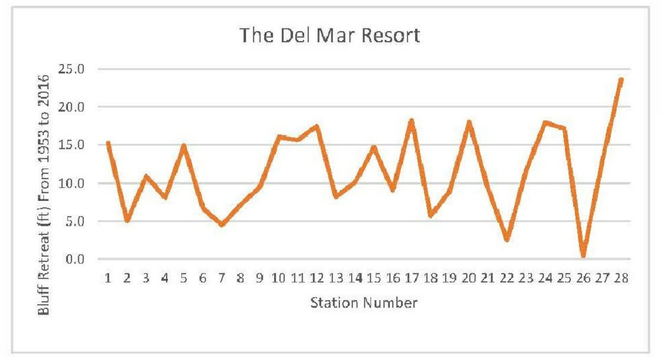
BASE OF BLUFF (20 FOOT ELEVATION CONTOUR)

TORREY SANDSTONE
DELMAR FORMATION



Bluff Retreat Measurements from 1953 to 2016 (63 years)

Station No	ft
1	15.2
2	5.0
3	10.9
4	8.1
5	14.9
6	6.7
7	4.5
8	7.2
9	9.5
10	16.0
11	15.6
12	17.5
13	8.2
14	10.1
15	14.7
16	9.1
17	18.2
18	5.7
19	8.9
20	18.0
21	9.2
22	2.5
23	11.7
24	17.9
25	17.2
26	0.4
27	12.8
28	23.6
29	33.8
30	13.5
MEAN	11.4
MEDIAN	10.5
STANDARD DEV	5.5



TOPOGRAPHIC MAP MEASUREMENTS
11.4 FEET IN 63 YEARS = 0.18 FEET/YEAR

0.18 FEET/YEAR

* Data Not Used
* Data Not Used

HISTORIC BLUFF EROSION RATE EXHIBIT

MARISOL
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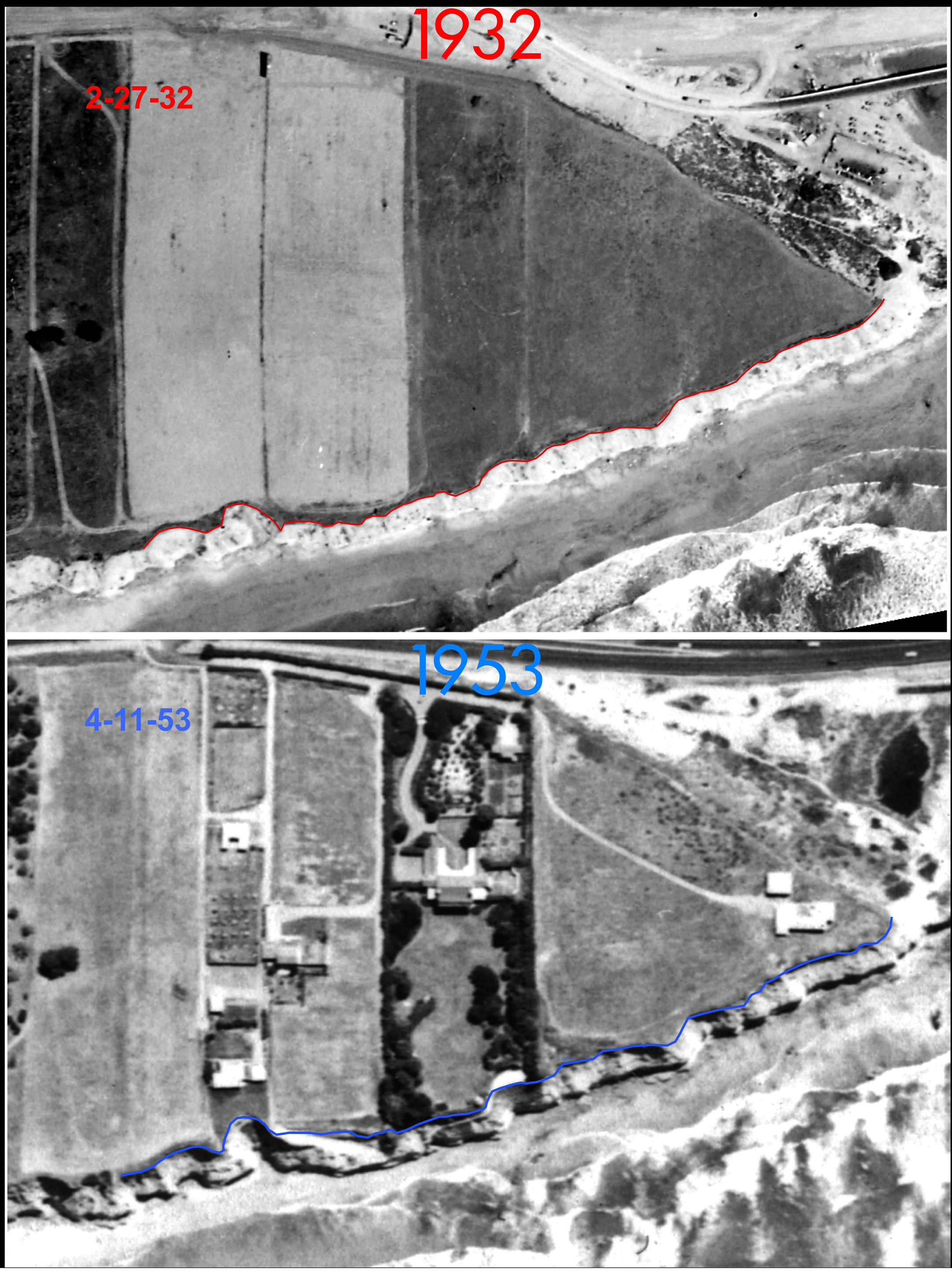
SCALE NOT TO SCALE | DATE 09 - 06 - 2019
PROJECT NO. G1710 - 32 - 04 | FIGURE 22
SHEET 1 OF 1

Plotted:09/09/2019 10:10AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 HistoricBluffErosionRates.dwg

TOP OF BLUFF DETERMINATION ON HISTORIC PHOTOGRAPHS USING STEREO IMAGES



1932, 1953 TOP OF BLUFF DETERMINATIONS			
MARISOL DEL MAR, CALIFORNIA			
GEOCON INCORPORATED GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974 PHONE 858 558-6900 - FAX 858 558-6159	SCALE NOT TO SCALE	DATE 09 - 06 - 2019	
	PROJECT NO. G1710 - 32 - 04		FIGURE 23
	SHEET 1 OF 1		

Plotted:09/09/2019 10:10AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 1932&1953If-DeterminationHistoricPhotographs.dwg

TOP OF BLUFF DETERMINATION USING A RECENT AERIAL PHOTO

2019 TOP OF BLUFF DETERMINATION

MARISOL
DEL MAR, CALIFORNIA

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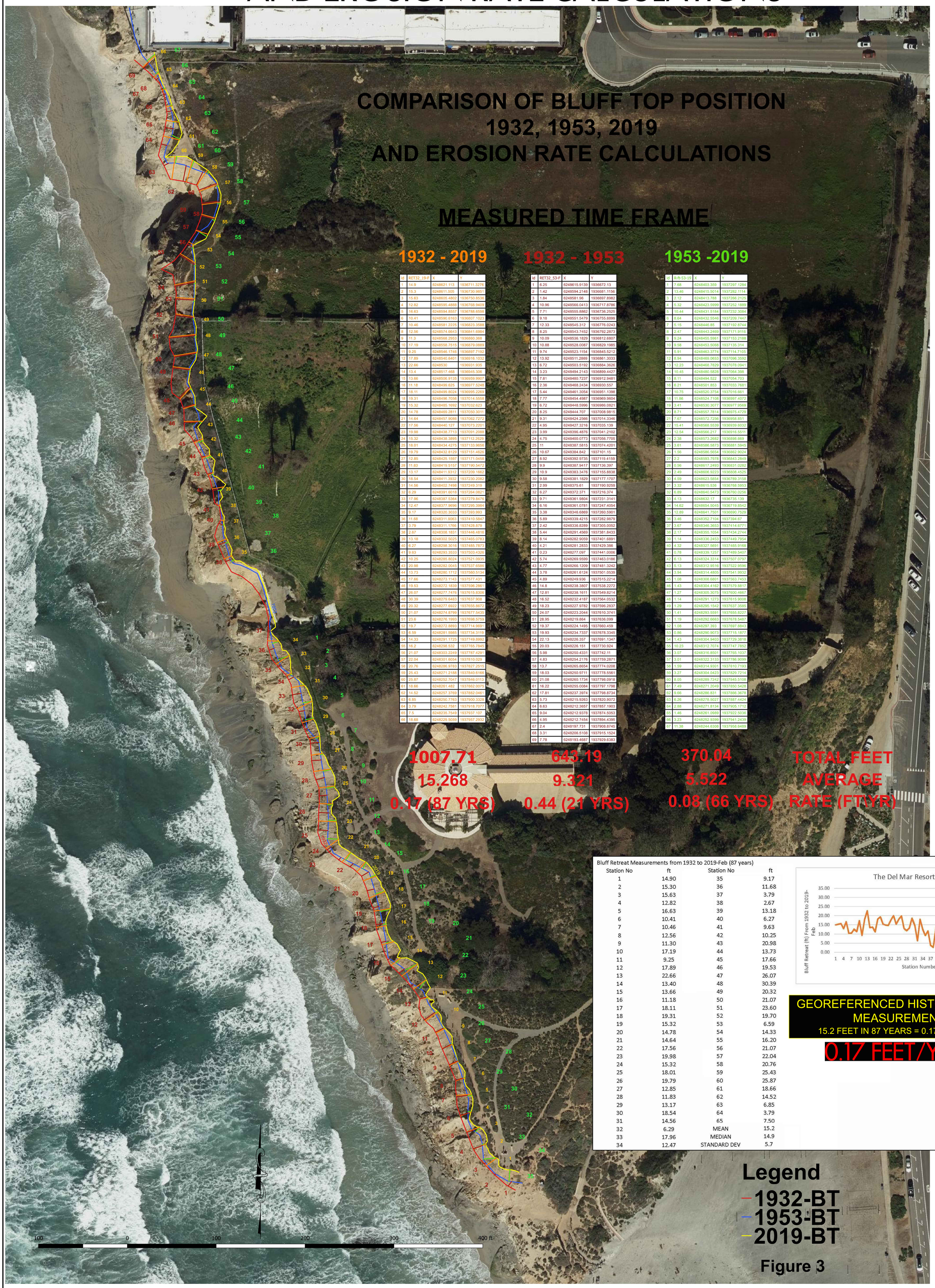
SCALE	NOT TO SCALE
DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04
FIGURE	24
SHEET	1 OF 1

Plotted:09/09/2019 10:15AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 2019-TopBluff-DeterminationRecentAerial.dwg

COMPARISON OF BLUFF TOP POSITION 1932, 1953, 2019 AND EROSION RATE CALCULATIONS



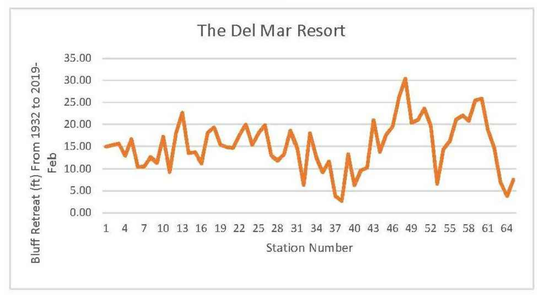
Id	RET32_19-F	X	Y
1	14.9	6248621.113	1936711.3276
2	15.3	6248611.505	1936730.9851
3	15.63	6248605.4802	1936750.8536
4	12.82	6248595.4888	1936768.9409
5	16.63	6248594.8557	1936788.6598
6	10.41	6248590.6163	1936807.1023
7	10.46	6248581.2225	1936823.3588
8	12.56	6248574.6643	1936841.6984
9	11.3	6248568.2953	1936860.368
10	17.19	6248558.7515	1936879.0889
11	9.25	6248546.1746	1936897.7192
12	17.89	6248540.6401	1936916.1032
13	22.66	6248530	1936931.935
14	13.4	6248517.468	1936945.306
15	13.66	6248506.9135	1936959.9907
16	11.18	6248499.625	1936977.5248
17	18.11	6248499.8024	1936995.2269
18	19.31	6248496.7056	1937014.5558
19	15.32	6248485.1692	1937032.623
20	14.78	6248469.2811	1937050.3011
21	14.64	6248457.9086	1937062.7272
22	17.56	6248440.127	1937073.2201
23	19.98	6248438.7713	1937091.2088
24	15.32	6248438.3895	1937112.2629
25	18.01	6248434.4275	1937133.9656
26	19.79	6248432.8129	1937151.4626
27	12.85	6248425.1597	1937171.0458
28	11.83	6248419.5157	1937190.5472
29	13.17	6248411.9312	1937209.1662
30	18.54	6248411.3932	1937230.2082
31	14.56	6248402.7498	1937249.319
32	6.29	6248391.6018	1937264.0821
33	17.96	6248387.5364	1937279.8476
34	12.47	6248377.9696	1937295.3984
35	9.17	6248320.3033	1937393.993
36	11.68	6248311.9063	1937410.5847
37	3.79	6248311.1766	1937428.879
38	2.67	6248308.1831	1937446.4816
39	13.18	6248302.5025	1937465.0783
40	6.27	6248298.3018	1937485.7873
41	9.63	6248293.3533	1937503.4326
42	10.25	6248285.8024	1937521.0935
43	20.98	6248282.0045	1937537.6586
44	13.73	6248280.1712	1937560.5134
45	17.66	6248273.1143	1937577.431
46	19.53	6248272.1839	1937598.2861
47	26.07	6248277.7476	1937615.8306
48	30.39	6248279.6483	1937637.908
49	20.32	6248277.6922	1937655.8672
50	21.07	6248274.8799	1937677.5435
51	23.6	6248276.1993	1937698.5759
52	19.7	6248272.8893	1937714.9691
53	6.59	6248281.5985	1937734.3119
54	14.33	6248291.1725	1937749.8992
55	16.2	6248298.532	1937785.7845
56	21.07	6248303.2249	1937787.4291
57	22.04	6248301.6054	1937810.029
58	20.76	6248286.9783	1937827.2515
59	25.43	6248271.2188	1937840.6166
60	25.87	6248252.7047	1937846.0113
61	18.66	6248261.482	1937862.0075
62	14.52	6248257.3769	1937882.0461
63	6.85	6248250.7763	1937900.3328
64	3.79	6248242.7581	1937918.7077
65	7.5	6248235.7549	1937937.107
66	16.68	6248229.5059	1937957.2932

Id	RET32_53-F	X	Y
1	6.25	6248615.9139	1936672.13
2	1.42	6248594.2148	1936681.1156
3	1.84	6248581.96	1936697.8982
4	10.96	6248566.0413	1936717.8786
5	7.71	6248555.8862	1936736.2525
6	9.18	6248551.5479	1936755.8899
7	12.33	6248545.312	1936776.0243
8	8.25	6248543.7452	1936792.2873
9	10.09	6248536.1829	1936812.6807
10	10.88	6248528.0087	1936829.1985
11	9.74	6248523.1154	1936845.5212
12	13.92	6248511.2869	1936861.3033
13	6.72	6248503.5192	1936884.3626
14	3.23	6248494.2143	1936899.4427
15	7.81	6248480.7237	1936912.9481
16	2.36	6248468.2434	1936930.557
17	5.44	6248461.3054	1936951.1398
18	7.77	6248454.4987	1936969.9604
19	6.72	6248448.5996	1936986.0821
20	8.25	6248444.707	1937008.9815
21	9.31	6248424.2566	1937014.3346
22	4.95	6248427.3216	1937035.139
23	3.99	6248396.4876	1937041.2102
24	4.75	6248400.0773	1937056.7705
25	11	6248387.5815	1937074.4201
26	10.67	6248384.842	1937101.15
27	8.92	6248392.0735	1937119.4159
28	9.9	6248387.9417	1937136.397
29	10.9	6248383.3476	1937155.8838
30	9.58	6248381.1829	1937177.1707
31	2.99	6248375.61	1937190.9259
32	6.27	6248372.371	1937216.374
33	9.71	6248361.9804	1937231.3141
34	6.16	6248361.0781	1937247.4054
35	3.38	6248346.6869	1937260.5901
36	5.89	6248339.4215	1937282.9879
37	2.42	6248336.8289	1937305.0052
38	5.44	6248291.4569	1937381.8433
39	8.14	6248282.9059	1937401.6891
40	4.21	6248281.2833	1937429.386
41	0.23	6248277.097	1937441.0006
42	5.74	6248269.9599	1937463.0186
43	4.77	6248266.1209	1937481.3242
44	3.78	6248261.6124	1937501.0539
45	4.89	6248249.936	1937515.2214
46	14.8	6248238.3807	1937538.2272
47	12.81	6248238.1611	1937549.8214
48	16.52	6248232.4187	1937564.0532
49	18.23	6248227.9782	1937596.2837
50	24.07	6248223.2044	1937610.3741
51	28.95	6248219.864	1937636.099
52	19.37	6248224.1495	1937660.459
53	19.93	6248234.7337	1937678.3345
54	22.13	6248226.357	1937691.1347
55	20.03	6248226.151	1937730.924
56	5.98	6248250.4331	1937742.11
57	4.83	6248254.2176	1937759.2871
58	13.7	6248265.8654	1937774.0208
59	18.03	6248250.9711	1937778.5561
60	21.08	6248260.1734	1937798.0918
61	16.22	6248255.0084	1937797.1798
62	17.81	6248237.3974	1937798.8734
63	5.73	6248215.9263	1937820.9072
64	6.63	6248212.3657	1937857.1903
65	9.04	6248212.9378	1937874.5053
66	4.95	6248212.7454	1937894.4395
67	2.4	6248197.731	1937908.8745
68	3.31	6248206.5108	1937915.1524
69	7.78	6248193.4687	1937929.6383

Id	R-ft-53-19	X	Y
1	7.68	6248403.359	1937297.1284
2	13.46	6248415.5014	1937282.1114
3	2.12	6248413.788	1937266.2125
4	5.32	6248423.5999	1937252.1889
5	10.44	6248431.5184	1937232.3084
6	8.64	6248432.5546	1937209.7447
7	5.15	6248446.85	1937192.8744
8	2.47	6248443.2469	1937171.9116
9	9.24	6248455.5961	1937153.2188
10	9.58	6248453.5068	1937135.314
11	5.91	6248463.3774	1937114.7105
12	8.94	6248469.0653	1937096.3592
13	12.23	6248468.7829	1937078.0941
14	10.45	6248480.5828	1937064.398
15	8.11	6248494.522	1937054.703
16	6.21	6248501.853	1937033.7681
17	10.75	6248520.3754	1937016.661
18	11.86	6248524.7108	1936997.4072
19	3.41	6248530.3077	1936977.9569
20	8.71	6248557.7814	1936975.4729
21	7.67	6248572.7256	1936958.851
22	15.41	6248568.5539	1936939.6032
23	12.54	6248566.217	1936916.5511
24	2.38	6248573.2682	1936898.669
25	3.61	6248586.5873	1936881.5945
26	1.56	6248586.5654	1936862.9024
27	2.2	6248593.7978	1936843.2849
28	0.56	6248617.2493	1936831.0282
29	2.49	6248606.9223	1936808.4525
30	4.59	6248623.5854	1936789.3158
31	3.32	6248615.536	1936768.5953
32	6.89	6248640.5473	1936760.0256
33	4.13	6248632.17	1936735.139
34	14.62	6248654.5045	1936719.8542
35	12.89	6248641.7501	1936690.7529
36	3.46	6248352.7104	1937394.67
37	3.67	6248346.3653	1937414.6771
38	2.17	6248355.1054	1937434.2744
39	1.14	6248336.2453	1937449.7954
40	4.32	6248327.5691	1937465.9168
41	0.78	6248339.1257	1937489.5407
42	6.13	6248324.3314	1937507.0797
43	5.13	6248312.9516	1937522.9596
44	3.94	6248314.4805	1937541.9932
45	1.08	6248308.6801	1937563.7453
46	1.43	6248304.4162	1937579.8817
47	1.27	6248305.3075	1937600.4667
48	1.14	6248291.1273	1937615.9008
49	1.29	6248295.1542	1937637.3585
50	1.41	6248293.5591	1937655.8227
51	1.19	6248292.6663	1937678.5487
52	1.08	6248297.393	1937697.8843
53	0.86	6248290.9073	1937715.1877
54	1.43	6248304.9403	1937729.3816
55	10.23	6248312.7074	1937747.7852
56	3.07	6248316.8501	1937765.1037
57	3.01	6248322.3133	1937786.9099
58	1.59	6248314.9301	1937810.7193
59	3.27	6248304.0423	1937829.7214
60	8.05	6248289.7242	1937845.5108
61	7.49	6248271.2049	1937850.5428
62	9.66	6248286.831	1937866.3678
63	6.26	6248278.5027	1937887.4424
64	2.88	6248271.8134	1937905.1712
65	1.46	6248261.0989	1937922.5036
66	3.23	6248252.9399	1937941.2439
67	11.38	6248244.6308	1937958.6489

Bluff Retreat Measurements from 1932 to 2019-Feb (87 years)

Station No	ft	Station No	ft
1	14.90	35	9.17
2	15.30	36	11.68
3	15.63	37	3.79
4	12.82	38	2.67
5	16.63	39	13.18
6	10.41	40	6.27
7	10.46	41	9.63
8	12.56	42	10.25
9	11.30	43	20.98
10	17.19	44	13.73
11	9.25	45	17.66
12	17.89	46	19.53
13	22.66	47	26.07
14	13.40	48	30.39
15	13.66	49	20.32
16	11.18	50	21.07
17	18.11	51	23.60
18	19.31	52	19.70
19	15.32	53	6.59
20	14.78	54	14.33
21	14.64	55	16.20
22	17.56	56	21.07
23	19.98	57	22.04
24	15.32	58	20.76
25	18.01	59	25.43
26	19.79	60	25.87
27	12.85	61	18.66
28	11.83	62	14.52
29	13.17	63	6.85
30	18.54	64	3.79
31	14.56	65	7.50
32	6.29	MEAN	15.2
33	17.96	MEDIAN	14.9
34	12.47	STANDARD DEV	5.7



GEOREFERENCED HISTORIC PHOTO MEASUREMENTS

15.2 FEET IN 87 YEARS = 0.17 FEET/YEAR

0.17 FEET/YEAR

COMPARISON OF BLUFF TOP POSITION EXHIBIT

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SCALE	1" = 40'	DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04		FIGURE 25
SHEET	1 OF 1		

Plotted:09/09/2019 10:19AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 MeasuredTimeFrame-ComparisonBluffTopPosition.dwg

CONSIDERATION OF SEA LEVEL RISE AND ACCELERATED BLUFF RETREAT; MULTIPLIER AND SIMPLE EQUATION METHODS

1) **Multiply the calculated setback distance by 1.5** (previously accepted by California Coastal Commission)

Calculated Erosion Rate 0.17 Feet/Year x 75 Years = 12.75 Feet x 1.5 = 20 feet

2) **Simple Equation $R2 = R1\sqrt{(S2/S1)}$**

R2 = Future Rate of Bluff Retreat

R1 = Historical Rate of Bluff Retreat (0.17 Feet/Year)

S1 = Historical Rate of Sea Level Rise (0.007 Feet/Year From 1932 to 2019)

S2 = Future Rate of Sea Level Rise (17% Probability of Exceedance 0.055 Feet/Year)

(0.5% Probability of Exceedance 0.124 Feet/Year)

A) FUTURE BLUFF RETREAT (66% Probability of Occurence, 17% Probability of Exceedance, High Emissions)

$R2 = (0.17\ Feet/Year)\sqrt{(0.055\ Feet/Year/0.007\ Feet/Year)} = 0.48\ Feet/Year$

Average Future Bluff Retreat Rate Between 2019 and 2100

(**0.48 Feet/Year + 0.17 Feet/Year = 0.65 divided by 2 = 0.325 Feet/Year**)

Multiply by Project Life Span of 75 Years

Future Bluff Retreat (0.325 Feet/Year x 75 Years) = 24 Feet

B) FUTURE BLUFF RETREAT (0.5% Probability of Exceedance, High Emissions)

$R2 = (0.17\ Feet/Year)\sqrt{(0.124\ Feet/Year/0.007\ Feet/Year)} = 0.72\ Feet/Year$

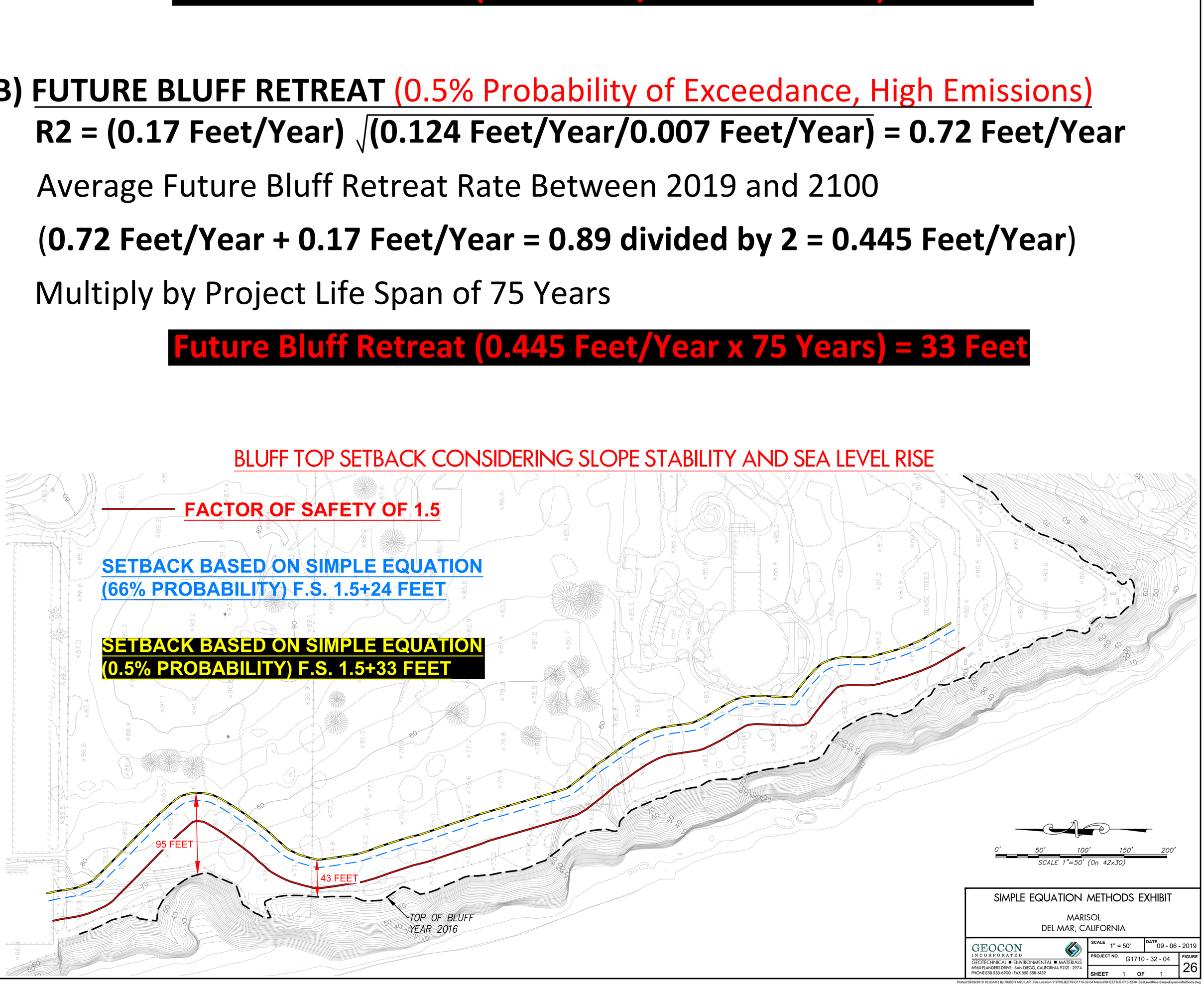
Average Future Bluff Retreat Rate Between 2019 and 2100

(**0.72 Feet/Year + 0.17 Feet/Year = 0.89 divided by 2 = 0.445 Feet/Year**)

Multiply by Project Life Span of 75 Years

Future Bluff Retreat (0.445 Feet/Year x 75 Years) = 33 Feet

BLUFF TOP SETBACK CONSIDERING SLOPE STABILITY AND SEA LEVEL RISE



SIMPLE EQUATION METHODS EXHIBIT

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SCALE 1" = 50'	DATE 09 - 06 - 2019
PROJECT NO. G1710 - 32 - 04	FIGURE 26
SHEET 1 OF 1	

Plotted:09/09/2019 10:20AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 SeaLevelRise-SimpleEquationMethods.dwg

RECOMMENDED SETBACK

RECOMMENDED SETBACK

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SCALE	1" = 40'	DATE	09 - 06 - 2019
PROJECT NO.	G1710 - 32 - 04	FIGURE	27
SHEET	1 OF 1		

Plotted:09/09/2019 10:20AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 RecommendedSetback.dwg

SURFACE RUNOFF OVERTOPPING THE BLUFF IS A SIGNIFICANT CONTRIBUTOR TO THE RATE OF RETREAT/EROSION OF THE BLUFF TOP

PRE-AND POST-DEVELOPMENT DRAINAGE AREAS FLOWING TOWARDS COASTAL BLUFFS

SUBAERIAL EROSION EXHIBIT

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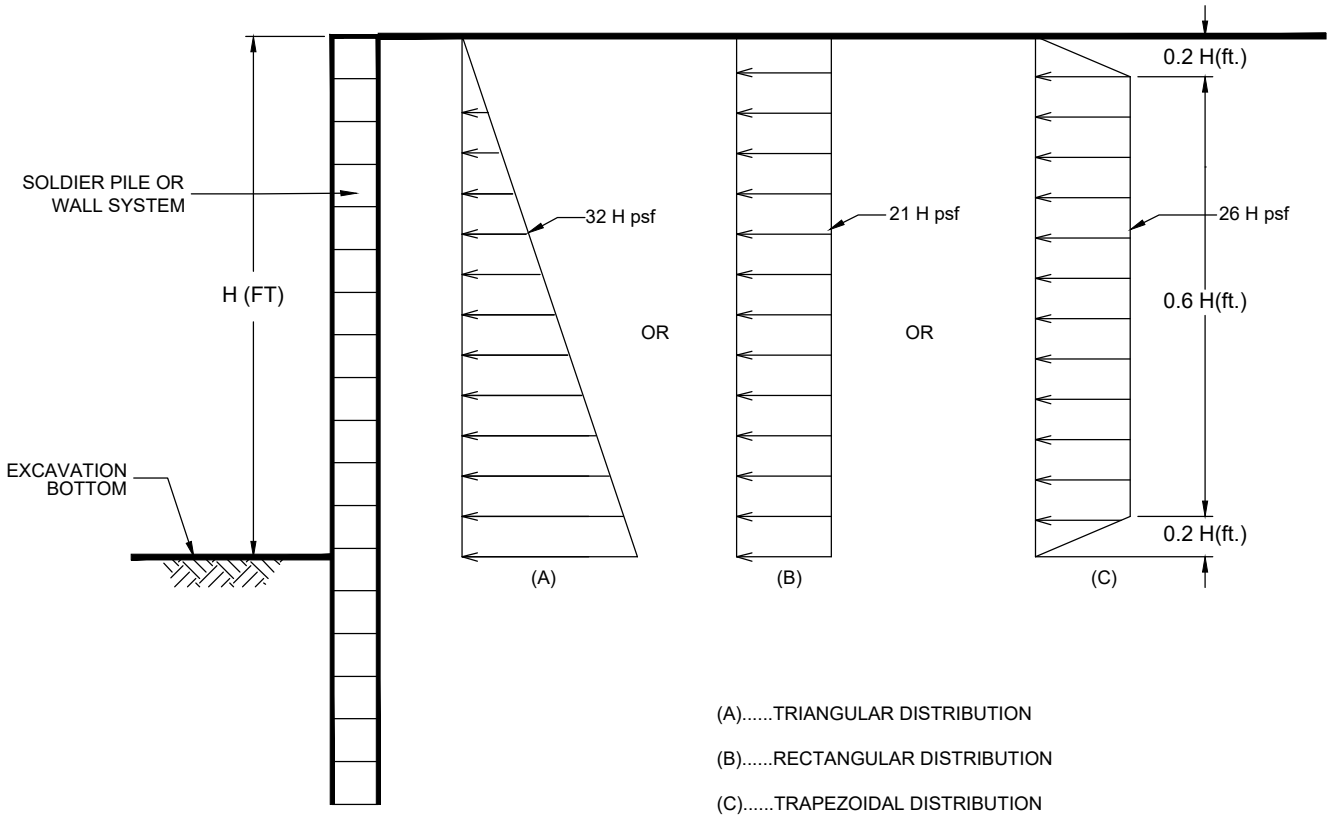
SCALE	DATE
NOT TO SCALE	09 - 06 - 2019
PROJECT NO. G1710 - 32 - 04	FIGURE 28
SHEET 1 OF 1	

Plotted:09/09/2019 10:20AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\SHEETS\G1710-32-04 SubaerialErosionExhibit.dwg



(A).....TRIANGULAR DISTRIBUTION

(B).....RECTANGULAR DISTRIBUTION

(C).....TRAPEZOIDAL DISTRIBUTION

NO SCALE

LATERAL ACTIVE PRESSURES FOR TEMPORARY SHORING

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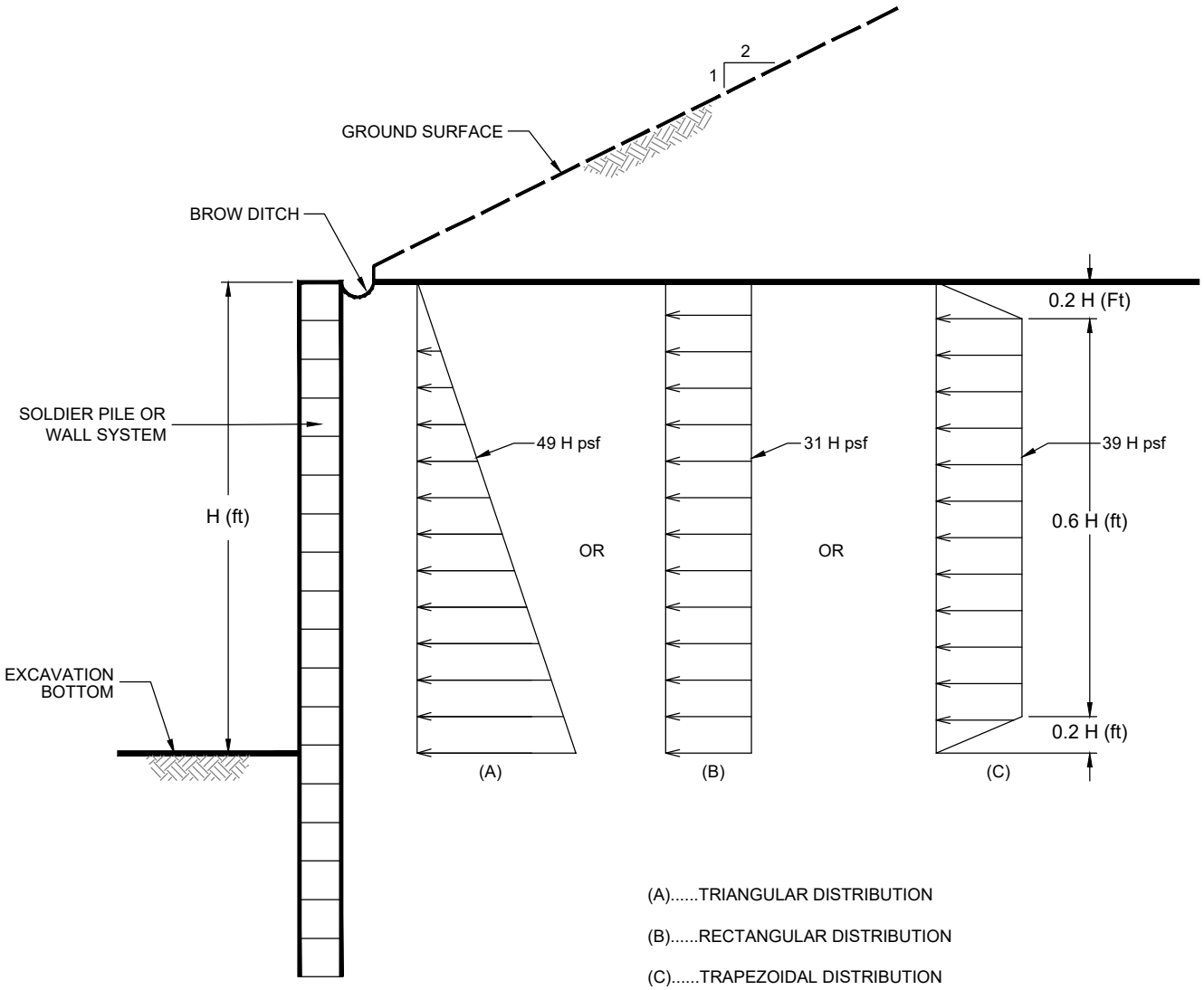
DE / RA		DSK/GTYPD

DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. 29

Plotted:09/09/2019 10:20AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\DETAILS\Lateral Active Pressures For Vertical Excavations (LAPFVE10).dwg



(A).....TRIANGULAR DISTRIBUTION

(B).....RECTANGULAR DISTRIBUTION

(C).....TRAPEZOIDAL DISTRIBUTION

NO SCALE

LATERAL ACTIVE PRESSURES FOR TEMPORARY SHORING - SLOPING GROUND SURFACE

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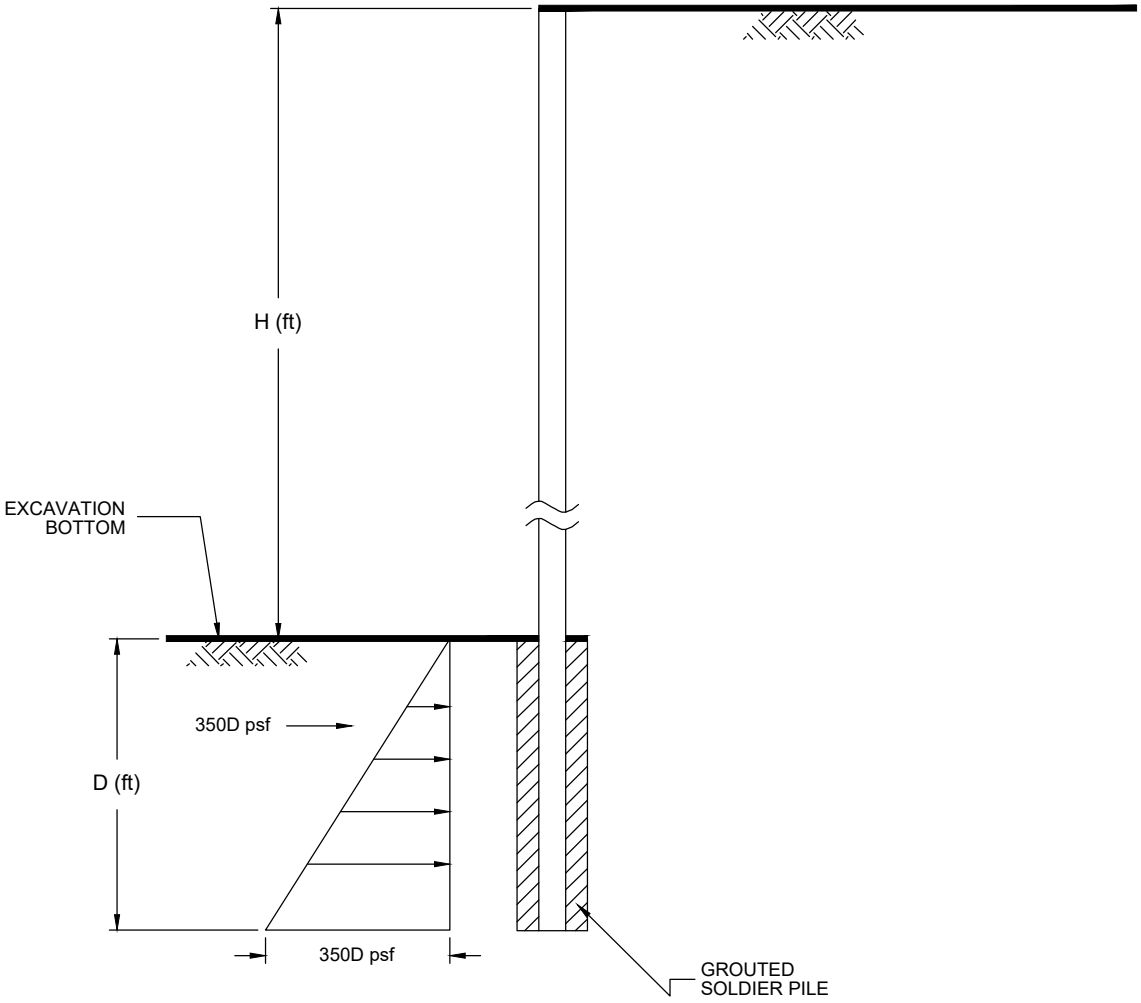
DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. 30

Plotted:09/09/2019 10:20AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\DETAILS\Active Pressures For Temporary Shoring (APTS-2).dwg



NO SCALE

SOLDIER PILE PASSIVE PRESSURE DISTRIBUTION

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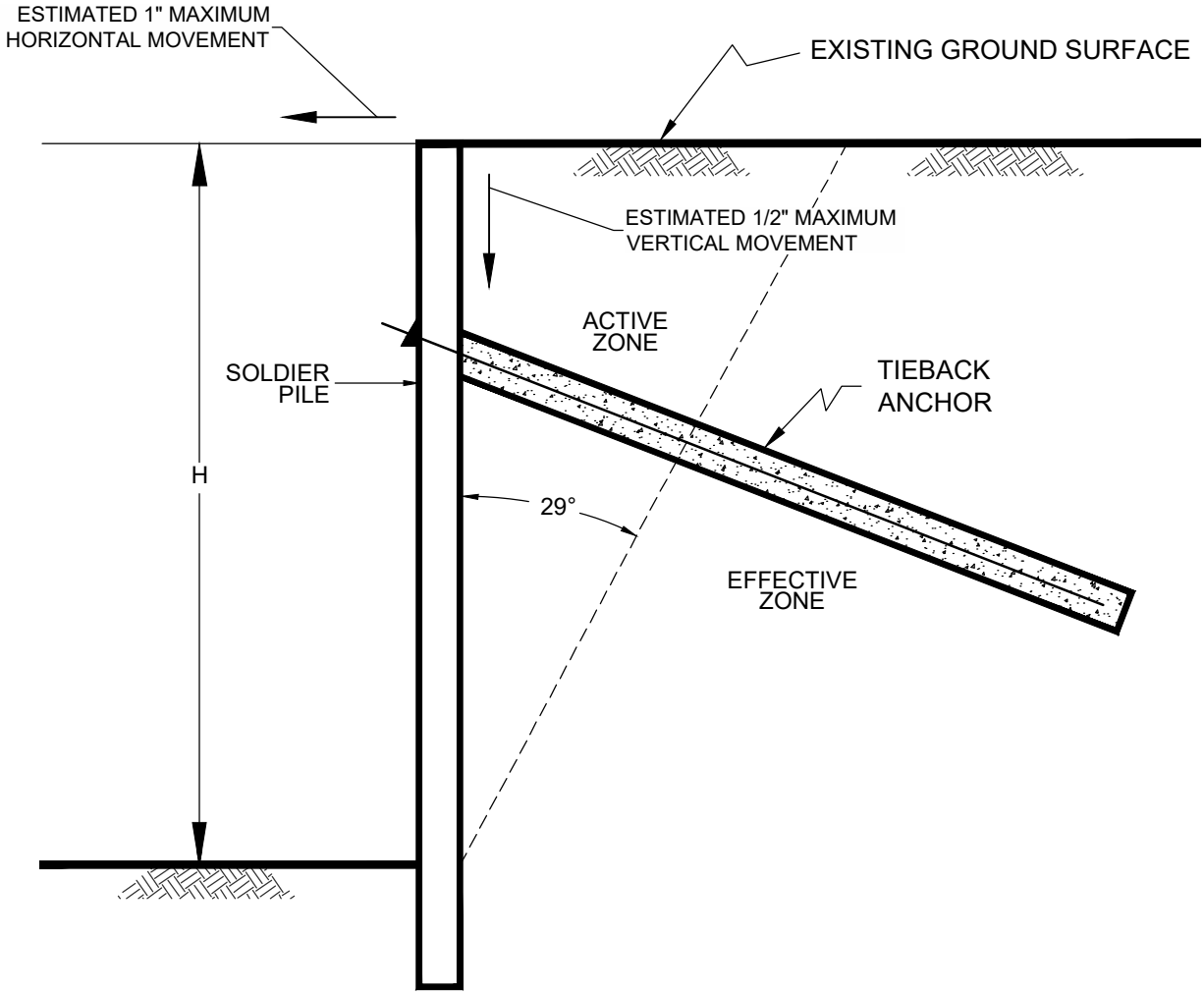
DE / RA		DSK/GTYPD

DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. 31

Plotted:09/09/2019 10:21AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\DETAILS\Grouted Soldier Pile Passive Pressure (RGSPPD6).dwg



NOTE: NO ESTIMATED MOVEMENT AT EFFECTIVE ZONE

NO SCALE

RECOMMENDED EFFECTIVE ZONE FOR TIEBACK ANCHORS

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MARISOL
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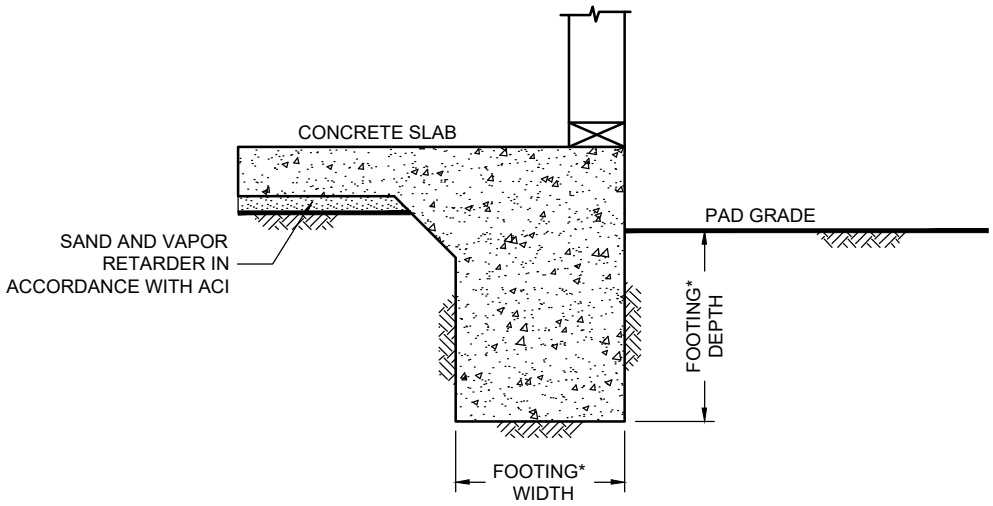
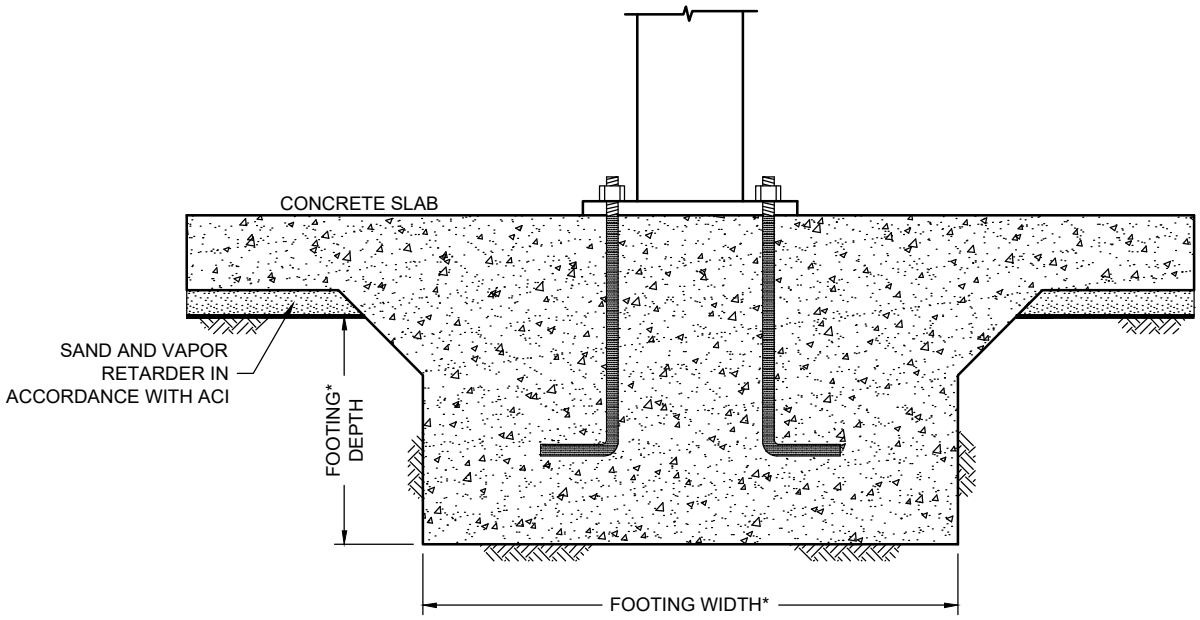
DE / RA		DSK/GTYPD

DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. 32

Plotted:09/09/2019 10:21AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\DETAILS\Effective Zone For Tieback Anchors (REZTA6).dwg





*....SEE REPORT FOR FOUNDATION WIDTH AND DEPTH RECOMMENDATION

NO SCALE

WALL / COLUMN FOOTING DIMENSION DETAIL

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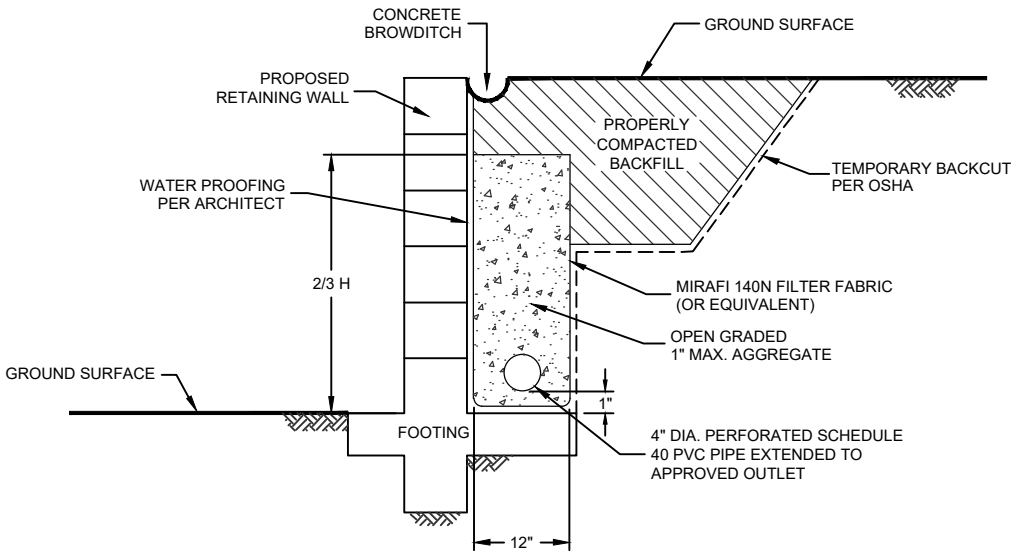
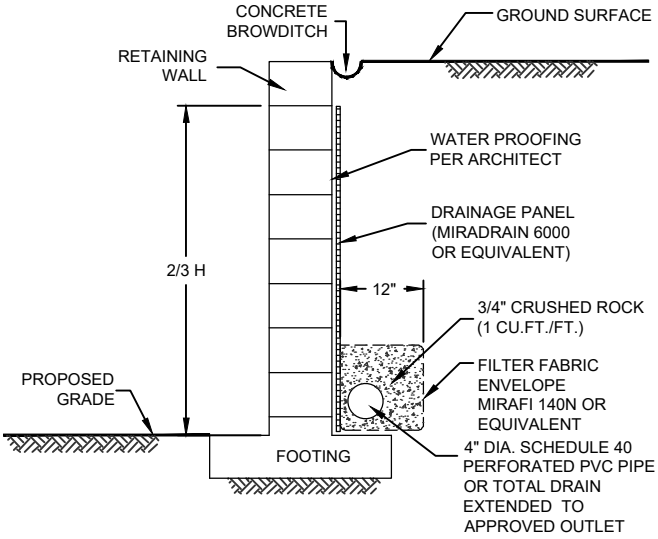
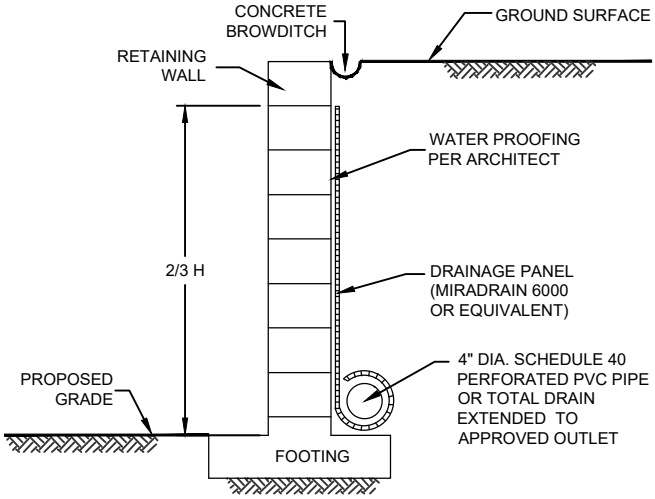
DE / RA		DSK/GTYPD

DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. 33

Plotted:09/09/2019 10:21AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\DETAILS\Wall-Column Footing Dimension Detail (COLFOOT2).dwg







NOTE :

DRAIN SHOULD BE UNIFORMLY SLOPED TO GRAVITY OUTLET OR TO A SUMP WHERE WATER CAN BE REMOVED BY PUMPING

NO SCALE

TYPICAL RETAINING WALL DRAIN DETAIL

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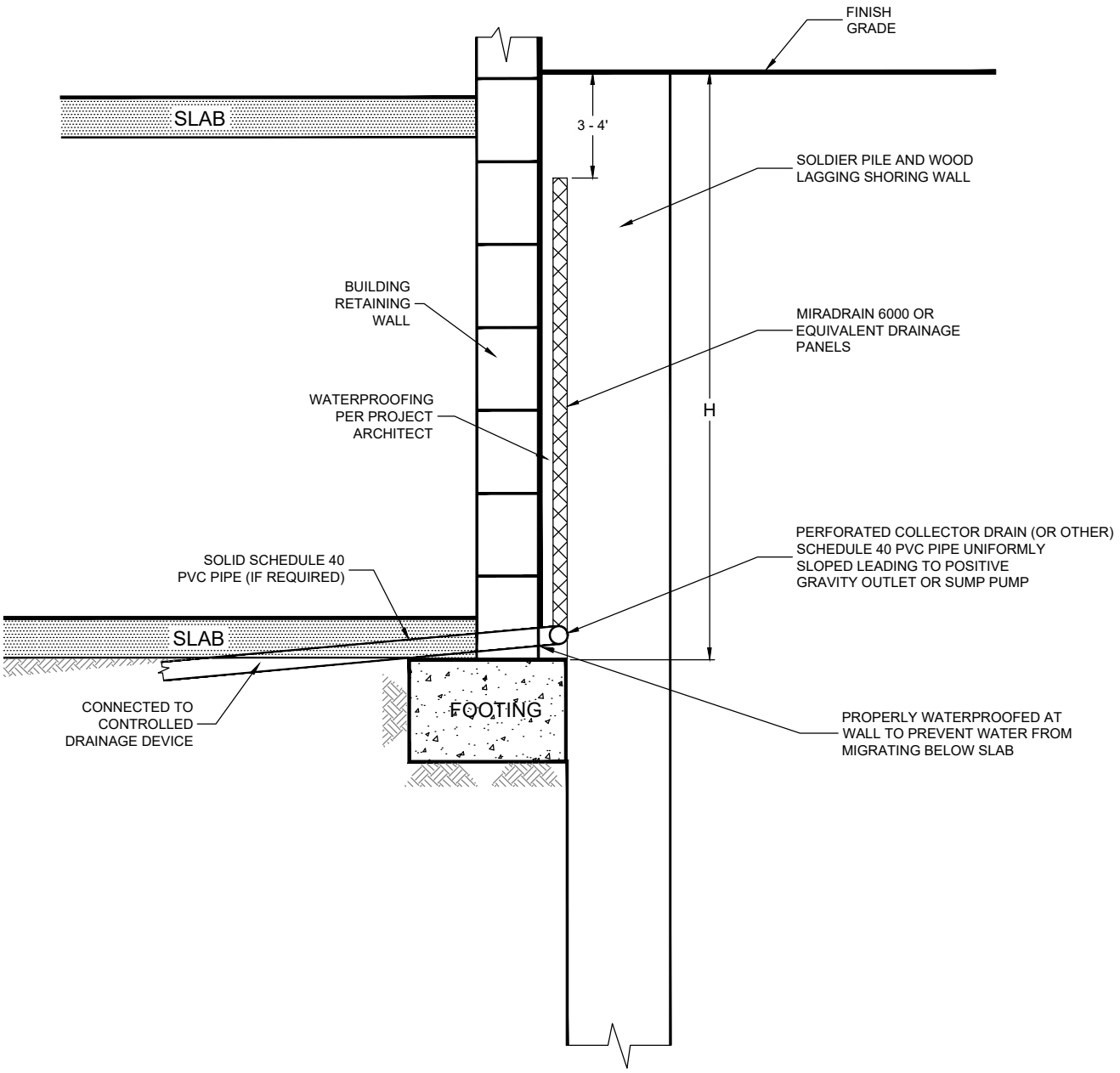
DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. 34

Plotted:09/09/2019 10:21AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\DETAILS\Typical Retaining Wall Drainage Detail (RWDD7A).dwg



NO SCALE

SOLDIER PILE WALL DRAINAGE DETAIL

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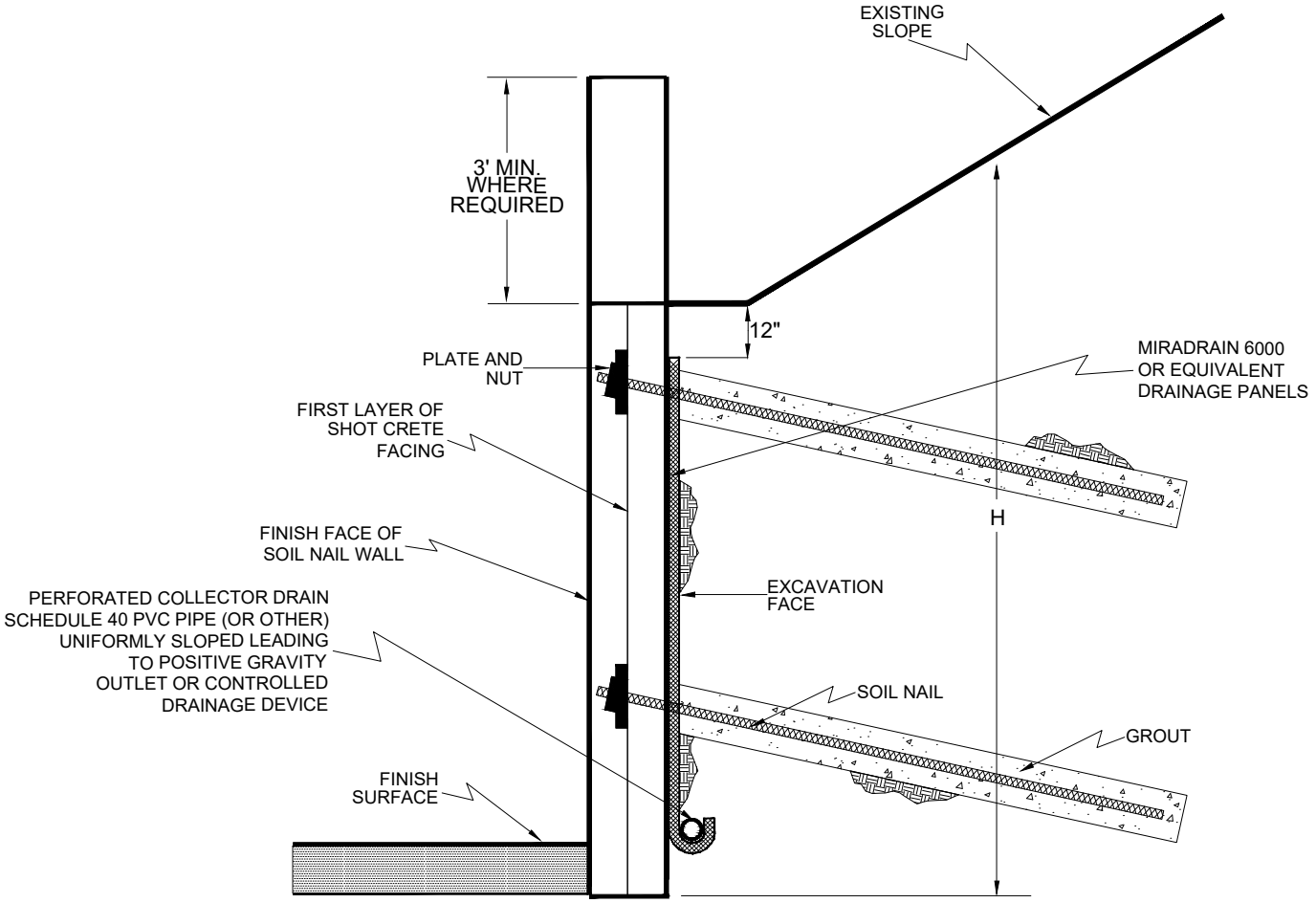
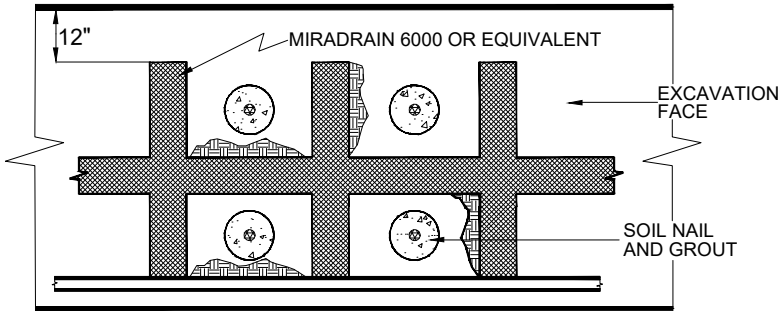
DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. 35

Plotted:09/09/2019 10:21AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\DETAILS\Soldier Pile Wall Drainage Detail (SPWDD3).dwg



NO SCALE



DRAINAGE PANELS PER SOIL NAIL WALL ENGINEER

NO SCALE

SOIL NAIL WALL DRAINAGE DETAIL

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DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. 36

Plotted:09/09/2019 10:21AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\DETAILS\Soil Nail Wall Drainage Detail (SNWDD).dwg

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

The previous and recent field investigations were performed between March 8 and 10, 2016, and July 18 and August 4, 2017, respectively, and consisted of a site reconnaissance, and the excavation of three large-diameter borings, eleven small-diameter borings, five limited access, small-diameter borings, two continuous core borings, and twenty-two exploratory trenches. The approximate locations of the exploratory borings and trenches are shown on the *Geologic Map*, **Figure 3**.

The three large-diameter borings (LB-1 through LB-3) were performed by Dave's Drilling and advanced to a maximum depth of 99 feet using an EasyBore 120 truck-mounted drill rig equipped with a 30-inch-diameter bucket auger. Relatively undisturbed samples were obtained by driving a California split-spoon (CAL) sampler into the "undisturbed" soil mass with the drill rig kelly bar. Bulk samples were also obtained. The logs of the large diameter borings are presented on **Figures A-1 through A-3**.

The small-diameter borings (SB-1 through SB-11), performed by Baja Exploration, were advanced to a maximum depth of 100½ feet using a CME-95 drill rig equipped with 8-inch, hollow-stem augers. Relatively undisturbed samples were obtained by driving either a California split-spoon (CAL) or a Standard Penetration Test (SPT), split-tube sampler into the "undisturbed" soil mass. Bulk samples were also obtained. Logs of the small-diameter borings are presented on **Figures A-4 through A-14.**

The five, limited access, small-diameter borings (LA-1 through LA-5) were performed by Pacific Drilling and advanced to a maximum depth of 85½ feet using a Fraste PL-G track-mounted drill rig equipped with 6-inch augers. Relatively undisturbed samples were obtained by driving either a California split-spoon (CAL) or a Standard Penetration Test (SPT), split-tube sampler into the "undisturbed" soil mass. Bulk samples were also obtained. Logs of the limited access borings are presented **on Figures A-15 through A-19.**

The two continuous core borings (CC-1 and CC-2) were performed by BC2 Environmental to a maximum depth of 100 feet using a CME-75 drill rig equipped with 8-inch augers. A 4-inch diameter core sampler was utilized to recover 5-foot intervals during drilling operations. A 2-inch diameter sampler was utilized below 80 feet in Boring No. CC-2 due to seepage conditions. The recovered core samples were placed in cardboard wax boxes for transport. Logs of the continuous core borings are presented on **Figures A-20 and A-21.**

The twenty-two backhoe trenches (T-1 through T-22) were advanced by Hillside Excavating to depths of 5 to 12 feet using a John Deere 410 rubber-tire backhoe equipped with a 24-inch-wide bucket. Bulk samples were also collected. Logs of the backhoe trenches depicting the soil and geologic conditions encountered are presented on **Figures A-22 through A-43.**

The soils encountered in the excavations were visually classified and logged in general accordance with American Society for Testing and Materials (ASTM) practice for Description and Identification of Soils (Visual Manual Procedure D 2488).

PROJECT NO. G1710-32-04

BORING LB 1

ELEV. (MSL.) **80.5'** DATE COMPLETED **03-08-2016**

EQUIPMENT **30" Bucket Auger** BY: **D. EVANS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, moist, medium brown, Silty, fine SAND; abundant roots to 4 feet, 1/2-inch to 1-inch diameter			
4				SM/SP	-Gradational contact **OLD PARALIC DEPOSITS** Medium dense to dense, orange-brown, Silty, fine SAND; massive, near horizontal bands of reddish brown, clayey sand (translocated clays) -Becomes dense to very dense and slightly cemented at 6 feet			
6	B1-1					3		
10	B1-2				-Light grey mottling at 10 feet with continued thin banding/webbing of reddish brown, clayey sand -Well cemented from 11 feet to 17 feet	5	107.4	6.8
16	B1-3					5	103.3	3.6
					-Significant decrease in cementation and cohesion at 17 feet			
20	B1-4					6	105.7	4.6
24					-Heavy caving and belling from 24 to 30 feet, 5 foot diameter bell; unable to drill below 30 feet, down hole logged to 24 feet			
26	B1-5					5	100.9	3.6
30	B1-6					5	95.8	3.6
					BORING TERMINATED AT 31 FEET			

Figure A-1,
Log of Boring LB 1, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

BORING LB 2

ELEV. (MSL.) **74'** DATE COMPLETED **03-08-2016**

EQUIPMENT **30" Bucket Auger** BY: **D. EVANS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, damp, medium brown, Silty, fine SAND; roots			
2					-Gradational contact			
4				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange-brown, Silty, fine SAND; massive, near horizontal; irregular shaped bands of reddish-brown, clayey sand (translocated clays)			
6	B2-1					3	105.1	4.3
8					-Becomes dense to very dense and slightly cemented at 8 feet			
10	B2-2				-No recovery on sample	3		
12					-Light grey mottling at 12 feet			
14								
16	B2-3				-Significant decrease in cementation and cohesion at 16 feet	4	105.6	3.8
18								
20	B2-4					4	101.9	4.6
22								
24								
26	B2-5					4	103.0	4.3
28								
30	B2-6				-Difficult drilling due to caving from 30 to 40 feet	6	99.2	3.0
32					-Moderate caving and belling at 33 feet			
34								

Figure A-2,
Log of Boring LB 2, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING LB 2

ELEV. (MSL.) **74'** DATE COMPLETED **03-08-2016**

EQUIPMENT **30" Bucket Auger** BY: **D. EVANS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	B2-7			SM/SP		6	99.8	2.8
38					-Heavy caving and belling from 39 to 47 feet, 5 foot diameter bell; down hole logged to 39 feet			
40	B2-8					8	103.9	4.5
42					-Basal gravel/cobble lens below 42 feet; contact observed and measured from 39 feet			
44				SM	**TORREY SANDSTONE** Dense, damp, tan, Silty, fine to medium SANDSTONE; orange oxide staining, moderately to highly cemented			
46	B2-9					12		
48								
50	B2-10					15	105.1	6.6
52								
54								
56	B2-11					15/10"		
58				SM	**DEL MAR FORMATION** Very dense, damp, yellowish brown, Silty, fine to medium SANDSTONE; mottled with bluish-green blebs and orange oxide; slightly cemented			
60	B2-12					15/10"	105.7	5.9
62								
64								
66	B2-13					15/8"		
68								

G1710-32-04.GPJ

Figure A-2,
Log of Boring LB 2, Page 2 of 3

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING LB 2

ELEV. (MSL.) **74'** DATE COMPLETED **03-08-2016**

EQUIPMENT **30" Bucket Auger** BY: **D. EVANS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	B2-14			SM		15/8"		
72								
74								
76	B2-15		▽		-Seepage at 76 feet	15/8"	113.0	15.4
78								
80	B2-16					25/8"		
82								
84								
86	B2-17				-Becomes dark gray at 85 feet	30/6"		
88								
90								
92								
94								
96	B2-18					35/6"		
					BORING TERMINATED AT 96 FEET			

Figure A-2,
Log of Boring LB 2, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING LB 3 ELEV. (MSL.) 78' DATE COMPLETED 03-09-2016 EQUIPMENT 30" Bucket Auger BY: D. EVANS MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, moist, medium brown, Silty, fine SAND; rootlets			
2								
4					-Gradational contact			
				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, damp, orange-brown, Silty, fine SAND; massive, near horizontal bands of reddish brown, clayey sand (translocated clays)			
6								
8					-Becomes dense to very dense at 8 feet			
10					-Light grey mottling and slightly cemented at 10 feet			
12								
14								
16								
18								
20					-Significant decrease in cementation and cohesion at 19 feet			
22								
24								
26					-Heavy caving and belling from 24 to 50 feet, 5-foot diameter bell; down hole logged to 24 feet			
28								
30	B3-1					6		
32								
34								

Figure A-3,
Log of Boring LB 3, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING LB 3

ELEV. (MSL.) **78'** DATE COMPLETED **03-09-2016**

EQUIPMENT **30" Bucket Auger** BY: **D. EVANS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	B3-2			SM		8	106.5	3.7
38								
40								
42	B3-3					7		
44					-Contact observed and measured from 24 feet			
46	B3-4			SM	**TORREY SANDSTONE** Dense to very dense, damp, tan, Silty, fine to medium SANDSTONE; moderately to highly cemented	10/8"		
48								
50	B3-5					7/8"	110.1	6.9
52								
54								
56	B3-6				-Sample disturbed	7/10"		
58								
60	B3-7					20/6"		
62								
64								
66	B3-8					15/7"	109.8	5.8
68								

Figure A-3,
Log of Boring LB 3, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

BORING LB 3

ELEV. (MSL.) **78'** DATE COMPLETED **03-09-2016**

EQUIPMENT **30" Bucket Auger** BY: **D. EVANS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	B3-9		▽	SM	-Seepage at 70 feet	20/6"		
72								
74				SM	-Contact based on drill rig efficiency **DEL MAR FORMATION** Very dense, moist, grayish green, Silty, fine to medium SANDSTONE			
76	B3-10					20/8"	120.3	12.3
78								
80	B3-11					30/6"		
82								
84								
86	B3-12					30/8"		
88								
90	B3-13				-Becomes yellowish brown at 90 feet	30/7"		
92								
94					-Becomes interbedded with dark grey siltstone at 94 feet			
96	B3-14		▽		-Standing water in the bottom of boring	30/7"		
98								
					BORING TERMINATED AT 99 FEET			

Figure A-3,
Log of Boring LB 3, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

BORING SB 1

ELEV. (MSL.) **68'** DATE COMPLETED **07/24/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2	SB1-1			SM	**TOPSOIL** Loose, dry to damp, brown to reddish brown, Silty, fine SAND			
4				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
6	SB1-2				-Becomes brown below 5 feet	21 11	119.3	6.6
8								
10	SB1-3				-Becomes grayish brown with orange oxidation	28 23	112.7	4.5
12								
14								
16	SB1-4				-Becomes light brown below 15 feet	62 34	109.2	5.9
18								
20	SB1-5				-Becomes light brown with orange mottling below 20 feet	62 26	101.6	2.4
22								
24								
26	SB1-6				-Becomes fine to coarse with trace gravel from 25 to 25.5 feet	~~87/9"~~		
				SM	**TORREY SANDSTONE (Tt)** Dense to very dense, damp, light brown with orange mottling, Silty, fine to medium SANDSTONE	82		
28								
30					-No recovery	75/6"		
32								
34								

Figure A-4,
Log of Boring SB 1, Page 1 of 2

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING SB 1

ELEV. (MSL.) **68'** DATE COMPLETED **07/24/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	SB1-7			SM		140/6"	103.7	4.7
38								
40	SB1-8				-Becomes very light brown to white below 40 feet	95/6"		
42								
44								
46	SB1-9				-Orange mottling present below 45 feet	55/6"	107.7	5.8
48								
50	SB1-10					140/6"		
52								
54								
56	SB1-11					105/6"	103.3	4.3
58								
60	SB1-12					80/6"		
62								
64					-Cuttings bound up auger; water added but ended up shearing 30-feet of auger off			
					BORING TERMINATED AT 64 FEET			

Figure A-4,
Log of Boring SB 1, Page 2 of 2

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING SB 2

ELEV. (MSL.) **89'** DATE COMPLETED **07/25/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2	SB2-1			SM	**TOPSOIL** Loose, dry to damp, brown to reddish brown, Silty, fine SAND			
4				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
6	SB2-2				-Becomes brown below 5 feet	40 26	114.9	5.4
8								
10	SB2-3				-Becomes grayish brown with orange oxidation and fine to medium grained below 10 feet	44 24	108.7	4.9
12								
14								
16	SB2-4				-Becomes brown and fine grained below 15 feet	40 24	113.4	4.9
18								
20	SB2-5				-Becomes fine to medium grained below 20 feet	42 24	105.9	3.5
22								
24								
26	SB2-6					54 26	106.9	2.2
28								
30	SB2-7				-Becomes dense and very light brown and gray below 30 feet	62 35	105.1	2.1
32								
34								

Figure A-5,
Log of Boring SB 2, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 2

ELEV. (MSL.) **89'** DATE COMPLETED **07/25/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	SB2-8			SM		52 40	102.4	2.4
38								
40	SB2-9					44 33	106.2	4.0
42								
44								
46	SB2-10					83 50	105.0	2.4
48								
50	SB2-11				-Becomes white and fine to coarse grained below 50 feet	99 49	105.2	2.1
52								
54								
56	SB2-12					88	102.7	3.4
					-Sharp contact observed in sample between white sand and orange sandstone	101		
58				SM	**TORREY SANDSTONE (Tt)** Dense to very dense, damp, orange brown, Silty, fine to medium SANDSTONE			
60	SB2-13				-Becomes white with orange oxidation and some coarse grains present at 60 feet *Water added below 60 feet to prevent "sand lock" of augers	66/6"	106.1	2.8
62								
64								
66	SB2-14				-Becomes white at 65 feet	83/6"		
68								

G1710-32-04.GPJ

Figure A-5,
Log of Boring SB 2, Page 2 of 3

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 2

ELEV. (MSL.) **89'** DATE COMPLETED **07/25/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	SB2-15			SM		82/6"		
72								
74								
76	SB2-16				-Becomes moist and light brown with orange mottling below 75 feet	140/4"	109.9	12.8
78								
80	SB2-17				-Becomes light brown at 80 feet	70/6"		
82								
84								
86					-No recovery	75/6"		
88								
90	SB2-18				-Becomes wet below 90 feet	150/9"	109.3	19.2
92								
94								
96	SB2-19			SM	-Becomes orange brown and fine to coarse grained below 95 feet; sharp contact observed in sample	174		
98					**DEL MAR FORMATION (Td)** Very dense, moist, very pale grayish green, Silty, fine to medium SANDSTONE			
100	SB2-20					220/8"	113.3	16.2
					BORING TERMINATED AT 100.5 FEET			

Figure A-5,
Log of Boring SB 2, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 3

ELEV. (MSL.) **86.5'** DATE COMPLETED **07-25-2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, dry to damp, brown, Silty, fine SAND			
2								
4				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
6	SB3-1					28 30		
8								
10	SB3-2				-Becomes light brown below 10 feet	58 29	115.7	7.0
12								
14								
16	SB3-3				-Becomes dark brown and orange below 15 feet	37 24	112.4	5.9
18								
20	SB3-4				-Becomes light brown to white below 20 feet	38 22	99.7	1.3
22								
24								
26	SB3-5				-Becomes fine to medium grained below 25 feet	42 29	97.7	1.4
28								
30	SB3-6				-Becomes dense below 30 feet	74 70	110.3	1.6
32								
34								

Figure A-6,
Log of Boring SB 3, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 3

ELEV. (MSL.) **86.5'** DATE COMPLETED **07-25-2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	SB3-7			SM		89/9" 42	109.5	2.2
38								
40	SB3-8					74 46	104.9	2.8
42								
44								
46	SB3-9				-Becomes fine to coarse grained below 45 feet -Becomes white with orange mottling below 46 feet	71 58	103.8	1.5
48								
50	SB3-10					88 51	102.9	2.1
52								
54								
56	SB3-11					114/8"	102.2	3.8
				SM	**TORREY SANDSTONE (Tt)** Very dense, damp, orange brown, Silty, fine to medium SANDSTONE	56/6"		
58								
60	SB3-12					130/6"	104.5	5.3
62								
64								
66	SB3-13				-Becomes white with orange oxidation below 65 feet	116/6"		
68								

Figure A-6,
Log of Boring SB 3, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 3

ELEV. (MSL.) **86.5'** DATE COMPLETED **07-25-2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	SB3-14			SM	-Water added below 70 feet	117	113.8	4.7
72								
74								
76	SB3-15					80/6"		
78								
80					-No recovery at 80 feet	162/6"		
82								
84								
86	SB3-16				-Becomes wet and white to light brown below 85 feet	87/6"	107.7	19.2
88								
90	SB3-17			SM	-Becomes orange-brown below 90 feet	180/5"		
92								
94								
96	SB3-18				-Becomes pale brown below 95 feet	150/6"	110.7	18.3
98								
100	SB3-19			SM	**DEL MAR FORMATION (Td)** Very dense, moist, pale green with orange mottling, Silty, fine to medium SANDSTONE	108/6"	119.5	13.4
					BORING TERMINATED AT 100.5 FEET			

Figure A-6,
Log of Boring SB 3, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING SB 4

ELEV. (MSL.) **87.5'** DATE COMPLETED **07/26/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, damp, brown, Silty, fine SAND			
2								
4				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
6					-No recovery at 5 feet	18 24		
8								
10	SB4-1				-Becomes reddish brown and black below 10 feet	29 18	107.6	6.5
12								
14								
16	SB4-2				-Becomes light brown and black and fine to medium grained below 15 feet	29 21	100.6	3.2
18								
20	SB4-3				-Becomes reddish brown below 20 feet	39 21	113.6	4.6
22								
24								
26	SB4-4				-Becomes dense below 25 feet	51 31	107.9	3.1
28								
30	SB4-5				-Becomes light brown with orange oxidation and fine to coarse at 30 feet	65 40	111.4	1.7
32								
34								

Figure A-7,
Log of Boring SB 4, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING SB 4

ELEV. (MSL.) **87.5'** DATE COMPLETED **07/26/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	SB4-6			SM	-Becomes brown with orange oxidation below 35 feet	62 33	107.4	3.4
38								
40	SB4-7				-Becomes light brown with orange oxidation below 40 feet	64 39	106.7	2.6
42								
44								
46	SB4-8				-Becomes light brown with some orange oxidation and black sand	66 55	100.4	2.4
48								
50	SB4-9					93 70	103.6	2.8
52								
54								
56	SB4-10					64/6"	105.8	3.9
					-Drill rig chatter below 56.5 feet; contact estimated based on basal gravels	91/10"		
58				SM	**TORREY SANDSTONE (Tt)** Dense, to very dense, damp, orange brown, Silty, fine to medium SANDSTONE			
60	SB4-11					77/6"	102.3	3.9
62								
64					-Water added below 64 feet			
66	SB4-12				-Becomes light brown below 65 feet	80/6"		
68								

Figure A-7,
Log of Boring SB 4, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING SB 4

ELEV. (MSL.) **87.5'** DATE COMPLETED **07/26/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	SB4-13			SM	-Some orange mottling present below 70 feet	68/6"	101.8	4.4
72								
74								
76	SB4-14					110/6"		
78								
80	SB4-15				-Becomes damp to moist and fine to coarse grained at 80 feet	110/5"	98.5	9.0
82								
84								
86	SB4-16					110/5"		
88								
90	SB4-17				-Becomes wet at 90 feet	95/6"	105.9	22.7
92				SM	**DEL MAR FORMATION (Td)** Very dense, moist, pale bluish green with orange oxidation, Silty, fine to medium SANDSTONE			
94								
96	SB4-18					95/5"		
98								
100	SB4-19					100/6"	111.9	16.0
					BORING TERMINATED AT 100.5 FEET			

Figure A-7,
Log of Boring SB 4, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 5

ELEV. (MSL.) **74.5'** DATE COMPLETED **07/27/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, dry to damp, brown, Silty, fine SAND			
2	SB5-1			SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
4								
6	SB5-2					22 13	110.4	3.8
8								
10	SB5-3					36 21	108.4	5.0
12								
14								
16	SB5-4				-Becomes light brown and fine to medium grained below 15 feet	44 22	104.9	4.6
18								
20	SB5-5				-Becomes dense with orange oxidation and coarse grains present below 20 feet	50 35	104.4	4.0
22								
24								
26	SB5-6					61 34	100.8	2.0
28								
30	SB5-7				-Becomes very light brown and fine to coarse below 30 feet	50 33	100.3	2.3
32								
34								

Figure A-8,
Log of Boring SB 5, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 5

ELEV. (MSL.) **74.5'** DATE COMPLETED **07/27/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	SB5-8			SM	-Becomes salt and pepper gray below 35 feet	66 47	102.7	1.7
38								
40	SB5-9					91/9"	101.1	1.9
42					-Becomes light brown with gravel present at 42 feet	53		
44								
46	SB5-10			SM	**TORREY SANDSTONE (Tt)** Dense to very dense, damp, very light brown to white, Silty, fine to medium SANDSTONE	75 65	100.4	4.3
48								
50	SB5-11					84/11"	108.9	5.6
52						37		
54								
56	SB5-12				-Some coarse grains present in SPT sample	96/9" 95/9"	104.8	4.3
58								
60	SB5-13					60/6"		
62								
64								
66	SB5-14					57/6"	99.8	8.0
68								

Figure A-8,
Log of Boring SB 5, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 5

ELEV. (MSL.) **74.5'** DATE COMPLETED **07/27/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	SB5-15			SM	**DEL MAR FORMATION (Td)** Very dense, moist, pale bluish green with orange oxidation, Silty, fine to medium SANDSTONE	95/8"		
72								
74								
76	SB5-16					67/6"	112.7	15.3
78					-Water added below 78 feet			
80	SB5-17				-Dark gray to black bed observed in shoe	75/6"		
82								
84	SB5-18				-Becomes dark gray at 85 feet	80/6"	109.1	16.9
					BORING TERMINATED AT 85.5 FEET			

Figure A-8,
Log of Boring SB 5, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 6

ELEV. (MSL.) **79.5'** DATE COMPLETED **07/28/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, dry to damp, brown, Silty, fine SAND			
2								
4				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
6	SB6-1					27 19		
8								
10	SB6-2				-Becomes light brown with orange oxidation and fine to medium grained; trace black sand present	47 24	111.2	4.6
12								
14								
16	SB6-3				-Black sand absent	39 25	108.0	3.4
18								
20	SB6-4				-Becomes dense with some coarse sand present below 20 feet	54 34	105.8	3.4
22								
24								
26	SB6-5					58 31	103.8	1.5
28					-Becomes fine to medium below 27 feet			
30	SB6-6				-Becomes fine to coarse grained below 30 feet	55 36	101.7	2.3
32								
34								

Figure A-9,
Log of Boring SB 6, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING SB 6

ELEV. (MSL.) **79.5'** DATE COMPLETED **07/28/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	SB6-7			SM		53 38	92.4	1.8
38								
40	SB6-8					50 44	100.7	2.3
42								
44								
46	SB6-9					56 78	101.6	2.1
48					-Trace gravel present in SPT sampler			
50	SB6-10				-Trace gravel present in samples	60/6"	110.1	3.4
52				SM	**TORREY SANDSTONE (Tt)** Dense to very dense, damp, light brown with orange oxidation, Silty, fine to medium SANDSTONE	50/6"		
54								
56	SB6-11				-Some coarse sand present at 55 feet	64/4"	101.9	4.0
58								
60	SB6-12					60/4"	96.9	5.1
62								
64								
66	SB6-13				-Becomes moist below 65 feet	75/4"	114.5	12.6
68								

G1710-32-04.GPJ

Figure A-9,
Log of Boring SB 6, Page 2 of 3

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 6

ELEV. (MSL.) **79.5'** DATE COMPLETED **07/28/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	SB6-14			SM	-Becomes light brown and grayish brown below 70 feet	90/3"		
72								
74					-Water added below 73 feet			
76	SB6-15				-Becomes very light brown to white below 75 feet	95/6"	98.8	18.5
78								
80	SB6-16				-Becomes wet and orange brown below 80 feet	75/6"	98.3	27.5
82								
84				SM	**DEL MAR FORMATION (Td)**			
86	SB6-17				Very dense, damp to moist, pale bluish green, Silty, fine to medium SANDSTONE	122/6"	127.5	10.5
88								
90	SB6-18				-Becomes a pale bluish gray below 90 feet	121/6"	112.7	12.7
92								
94								
96	SB6-19					100/5"	113.4	9.4
98								
100	SB6-20					100/3"		
					BORING TERMINATED AT 100.5 FEET			

Figure A-9,
Log of Boring SB 6, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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GEOCON

PROJECT NO. G1710-32-04

BORING SB 7

ELEV. (MSL.) **80.5'** DATE COMPLETED **07/28/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, dry, brown, Silty, fine SAND			
2	SB7-1							
4				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
6	SB7-2					19 13	107.7	4.3
8								
10	SB7-3				-Some coarse sands present at 10 feet	36 20	108.8	7.7
12								
14								
16	SB7-4				-Becomes light brown below 15 feet	51 26	107.6	2.6
18								
20	SB7-5					37 26	103.0	2.3
22								
24								
26	SB7-6					44 28	105.0	2.4
28								
30	SB7-7					45 21	108.7	2.8
32								
34								

G1710-32-04.GPJ

Figure A-10,
Log of Boring SB 7, Page 1 of 3

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING SB 7

ELEV. (MSL.) **80.5'** DATE COMPLETED **07/28/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	SB7-8			SM		46 26	103.5	2.9
38								
40	SB7-9				-Becomes dense and fine to coarse grained below 40 feet	58 36	102.8	1.3
42								
44								
46	SB7-10					75 46	---	1.2
48								
50	SB7-11				-Gravel in shoe at 50.7 feet	90/8"	---	1.2
52				SM	**TORREY SANDSTONE (Tt)** Dense to very dense, damp, light brown with orange oxidation, Silty, fine to medium SANDSTONE	90		
54								
56	SB7-12					75/6"	102.7	3.9
58								
60	SB7-13					88		
62								
64								
66	SB7-14				-Water added below 65 feet	80/5"		
68								

Figure A-10,
Log of Boring SB 7, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 7

ELEV. (MSL.) **80.5'** DATE COMPLETED **07/28/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	SB7-15			SM	-Becomes moist below 70 feet	57/6"	103.3	17.7
72								
74								
76	SB7-16					80/6"		
78								
80	SB7-17					88/6"		
82				SM	**DEL MAR FORMATION (Td)** Very dense, moist, pale bluish green with orange mottling, Silty, fine to medium SANDSTONE			
84								
86	SB7-18					70/6"	117.2	16.1
88								
90	SB7-19			SM	-Becomes pale bluish gray with orange oxidation below 90 feet	86/3"		
92								
94								
96	SB7-20					95/2"		
98								
100	SB7-21				-Becomes wet at 100 feet	95/3"	107.0	20.2
					BORING TERMINATED AT 100.5 FEET			

Figure A-10,
Log of Boring SB 7, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

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PROJECT NO. G1710-32-04

BORING SB 8

ELEV. (MSL.) **74'** DATE COMPLETED **07/31/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				SM	**TOPSOIL** Loose, damp, brown, Silty, fine SAND			
2	SB8-1							
4				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
	SB8-2					31 19	109.4	4.5
6								
8								
10	SB8-3				-Same coarse sands at 10 feet	33 15	103.3	6.0
12								
14								
	SB8-4				-Becomes orange brown below 15 feet	44 29	108.6	4.7
16								
18								
20	SB8-5					47 24	107.1	2.0
22								
24								
	SB8-6					58 26	102.2	2.3
26								
28								
30	SB8-7				-Becomes light brown to brown and fine to coarse below 30 feet	57 37	99.4	2.2
32					-Gravel present in SPT sample -Rig chatter at 33.5 feet			
34				SM	**TORREY SANDSTONE (Tt)**			

Figure A-11,
Log of Boring SB 8, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 8

ELEV. (MSL.) **74'** DATE COMPLETED **07/31/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	SB8-8			SM	Dense to very dense, damp, light brown, Silty, fine to medium SAND	65/6"		
38								
40	SB8-9				-Becomes orange brown below 40 feet	53/6"	105.0	3.3
42								
44								
46	SB8-10				-Becomes gray with orange mottling below 45 feet	87/10"		
48								
50	SB8-11				-Becomes orange brown below 50 feet	50/6"		
52								
54								
56	SB8-12				-Becomes white to light gray below 55 feet	85/10"	102.2	4.3
58								
60	SB8-13				-Becomes pale orange brown below 60 feet	96/9"		
62								
64								
66	SB8-14				-Becomes white to gray below 65 feet	53/6"		
68								

Figure A-11,
Log of Boring SB 8, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 8

ELEV. (MSL.) **74'** DATE COMPLETED **07/31/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	SB8-15			SM	-Becomes moist below 70 feet	88/11"	116.6	17.1
72								
74								
76	SB8-16					96/9"		
78								
80	SB8-17					93/11"		
82								
84								
86	SB8-18				-Becomes wet below 85 feet	60/6"	106.2	21.3
88								
90	SB8-19					50/6"		
92								
94								
96	SB8-20			SM	**DEL MAR FORMATION (Td)** Very dense, moist, pale bluish green, Silty, fine to medium SANDSTONE	88/11"		
98								
100	SB8-21					80/6"	113.6	16.4
					BORING TERMINATED AT 100.5 FEET			

Figure A-11,
Log of Boring SB 8, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 9

ELEV. (MSL.) **87.5'** DATE COMPLETED **08/01/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, dry to damp, brown, Silty, fine SAND			
2								
4				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
6	SB9-1					33 21		
8								
10	SB9-2				-Becomes light brown with orange oxidation below 10 feet	38 17	102.4	5.0
12								
14								
16	SB9-3				-Some coarse sand below 15 feet	36 23	105.0	1.6
18								
20	SB9-4					58 28	105.8	2.4
22								
24								
26	SB9-5					48 27	103.2	2.7
28								
30	SB9-6					55 25	104.7	2.2
32								
34								

Figure A-12,
Log of Boring SB 9, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING SB 9

ELEV. (MSL.) **87.5'** DATE COMPLETED **08/01/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	SB9-7			SM		47 35	105.5	2.4
38					-Becomes dense and orange brown below 37 feet			
40	SB9-8				-Becomes light brown below 40 feet	56 36	106.2	3.0
42								
44								
46	SB9-9					49 33	100.0	2.7
48								
50	SB9-10				-Trace gravel present at 50 feet	60/6"	99.8	2.8
52				SM	**TORREY SANDSTONE (Tt)** Dense to very dense, damp, light brown with orange oxidation, Silty, fine to medium SAND	94/10"		
54								
56	SB9-11					60/6"	99.0	6.4
58								
60	SB9-12				-Becomes light brown to white with orange oxidation	70/6"		
62								
64								
66	SB9-13					95/10"		
68								

Figure A-12,
Log of Boring SB 9, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 9

ELEV. (MSL.) **87.5'** DATE COMPLETED **08/01/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	SB9-14			SM	-Water added below 70 feet	88/6"	95.3	4.6
72								
74								
76	SB9-15				-Becomes dark orange brown at 75.5 feet	97/9"		
78								
80	SB9-16				-Becomes light brown at 80 feet	67/6"		
82								
84								
86	SB9-17				-Becomes wet with some coarse sand at 85 feet	76/6"	101.0	22.7
88								
90	SB9-18					67/6"		
92								
94								
96	SB9-19			SM	**DEL MAR FORMATION (Td)** Very dense, moist to wet, pale bluish green, Silty, fine to medium SANDSTONE	80/6"		
98								
100	SB9-20					80/6"	120.3	12.7
					BORING TERMINATED AT 100.5 FEET			

Figure A-12,
Log of Boring SB 9, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 10

ELEV. (MSL.) **82'** DATE COMPLETED **08/01-02/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, dry to damp, brown, Silty, fine SAND			
2								
4				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
6	SB10-1				-Becomes fine to medium below 5 feet	17 12		
8								
10	SB10-2				-Becomes light brown with orange oxidation below 10 feet	46 27	110.8	8.1
12								
14								
16	SB10-3					50 25	99.0	5.2
18								
20	SB10-4					35 20	101.9	4.1
22								
24								
26	SB10-5					40 23	104.1	2.8
28								
30	SB10-6					45 28	104.2	2.6
32								
34								

G1710-32-04.GPJ

Figure A-13,
Log of Boring SB 10, Page 1 of 3

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 10

ELEV. (MSL.) **82'** DATE COMPLETED **08/01-02/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	SB10-7			SM		51 30	102.2	2.3
38					-Some coarse sand present below 37 feet			
40	SB10-8				-Becomes dense below 40 feet	58 40	104.9	2.3
42								
44								
46	SB10-9				-Becomes coarse with trace gravels below 46 feet	73 73	108.3	1.9
48				SM	**TORREY SANDSTONE (Tt)** Dense to very dense, damp, light brown with orange oxidation, Silty, fine to medium SAND			
50	SB10-10					97/9" 93	108.1	5.0
52								
54								
56	SB10-11					64/6"	99.5	8.0
58								
60	SB10-12				-Becomes very light brown to white below 60 feet	55/6"	98.9	5.0
62								
64								
66	SB10-13				-Becomes moist below 65 feet	62/6"	100.8	12.8
68								

Figure A-13,
Log of Boring SB 10, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 10

ELEV. (MSL.) **82'** DATE COMPLETED **08/01-02/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	SB10-14			SM	-Becomes wet below 70 feet	55/6"	94.9	24.5
72								
74								
76	SB10-15					73/6"	96.2	18.7
78								
80	SB10-16					95/6"	103.1	22.0
82								
84				SM	**DEL MAR FORMATION (Td)**			
86	SB10-17				Very dense, moist to wet, pale bluish green, Silty, fine to medium SANDSTONE	65/6"	121.2	12.9
88								
90	SB10-18					69/6"	117.0	15.3
92								
94								
96	SB10-19					78/6"	106.1	17.8
98								
100	SB10-20					95/6"	106.0	21.9
					BORING TERMINATED AT 100.5 FEET			

Figure A-13,
Log of Boring SB 10, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 11

ELEV. (MSL.) **73.5'** DATE COMPLETED **08/02/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, damp, brown, Silty, fine SAND			
2	SB11-1			SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
4								
6	SB11-2				-Becomes brown with orange mottling and fine to medium grained below 5 feet	16 15	112.9	4.7
8								
10	SB11-3				-Becomes orange brown below 10 feet	38 17	98.9	7.0
12								
14								
16	SB11-4				-Becomes light brown to gray below 15 feet	33 20	102.3	4.8
18								
20	SB11-5					46 22	106.1	4.9
22								
24								
26	SB11-6					59 24	105.4	3.6
28								
30	SB11-7				-Becomes very light brown below 30 feet	52 27	106.3	3.7
32								
34								

G1710-32-04.GPJ

Figure A-14,
Log of Boring SB 11, Page 1 of 3

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING SB 11

ELEV. (MSL.) **73.5'** DATE COMPLETED **08/02/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	SB11-8			SM	-Becomes dense and fine to coarse grained below 35 feet	68 36	109.7	2.4
38								
40	SB11-9				-Becomes light gray at 40 feet	68 35	103.4	3.9
42					-Becomes fine to medium below 42 feet			
44								
46	SB11-10				-Some trace gravel present at 46 feet	57 25	107.1	4.0
					-4-inch thick, orange bed present above contact			
48				SM	**TORREY SANDSTONE (Tt)** Dense to very dense, damp to moist, very light brown to white with some orange oxidation, Silty, fine to medium SANDSTONE			
50	SB11-11					45	112.2	10.8
52								
54								
56	SB11-12					72		
58								
60	SB11-13			SM	**DEL MAR FORMATION (Td)** Very dense, moist, pale green with orange mottling, Silty, fine to medium SANDSTONE	87/10"	115.0	15.6
62								
64								
66	SB11-14				-Becomes very pale greenish gray below 65 feet	55/6"	100.9	13.9
68								

Figure A-14,
Log of Boring SB 11, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING SB 11

ELEV. (MSL.) **73.5'** DATE COMPLETED **08/02/2017**

EQUIPMENT **CME 95 W/8-INCH AUGERS** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	SB11-15			SM		39		
72								
74								
76	SB11-16				-Becomes wet below 75 feet	56	106.4	20.5
78								
80	SB11-17					60/6"	117.0	14.0
82								
84								
86	SB11-18				-Becomes dark bluish gray below 85 feet -Shells present in shoe at 85.9 feet	105/10"	108.0	19.6
88								
90	SB11-19				-Becomes dark gray with shells at 90 feet	55/6"		
					BORING TERMINATED AT 90.5 FEET			

Figure A-14,
Log of Boring SB 11, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING LA 1

ELEV. (MSL.) **84.5'** DATE COMPLETED **07/20/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, damp, dark brown, Silty, fine SAND			
2	LA1-1			SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
4								
6	LA1-2				-Becomes light brown below 5 feet	19 11	110.6	1.6
8								
10	LA1-3				-Becomes fine to medium below 10 feet	26 14	107.7	2.6
12								
14								
16	LA1-4					23 17	109.2	1.7
18								
20	LA1-5				-Becomes very light brown below 20 feet	23 14	---	0.7
22								
24								
26	LA1-6					34 30	---	0.4
28								
30	LA1-7				-Driller commented that density increased below 30 feet -Becomes light brown to light gray below 31 feet	45 27	102.8	2.1
32								
34								

Figure A-15,
Log of Boring LA 1, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING LA 1

ELEV. (MSL.) **84.5'** DATE COMPLETED **07/20/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	LA1-8			SM		41	97.3	1.0
						28		
38								
40	LA1-9					32	102.2	1.7
					-Becomes very light brown to white below 41 feet	22		
42								
44								
	LA1-10				-1-inch thick, gravel lag deposit observed in upper sample at 45.5 feet	65		
46				SM	**TORREY SANDSTONE (Tt)**	62	109.6	8.8
48					Very dense, damp, light brown with orange mottling, Silty, fine to medium SANDSTONE			
50	LA1-11					50/6"	110.3	6.7
52								
54								
	LA1-12					50/6"		
56								
58								
60	LA1-13					95/11"	110.8	4.9
62								
64								
	LA1-14					83/11"		
66								
68								

Figure A-15,
Log of Boring LA 1, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING LA 1

ELEV. (MSL.) **84.5'** DATE COMPLETED **07/20/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	LA1-15			SM		88/10"		
72								
74								
	LA1-16			SM	**DEL MAR FORMATION (Td)** Very dense, damp, pale blue green, Silty, fine to medium SANDSTONE	100/5"	125.2	10.9
76								
78								
80	LA1-17					100/4"		
					BORING TERMINATED AT 80.5 FEET			

Figure A-15,
Log of Boring LA 1, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING LA 2

ELEV. (MSL.) **82'** DATE COMPLETED **07/21/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, damp, dark brown, Silty, fine SAND			
2				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
4								
6	LA2-1				-Becomes fine to medium below 5 feet	31 17		
8								
10	LA2-2				-Becomes brown to reddish brown below 10 feet	27 12	109.3	4.5
12								
14								
16	LA2-3				-Becomes light brown below 15 feet	26 15	105.3	6.2
18								
20	LA2-4					35 21	109.4	3.9
22								
24								
26	LA2-5				-Becomes very light brown below 26 feet	37 21	106.9	1.9
28								
30	LA2-6					37 18	108.3	3.0
32								
34								

Figure A-16,
Log of Boring LA 2, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING LA 2

ELEV. (MSL.) **82'** DATE COMPLETED **07/21/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	LA2-7			SM	-Becomes grayish brown below 35 feet	41 24	107.7	3.0
38								
40	LA2-8				-Becomes dense and salt and pepper gray from 40-41 feet	66	113.1	2.2
42					-Becomes dense and very light brown to white below 41 feet	40		
44								
46					-No recovery at 45 feet	44		
					-1-inch thick, gravel deposit at 46.5 feet; 4-inch dark brown lens present above contact	75/10"		
48				SM	**DEL MAR FORMATION (Td)**			
50	LA2-9				Very dense, damp to moist, pale green with orange mottling, Silty, fine to medium SANDSTONE	65/6"	120.0	10.9
52								
54								
56	LA2-10					110/6"		
58								
60	LA2-11				-Becomes light orange and pale green; water added below 30 feet	80/6"		
62								
64								
66	LA2-12					60/6"	111.9	10.5
68								

Figure A-16,
Log of Boring LA 2, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING LA 2

ELEV. (MSL.) **82'** DATE COMPLETED **07/21/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	LA2-13			SM	-Becomes dark orange with pale green mottling below 70 feet	55/6"		
72								
74								
76	LA2-14				-Becomes pale bluish gray below 75 feet	100/6"		
78								
80	LA2-15					110/6"	116.2	11.5
82								
84	LA2-16					170/6"		
					-Cemented dark gray shell bed at 85.5 feet			
					REFUSAL AT 85.5 FEET			

Figure A-16,
Log of Boring LA 2, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING LA 3

ELEV. (MSL.) **83.5'** DATE COMPLETED **07/24-27/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0		SM	**TOPSOIL** Loose, dry to damp, dark brown, Silty, fine SAND			
2	LA3-1	SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
4						
6	LA3-2			24 16	118.6	7.0
8						
10	LA3-3			41 21	115.1	4.6
12						
14						
16	LA3-4		-Becomes light brown at 15 feet	30 17	102.5	4.6
18						
20	LA3-5			41 23	112.6	3.4
22						
24						
26	LA3-6		-Becomes very light brown at 26 feet	25 16	102.0	3.7
28						
30	LA3-7			30 25	101.9	1.4
32			-Some light gray mottling present at 32 feet			
34						

Figure A-17,
Log of Boring LA 3, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

BORING LA 3

ELEV. (MSL.) **83.5'** DATE COMPLETED **07/24-27/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	LA3-8			SM	-Becomes grayish brown at 36 feet	34 25	107.8	4.4
40	LA3-9				-Becomes salt and pepper gray at 40 feet -Becomes light brown at 41 feet	45 27	104.6	4.1
46	LA3-10				-Becomes dense below 45 feet -Becomes black to very dark brown at 46 feet	74 42	104.3	3.0
50	LA3-11				-Rig chatter at 49 feet; gravels observed in sample at 50 feet	66/11"	105.3	2.0
52				SM	**TORREY SANDSTONE (Tt)** Very dense, damp to moist, light brown, Silty, fine to medium SANDSTONE			
56	LA3-12				-Becomes white below 55 feet	52/6"		
60					-Contact based on drill rig efficiency			
62	LA3-13			SM	**DEL MAR FORMATION (Td)** Very dense, damp, orange brown, Silty, fine to medium SANDSTONE	108/6"		
66	LA3-14				-Becomes moist and white to pale orange at 65 feet	55/6"	113.0	12.8
68								

G1710-32-04.GPJ

Figure A-17,
Log of Boring LA 3, Page 2 of 3

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING LA 3

ELEV. (MSL.) **83.5'** DATE COMPLETED **07/24-27/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **D. GITHENS**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	LA3-15			SM	-Becomes orange and pale green at 70 feet	55/6"		
72								
74								
76	LA3-16					98/6"		
78								
80	LA3-17				-Becomes pale green with dark gray mottling and fine grained below 80 feet	70/6"	114.7	16.8
82								
84					-Driller noted significant change in density at 84.5 feet; sample contained dark gray cemented shell bed	100/2"		
					REFUSAL AT 84.5 FEET			

Figure A-17,
Log of Boring LA 3, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING LA 4

ELEV. (MSL.) **85'** DATE COMPLETED **07/27-28/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, dry to damp, brown, Silty, fine SAND			
2				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
4								
6	LA4-1				-Becomes fine to medium below 5 feet	16 12	110.5	4.8
8								
10	LA4-2					27 24	108.9	7.0
12								
14								
16	LA4-3				-Becomes brown to reddish brown	30 14	111.9	4.5
18								
20	LA4-4					31 17	109.9	6.4
22								
24					-Water added below 24 feet			
26	LA4-5				-Becomes light brown below 25 feet	36 22	105.1	2.3
28								
30	LA4-6					50 24	107.8	1.2
32								
34								

Figure A-18,
Log of Boring LA 4, Page 1 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING LA 4

ELEV. (MSL.) **85'** DATE COMPLETED **07/27-28/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	LA4-7			SM	-Becomes orange-brown below 36 feet	55 27	109.0	3.5
38								
40	LA4-8				-Becomes dense and light brown below 40 feet -Becomes gray and light brown below 41 feet	42 31	101.9	2.1
42								
44								
46	LA4-9				-Becomes very light brown to white below 45 feet	70 38	105.2	3.1
48								
50	LA4-10				-Becomes very dense below 50 feet	80 68/11"	105.6	3.5
52					-4-inch thick, fine- to coarse-grained bed at 52 feet; gravel in shoe and 52.5 feet			
54				SM	-Rig chatter from 52.5 to 53 feet; contact based on drill rig efficiency and chatter			
56	LA4-11				**TORREY SANDSTONE (Tt)** Dense, damp, very light brown with orange mottling, Silty, fine to medium SANDSTONE with some coarse grains -Becomes very light brown to white below 56 feet	68 46	114.3	4.5
58								
60	LA4-12				-Becomes very dense and pale yellow with no coarse sand	115/6"	104.7	5.3
62								
64								
66	LA4-13					80/6"		
68								

Figure A-18,
Log of Boring LA 4, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING LA 4

ELEV. (MSL.) **85'** DATE COMPLETED **07/27-28/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	LA4-14			SM	-Contact observed in upper portion of sample between orange and pale green sandstone	80/6"	122.6	12.4
72					**DEL MAR FORMATION (Td)** Very dense, moist, pale green with orange staining, Silty, fine to medium SANDSTONE			
74								
76	LA4-15				-Becomes very pale green with some orange oxidation at 75 feet	85/6"		
78								
80	LA4-16					77/6"	111.6	14.6
					BORING TERMINATED AT 80.5 FEET			

Figure A-18,
Log of Boring LA 4, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04

BORING LA 5

ELEV. (MSL.) **81.5'** DATE COMPLETED **07/28-31/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, dry, dark brown, Silty, fine SAND			
2	LA5-1			SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine SAND			
4								
6	LA5-2				-Becomes fine to medium below 5 feet	36 29	113.3	4.7
8								
10	LA5-3				-Becomes reddish brown to brown below 10 feet	31 18	113.6	6.5
12								
14								
16	LA5-4				-Water added below 15 feet	31 20	112.0	5.7
18								
20	LA5-5				-Becomes brown to light brown below 20 feet	36 23	101.9	4.1
22								
24								
26	LA5-6				-Becomes very light brown to white below 25 feet	35 22	98.8	2.1
28								
30	LA5-7				-Becomes light brown to pale orange below 30 feet	38 24	105.2	2.7
32								
34								

G1710-32-04.GPJ

Figure A-19,
Log of Boring LA 5, Page 1 of 3

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING LA 5

ELEV. (MSL.) **81.5'** DATE COMPLETED **07/28-31/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
36	LA5-8			SM	-Becomes light brown below 35 feet	45 27	102.0	2.9
38								
40	LA5-9				-Becomes dense and very light brown to white below 40 feet with 2-3-inch thick dark gray bed at 40.2 feet -Becomes fine to coarse grained from 40.5 to 41.5 feet	57 38	107.1	2.0
42								
44								
46	LA5-10				-Coarse sand present below 45 feet	51	105.3	1.1
					-Sharp contact between gray and very light brown layers observed at 46.5 feet	37		
48				SM	**TORREY SANDSTONE (Tt)** Dense, damp to moist, light brown with orange mottling, Silty, fine to medium SANDSTONE			
50	LA5-11				-6-inch thick, brown and fine to coarse grained bed at 50 feet -Becomes very light brown to white below 50.5 feet	50 45	109.9	7.7
52								
54				SM	-Driller had to increase RPM at 53 feet; contact based on this change in density			
56	LA5-12				**DEL MAR FORMATION (Td)** Very dense, damp to moist, blue green with orange oxidation, Silty, fine SANDSTONE	70/6"	122.3	12.2
58								
60	LA5-13					90/6"		
62								
64								
66	LA5-14					58/6"	118.5	12.0
68								

Figure A-19,
Log of Boring LA 5, Page 2 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

BORING LA 5

ELEV. (MSL.) **81.5'** DATE COMPLETED **07/28-31/2017**

EQUIPMENT **FRASTE LIMITED ACCESS RIG** BY: **T. REIST**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
70	LA5-15			SM	-Becomes orange to dark orange with green mottling below 70 feet	90/10"		
72								
74								
76	LA5-16					58/6"	116.3	15.8
78								
80	LA5-17					97/6"		
					-Becomes wet and very light brown with some very pale green mottling at 80 feet			
					BORING TERMINATED AT 80.5 FEET			

Figure A-19,
Log of Boring LA 5, Page 3 of 3

G1710-32-04.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04 CC-1.dwg

BORING CC 1

ELEV. (MSL.) 75' DATE COMPLETED 07/17/2017

EQUIPMENT CME 75 BY: T. REIST

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	APPROXIMATE CORE SAMPLING INTERVAL (FT.)	APPROXIMATE LENGTH OF RECOVERY (IN.)	CORE BOX NO. & APPROX. CORE INTERVAL (FT.)
0				SM	**TOPSOIL** Loose, damp, grayish brown, Silty, fine SAND			
2				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense to dense, damp, reddish brown, Silty, fine SAND	0-5'	36"	BOX 1 0-10'
4								
6					-Becomes brown with orange mottling and fine to medium grained below 5 feet	5-10'	38"	
8								
10					-Becomes orange brown below 10 feet	10-15'	44"	BOX 2 10-20'
12								
14								
16					-Becomes light brown to gray with some orange oxidation below 15 feet	15-20'	40"	
18								
20						20-25'	44"	BOX 3 20-30'
22								
24								
26						25-30'	44"	
28								

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Figure A-20,
Log of Boring CC 1, Page 1 of 4

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04 CC-1.dwg

BORING CC 1

ELEV. (MSL.) 75' DATE COMPLETED 07/17/2017

EQUIPMENT CME 75 BY: T. REIST

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	APPROXIMATE CORE SAMPLING INTERVAL (FT.)	APPROXIMATE LENGTH OF RECOVERY (IN.)	CORE BOX NO. & APPROX. CORE INTERVAL (FT.)
30				SM	-Becomes very light brown to light gray below 30 feet	30-35'	35"	BOX 4 30-40'
32								
34								
					-Becomes light brown with orange oxidation below 35 feet	35-40'	28"	
36								
38								
40					-Becomes light gray and fine to coarse below 40 feet	40-45'	30"	BOX 5 40-50'
42								
44								
46						45-50'	36"	
				SM	-1 to 2-inch thick, gravel lag deposit with some dark brown clayey sand present above contact			
48					**TORREY SANDSTONE (Tt)** Dense, damp, very light brown to white with some orange oxidation, Silty, fine to medium SANDSTONE; noticeable increase in cohesion from Old Paralic Deposits			
50								
52						50-55'	51"	BOX 6 50-60'
					-4-inch thick, orange lens at 53.5 feet -4-inch thick, very dark brown lens at 54 feet			
54								
56						55-60'	44"	
					-Some yellowish brown oxidation present from 57 to 59 feet			
58								

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Figure A-20,
Log of Boring CC 1, Page 2 of 4

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. G1710-32-04 CC-1.dwg

BORING CC 1

ELEV. (MSL.) 75' DATE COMPLETED 07/17/2017

EQUIPMENT CME 75 BY: T. REIST

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	APPROXIMATE CORE SAMPLING INTERVAL (FT.)	APPROXIMATE LENGTH OF RECOVERY (IN.)	CORE BOX NO. & APPROX. CORE INTERVAL (FT.)
60				SM	-Becomes yellowish brown below 61 feet	60-65'	56"	BOX 7 60-65'
62								
64								
66					-Driller noted more difficult drilling below 66.5 feet	65-70'	58"	BOX 8 65-74'
68				SM	**DEL MAR FORMATION (Td)** Dense to very dense, damp to moist, grayish green, Silty, fine to medium SANDSTONE; noticeable increase in cohesion from Torrey Sandstone			
70								
72					-Becomes yellowish gray-green below 71.5 feet	70-75'	60"	
74								
76					-Some orange oxidation present below 76.5 feet	75-80'	60"	BOX 9 74-84'
78								
80					-4-inch thick, dark orange bed at 79 feet			
82						80-85'	60"	
84					-18-inch thick, dark orange and purple beds at 83.5 feet			
86					-Becomes yellowish blue-green below 86.5 feet	85-90'	60"	BOX 10 84-92.5'
88								

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Figure A-20,
Log of Boring CC 1, Page 3 of 4

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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GEOCON

PROJECT NO. G1710-32-04 CC-1.dwg

BORING CC 1

ELEV. (MSL.) 75' DATE COMPLETED 07/17/2017

EQUIPMENT CME 75 BY: T. REIST

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	APPROXIMATE CORE SAMPLING INTERVAL (FT.)	APPROXIMATE LENGTH OF RECOVERY (IN.)	CORE BOX NO. & APPROX. CORE INTERVAL (FT.)
90				SM	-Becomes yellowish brown below 90 feet			
					-Becomes dark gray below 91 feet	90-92.5'	30"	BOX 10 84-92.5'
92					-Cemented shell bed present at 92 feet; difficult drilling			
					REFUSAL AT 92.5 FEET			

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Figure A-20,
Log of Boring CC 1, Page 4 of 4

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▩ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04 CC-2.dwg

BORING CC 2

ELEV. (MSL.) 76' DATE COMPLETED 07/18/2017

EQUIPMENT CME 75 BY: T. REIST

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	APPROXIMATE CORE SAMPLING INTERVAL (FT.)	APPROXIMATE LENGTH OF RECOVERY (IN.)	CORE BOX NO. & APPROX. CORE INTERVAL (FT.)
0				SM	**TOPSOIL** Loose, damp, brown, Silty, fine SAND			
2				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense to dense, damp, reddish brown, Silty, fine SAND	0-5'	32"	
4								
6					-Becomes damp to moist and fine to medium below 5 feet			
8					-Becomes brown with orange mottling below 7 feet	5-10'	36"	BOX 1 0-15'
10								
12						10-15'	26"	
14								
16					-Becomes orange-brown and gray below 15 feet			
18						15-20'	27"	
20					-Becomes grayish brown below 20 feet			
22						20-25'	31"	BOX 2 15-35'
24								
26					-Becomes gray with some orange mottling below 25 feet			
28						25-30'	29"	

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Figure A-21,
Log of Boring CC 2, Page 1 of 4

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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GEOCON

PROJECT NO. G1710-32-04 CC-2.dwg

BORING CC 2

ELEV. (MSL.) 76' DATE COMPLETED 07/18/2017

EQUIPMENT CME 75 BY: T. REIST

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	APPROXIMATE CORE SAMPLING INTERVAL (FT.)	APPROXIMATE LENGTH OF RECOVERY (IN.)	CORE BOX NO. & APPROX. CORE INTERVAL (FT.)
30				SM	-Becomes predominantly gray below 30 feet	30-35'	31"	BOX 2 15-35'
32								
34								
36					-1-2-inch thick, gravel lag deposit present above contact	35-40'	42"	BOX 3 35-47'
38				SM	**TORREY SANDSTONE (Tt)** Dense, damp, light orange gray, Silty, fine to medium SANDSTONE; noticeable increase in cohesion from Old Paralic Deposits			
40					-Becomes orange brown below 40 feet	40-45'	46"	
42								
44					-Becomes gray with some orange mottling below 43.5 feet	45-50'	56"	
46								
48								BOX 4 47-59'
50					-Becomes orange brown below 50 feet	50-55'	46"	
52								
54					-Becomes white to light gray below 54 feet	55-60'	54"	
56								
58					-Becomes orange-brown from 57.5 to 59 feet with two 1/4-inch thick, dark gray claystone/siltstone beds (no apparent remolding) at 58 feet			BOX 5 59-74'

Y:\PROJECTS\G1710-32-04 Border Avenue Properties_Continuous Core Logs\G1710-32-04 CC-2.dwg

Figure A-21,
Log of Boring CC 2, Page 2 of 4

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04 CC-2.dwg

BORING CC 2

ELEV. (MSL.) 76' DATE COMPLETED 07/18/2017

EQUIPMENT CME 75 BY: T. REIST

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	APPROXIMATE CORE SAMPLING INTERVAL (FT.)	APPROXIMATE LENGTH OF RECOVERY (IN.)	CORE BOX NO. & APPROX. CORE INTERVAL (FT.)
60				SM	-Becomes light orange-brown below 60 feet			
62						60-65'	41"	
64					-Becomes white to gray below 64 feet			
66								BOX 5 59-74'
68						65-70'	22"	
70					-Becomes moist to very moist and very dark brown below 69.5 feet			
72						70-75'	37"	
74					-Becomes gray and light brown with orange mottling below 73.5 feet			
			▼		-Becomes wet to saturated below 75 feet			
76								
78						75-80'	40"	
80					-Driller unable to recover intact samples due to heaving sands; switched to 2-inch split-spoon sampler used for remainder of the drilling -53 blows for 18-inches at 80 feet	80-81.5'	9"	
82					-85 blows for 18-inches at 81.5 feet	81.5-83'	13"	BOX 6 74-90'
84					-137 blows for 14-inches at 83 feet	83-85'	14"	
86					-108 blows for 10-inches at 85 feet	85-86.5'	10"	
					-110 blows for 7-inches at 86.5 feet	86.5-88'	7"	
88					-125 blows for 16-inches at 88 feet	88-90'	16"	

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Figure A-21,
Log of Boring CC 2, Page 3 of 4

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04 CC-2.dwg

BORING CC 2

ELEV. (MSL.) 76' DATE COMPLETED 07/18/2017

EQUIPMENT CME 75 BY: T. REIST

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	APPROXIMATE CORE SAMPLING INTERVAL (FT.)	APPROXIMATE LENGTH OF RECOVERY (IN.)	CORE BOX NO. & APPROX. CORE INTERVAL (FT.)
90				SM	-122 blows for 11-inches at 90 feet	90-91.5'	11"	BOX 7 90-100'
92					-114 blows for 10-inches at 91.5 feet	91.5-93'	10"	
94					-95 blows for 11-inches at 93 feet	93-95'	11"	
96					-78 blows for 10-inches at 95 feet	95-96.5'	10"	
98				SM	**DEL MAR FORMATION (Td)** Dense to very dense, moist, grayish green with orange mottling, Silty, fine to medium SANDSTONE; noticeable increase in cohesion from Torrey Sandstone -94 blows for 7-inches at 96.5 feet -Becomes blue-gray below 98 feet	96.5-98'	7"	
100					-200 blows for 17-inches at 98 feet	98-100'	17"	
					BORING TERMINATED AT 100 FEET			

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Figure A-21,
Log of Boring CC 2, Page 4 of 4

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 1 ELEV. (MSL.) 75' DATE COMPLETED 03-10-2016 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. EVANS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0	T1-1			SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND			
2					-Gradational contact			
4				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND -Becomes dense at 5 feet			
6					TRENCH TERMINATED AT 6 FEET			

Figure A-22,
Log of Trench T 1, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 2 ELEV. (MSL.) 75' DATE COMPLETED 03-10-2016 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. EVANS MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND			
2				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND; banded with red-brown clay films			
4	T2-1				-Becomes very dense at 5 feet			
6								
8					TRENCH TERMINATED AT 8 FEET			

Figure A-23,
Log of Trench T 2, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 3 ELEV. (MSL.) 79' DATE COMPLETED 03-10-2016 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. EVANS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND; heavy palm roots			
2				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND; slightly cemented; excavates in chunks			
4								
6					TRENCH TERMINATED AT 6 FEET			

Figure A-24,
Log of Trench T 3, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 4 ELEV. (MSL.) 83 DATE COMPLETED 03-10-2016 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. EVANS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND; heavy roots and organics to 4 feet			
2								
4								
6				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND; slightly cemented; excavates in chunks			
8					TRENCH TERMINATED AT 8 FEET			

Figure A-25,
Log of Trench T 4, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 5 ELEV. (MSL.) 84' DATE COMPLETED 03-10-2016 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. EVANS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND; very heavy roots to 4 feet			
2								
4								
6				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND; slightly cemented; excavates in chunks			
8								
					TRENCH TERMINATED AT 9 FEET			

Figure A-26,
Log of Trench T 5, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 6 ELEV. (MSL.) 86' DATE COMPLETED 03-10-2016 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. EVANS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND			
2					-Gradational contact			
				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND			
4								
6					TRENCH TERMINATED AT 6 FEET			

Figure A-27,
Log of Trench T 6, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 7 ELEV. (MSL.) 76' DATE COMPLETED 03-10-2016 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. EVANS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND			
2					-Gradational contact			
				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND; slightly cemented; excavates in chunks			
4								
6					TRENCH TERMINATED AT 6 FEET			

Figure A-28,
Log of Trench T 7, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 8** ELEV. (MSL.) **87'** DATE COMPLETED **03-10-2016** EQUIPMENT **JD 410 RUBBER TIRE BACKHOE** BY: **D. EVANS**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND; abundant rootlets			
2				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND; slightly cemented; excavates in chunks			
4					TRENCH TERMINATED AT 5 FEET			

Figure A-29,
Log of Trench T 8, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 9 ELEV. (MSL.) 87' DATE COMPLETED 03-10-2016 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. EVANS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND; abundant roots			
2				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND; slightly cemented; excavates in chunks			
4								
6					TRENCH TERMINATED AT 6 FEET			

Figure A-30,
Log of Trench T 9, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 10** ELEV. (MSL.) **70'** DATE COMPLETED **03-10-2016** EQUIPMENT **JD 410 RUBBER TIRE BACKHOE** BY: **D. EVANS**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND; abundant roots			
2					-Gradational contact			
				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND			
4								
6					TRENCH TERMINATED AT 6 FEET			

Figure A-31,
Log of Trench T 10, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 11 ELEV. (MSL.) 75' DATE COMPLETED 03-10-2016 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. EVANS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0	T11-1			SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND; heavy organics; 1-foot diameter roots			
2								
4				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND			
6								
					TRENCH TERMINATED AT 7 FEET			

Figure A-32,
Log of Trench T 11, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 12 ELEV. (MSL.) 87' DATE COMPLETED 03-10-2016 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. EVANS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND; abundant organics			
2								
4				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND			
6					TRENCH TERMINATED AT 6 FEET			

Figure A-33,
Log of Trench T 12, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 13 ELEV. (MSL.) 81' DATE COMPLETED 03-10-2016 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. EVANS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND; abundant organics and roots			
2								
4								
				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND			
					TRENCH TERMINATED AT 5 FEET			

Figure A-34,
Log of Trench T 13, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 14** ELEV. (MSL.) **84'** DATE COMPLETED **03-10-2016** EQUIPMENT **JD 410 RUBBER TIRE BACKHOE** BY: **D. EVANS**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, damp, medium to dark brown, Silty, fine SAND; abundant organics			
2				SM/SP	**OLD PARALIC DEPOSITS** Medium dense to dense, orange brown, Silty, fine SAND			
4					TRENCH TERMINATED AT 5 FEET			

Figure A-35,
Log of Trench T 14, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 15 ELEV. (MSL.) 89' DATE COMPLETED 08/04/2017 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. GITHENS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0	T15-1			SM	**TOPSOIL** Loose, dry to damp, reddish brown, Silty, fine SAND			
2					-Gradational contact			
				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine to medium SAND			
4								
6								
8								
10								
12					TRENCH TERMINATED AT 12 FEET			

Figure A-36,
Log of Trench T 15, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 16 ELEV. (MSL.) 84' DATE COMPLETED 08/04/2017 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. GITHENS MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, dry to damp, light brown, Silty, fine SAND			
2								
4					-Gradational contact			
				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine to medium SAND			
6								
8	T16-1				-Becomes pale brown with some black sand			
10					TRENCH TERMINATED AT 10 FEET			

Figure A-37,
Log of Trench T 16, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 17** ELEV. (MSL.) **69'** DATE COMPLETED **08/04/2017** EQUIPMENT **JD 410 RUBBER TIRE BACKHOE** BY: **D. GITHENS**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, dry to damp, light brown, Silty, fine SAND			
2								
					-Gradational contact			
4				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, reddish brown, Silty, fine to medium SAND			
6								
8					-Becomes light brown with some black sand			
					TRENCH TERMINATED AT 9.5 FEET			

Figure A-38,
Log of Trench T 17, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 18 ELEV. (MSL.) 69' DATE COMPLETED 08/04/2017 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. GITHENS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, dry, light brown, Silty, fine SAND			
					-Gradational contact			
2				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, damp, reddish brown, Silty, fine to medium SAND			
4								
6					-Becomes light brown			
					TRENCH TERMINATED AT 7.5 FEET			

Figure A-39,
Log of Trench T 18, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 19 ELEV. (MSL.) 84' DATE COMPLETED 08/04/2017 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. GITHENS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, dry to damp, light brown, Silty, fine SAND			
2					-Gradational contact			
				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, reddish brown, Silty, fine to medium SAND			
4								
6								
					TRENCH TERMINATED AT 7.5 FEET			

Figure A-40,
Log of Trench T 19, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 20 ELEV. (MSL.) 91' DATE COMPLETED 08/04/2017 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. GITHENS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, dry to damp, light brown, Silty, fine SAND			
2					-Gradational contact			
4				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, reddish brown, Silty, fine to medium SAND			
6								
8								
					TRENCH TERMINATED AT 9 FEET			

Figure A-41,
Log of Trench T 20, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 21 ELEV. (MSL.) 80' DATE COMPLETED 08/04/2017 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. GITHENS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0	T21-1			SM	**TOPSOIL** Loose, dry to damp, light brown, Silty, fine SAND			
					-Gradational contact			
2				SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, reddish brown, Silty, fine to medium SAND			
4								
6								
8					TRENCH TERMINATED AT 8 FEET			

Figure A-42,
Log of Trench T 21, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G1710-32-04

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 22 ELEV. (MSL.) 82' DATE COMPLETED 08/04/2017 EQUIPMENT JD 410 RUBBER TIRE BACKHOE BY: D. GITHENS	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, dry to damp, light brown, Silty, fine SAND			
2					-Gradational contact			
	T22-1			SM	**OLD PARALIC DEPOSITS (Qop)** Medium dense, reddish brown, Silty, fine to medium SAND			
4								
6								
8					TRENCH TERMINATED AT 8 FEET			

Figure A-43,
Log of Trench T 22, Page 1 of 1

G1710-32-04.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

APPENDIX B

APPENDIX B

LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. Selected relatively undisturbed ring, chunk, and bulk samples were tested for in-place dry density and moisture content, maximum dry density and optimum moisture content, shear strength, expansion characteristics, gradation and consolidation characteristics. The results of our laboratory tests are summarized on Tables B-I through B-III and **Figures B-1 through B-15.** A composite graph depicting the direct shear test results for the Old Paralic Deposits, Torrey Sandstone and Del Mar Formation is presented on **Figures B-16 through B-18.** The results of the dry density and moisture content tests are presented on the boring logs in Appendix A.

TABLE B-I
SUMMARY OF LABORATORY MAXIMUM DRY DENSITY
AND OPTIMUM MOISTURE CONTENT TEST RESULTS
ASTM D 1557

Sample No. (Geologic Unit)	Description	Maximum Dry Density (pcf)	Optimum Moisture Content (% dry wt.)
T2-1 (Qop_6)	Orange brown, Silty, fine SAND	128.2	9.4
T11-1 (Topsoil)	Dark brown, Silty, fine SAND	127.8	8.6
T15-1 (Topsoil)	Reddish brown, Silty, fine SAND	125.5	9.2

TABLE B-II
SUMMARY OF LABORATORY DIRECT SHEAR TEST RESULTS
ASTM D 3080

Sample No.	Geologic Unit (Soil Class)	Dry Density (pcf)	Moisture Content (%)	Unit Cohesion Peak (psf)	Angle of Shear Resistance Peak (degrees)
T2-1*	Qop_6 (SM/SP)	115.1	9.2	510	27
T11-1*	Topsoil (SM)	114.6	8.5	340	28
T15-1*	Topsoil (SM)	112.9	9.4	650	27
LB1-2	Qop_6 (SM/SP)	107.4	6.8	280	31
LB1-3	Qop_6 (SM/SP)	102.2	3.4	200	33
LB1-4	Qop_6 (SM/SP)	105.7	4.6	120	34
LB1-6	Qop_6 (SM/SP)	95.8	3.6	385	30

TABLE B-II (Continued)
SUMMARY OF LABORATORY DIRECT SHEAR TEST RESULTS
ASTM D 3080

Sample No.	Geologic Unit (Soil Class)	Dry Density (pcf)	Moisture Content (%)	Unit Cohesion Peak (psf)	Angle of Shear Resistance Peak (degrees)
LB2-3	Qop_6 (SM/SP)	105.6	3.7	180	34
LB2-5	Qop_6 (SM/SP)	103.0	4.3	295	30
LB2-6	Qop_6 (SM/SP)	99.1	2.9	440	28
LB2-7	Qop_6 (SM/SP)	100.1	2.3	50	37
LB2-8	Qop_6 (SM/SP)	103.9	4.5	180	34
SB2-5	Qop_6 (SM)	105.9	3.5	680	28
SB2-9	Qop_6 (SM)	106.2	4.0	0	38
SB3-8	Qop_6 (SM)	104.9	2.8	535	35
SB3-14	Tt (SM)	113.8	4.7	100	40
SB4-13	Tt (SM)	101.8	4.4	200	36
SB4-19	Td (SM)	111.9	16.0	1640	32
SB5-4	Qop_6 (SM)	104.9	4.6	585	36
SB5-7	Qop_6 (SM)	100.3	2.3	450	36
SB5-10	Tt (SM)	100.4	4.3	0	35
SB5-16	Td (SM)	112.7	15.3	830	31
SB6-4	Qop_6 (SM)	105.8	3.4	500	34
SB6-8	Qop_6 (SM)	100.7	2.3	180	42
SB6-16	Tt (SM)	98.3	27.5	605	32
SB6-18	Td (SM)	112.7	12.7	1335	27
SB10-4	Qop_6 (SM)	101.9	4.1	830	25
SB10-7	Qop_6 (SM)	102.2	2.3	430	37
SB10-11	Tt (SM)	99.5	8.0	825	31
SB10-17	Tt (SM)	121.2	12.9	2795	32
SB11-16	Td (SM)	106.4	20.5	880	28
SB11-18	Td (SM)	108.0	19.6	1570	25
LA2-4	Qop_6 (SM)	109.4	3.9	585	32
LA2-7	Qop_6 (SM)	107.7	3.0	0	40
LA3-4	Qop_6 (SM)	102.5	4.6	330	38
LA3-9	Qop_6 (SM)	104.6	4.1	225	36
LA4-2	Qop_6 (SM)	108.9	7.0	710	29
LA4-8	Qop_6 (SM)	101.9	2.1	150	37
LA4-16	Td (SM)	111.6	14.6	700	38

TABLE B-II (Concluded)
SUMMARY OF LABORATORY DIRECT SHEAR TEST RESULTS
ASTM D 3080

Sample No.	Geologic Unit (Soil Class)	Dry Density (pcf)	Moisture Content (%)	Unit Cohesion Peak (psf)	Angle of Shear Resistance Peak (degrees)
Chunk A	Tt (SM)	109.2	14.6	985	37
Chunk B	Tt (SM)	107.0	15.9	1575	38
Chunk C	Tt (SM)	97.4	1.7	1290	35
Chunk D	Tt (SM)	113.1	13.5	2890	39
Chunk E	Tt (SM)	108.3	14.9	530	49
Chunk F	Tt (SM)	113.0	11.7	1820	41
Chunk G	Td (SM)	114.4	13.5	3185	41
Chunk H	Td (SM)	110.5	13.1	720	47
Chunk I	Td (SM)	115.7	12.0	1505	44
Off-site	Tt (SM)	114	5.5	0	42
Off-site	Tt (SM)	117.2	13.9	505	42

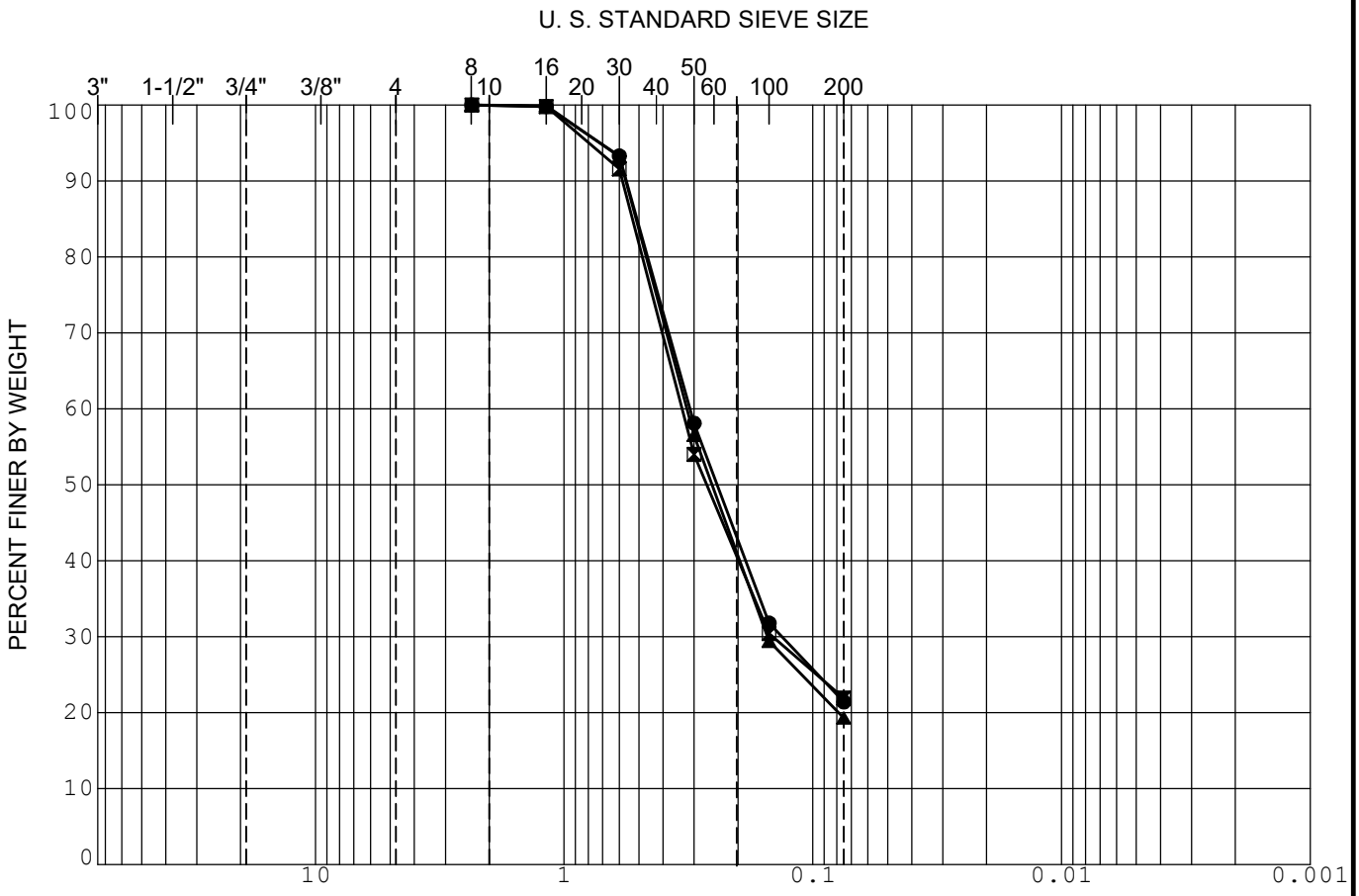
*Sample was remolded to 90 percent relative compaction at near optimum moisture content.

TABLE B-III
SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS
ASTM D 4829

Sample No. (Geologic Unit)	Moisture Content		Dry Density (pcf)	Expansion Index
	Before Test (%)	After Test (%)		
T1-1 (Topsoil)	7.9	11.4	116.5	0
T2-1 (Qop_6)	8.8	13.7	113.1	0
T11-1 (Topsoil)	7.8	11.5	117.0	0
T15-1 (Topsoil)	8.1	14.2	118.2	0

PROJECT NO. G1710-32-04

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



ASTM D422

	SAMPLE	DEPTH (ft)	CLASSIFICATION	NAT WC	LL	PL	PI
●	LA3-1	2.0	SM - Silty SAND				
⊠	LA5-1	2.0	SM - Silty SAND				
▲	SB2-1	2.0	SM - Silty SAND				

GRADATION CURVE

MARISOL

DEL MAR, CALIFORNIA

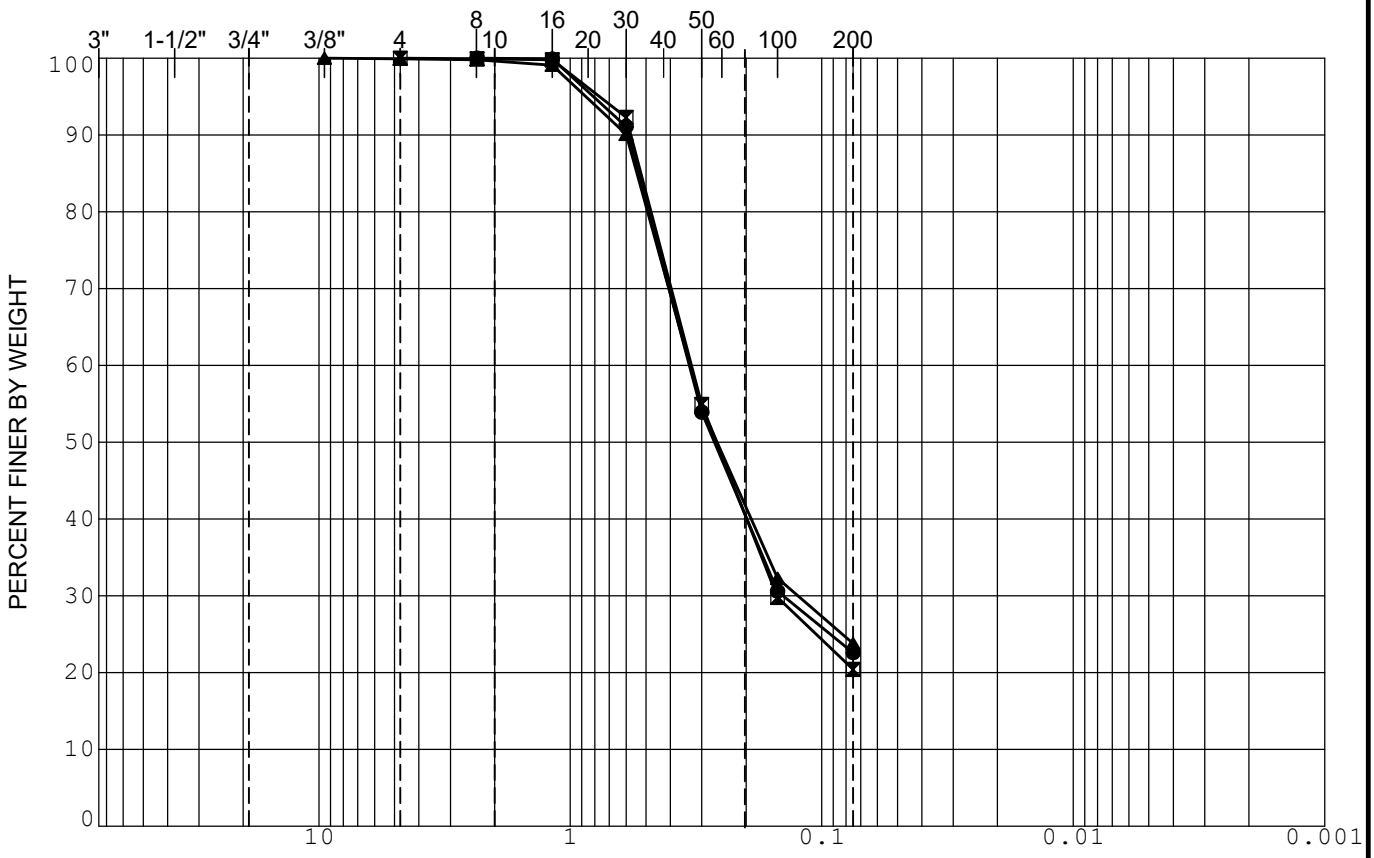
G1710-32-04.GPJ

Figure B-1

GEOCON

PROJECT NO. G1710-32-04

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



ASTM D422

	SAMPLE	DEPTH (ft)	CLASSIFICATION	NAT WC	LL	PL	PI
●	SB5-1	2.0	SM - Silty SAND				
⊠	SB7-1	2.0	SM - Silty SAND				
▲	SB11-1	2.0	SM - Silty SAND				

GRADATION CURVE

MARISOL

DEL MAR, CALIFORNIA

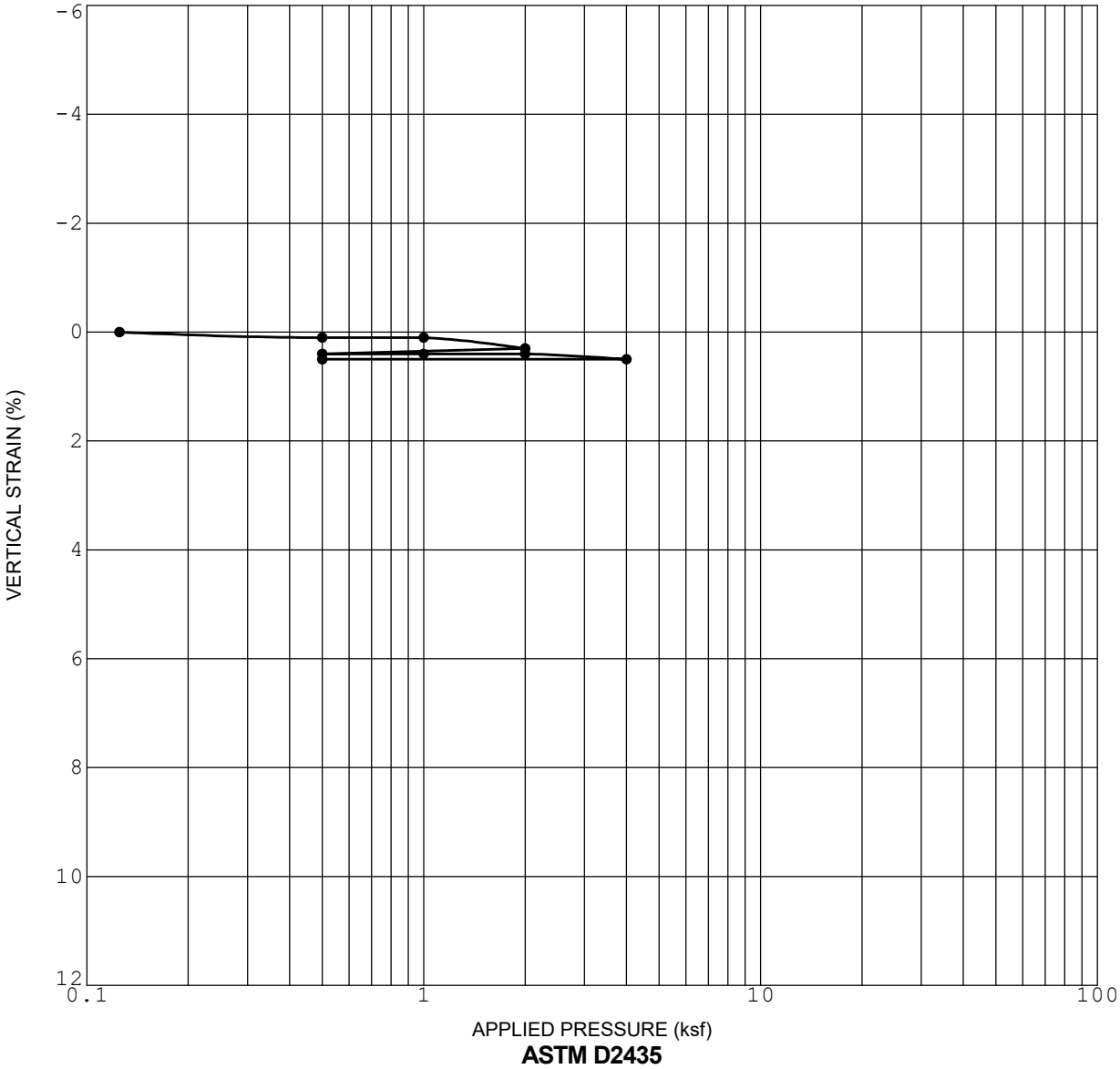
G1710-32-04.GPJ

Figure B-2

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. LA1-7



ASTM D2435

Initial Dry Density (pcf)	102.8	**Initial Saturation (%)**	9.1
Initial Water Content (%)	2.1	**Sample Saturated at (ksf)**	0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

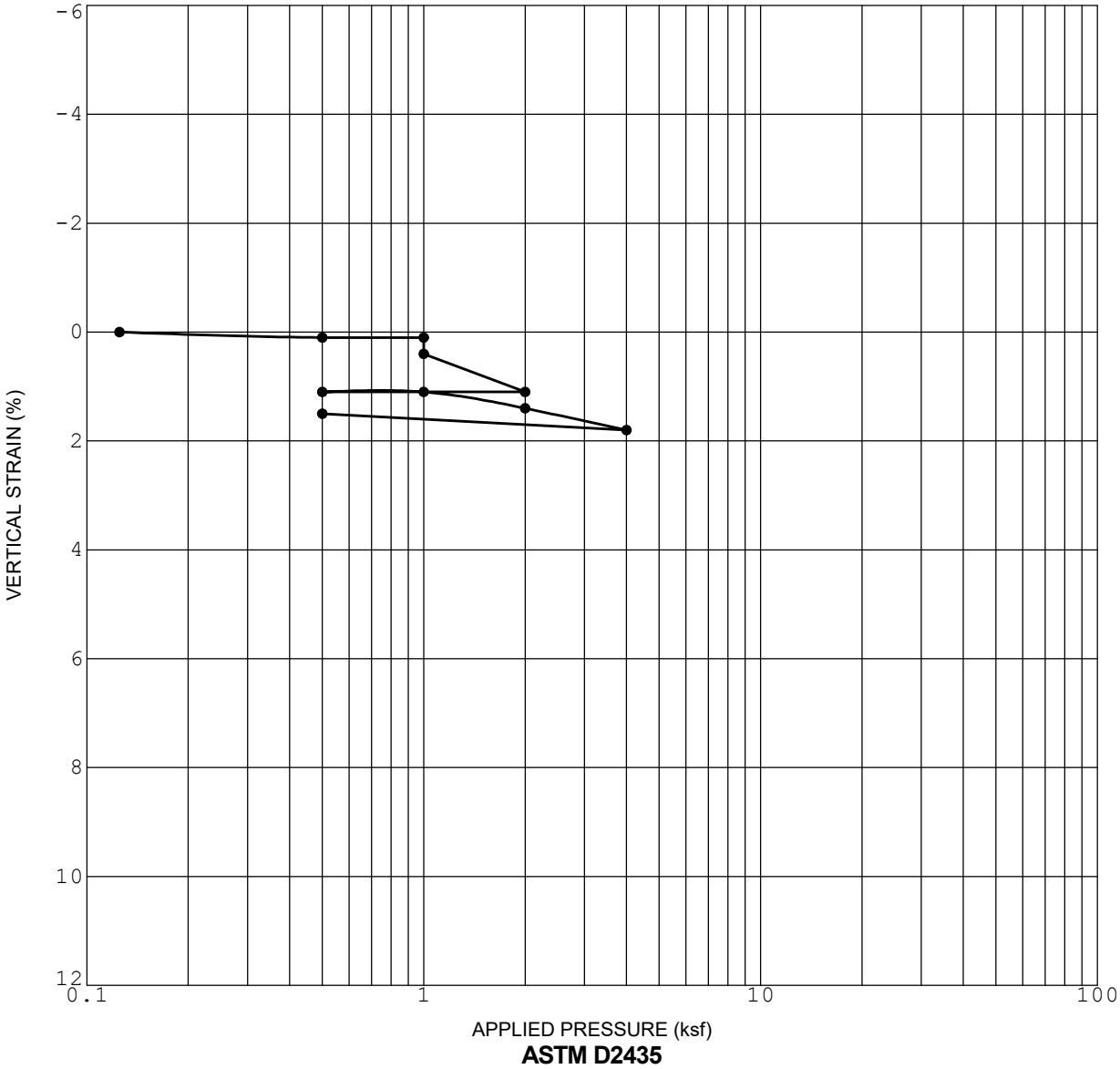
G1710-32-04.GPJ

Figure B-3

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. LA2-3



ASTM D2435

Initial Dry Density (pcf)	105.3	**Initial Saturation (%)**	28.7
Initial Water Content (%)	6.2	**Sample Saturated at (ksf)**	1.0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

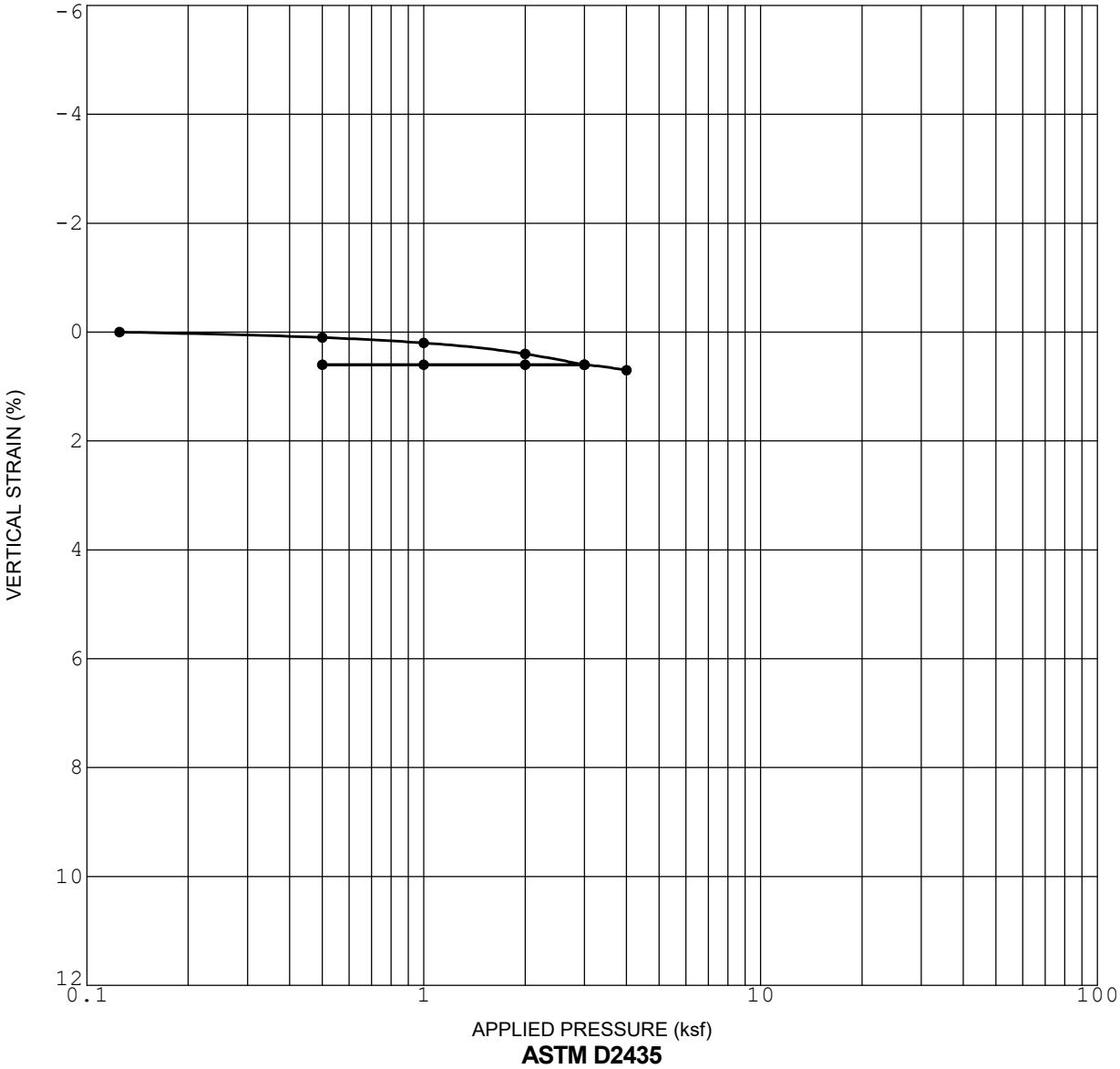
G1710-32-04.GPJ

Figure B-4

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. LA3-6



ASTM D2435

Initial Dry Density (pcf)	102.0	**Initial Saturation (%)**	15.8
Initial Water Content (%)	3.7	**Sample Saturated at (ksf)**	0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

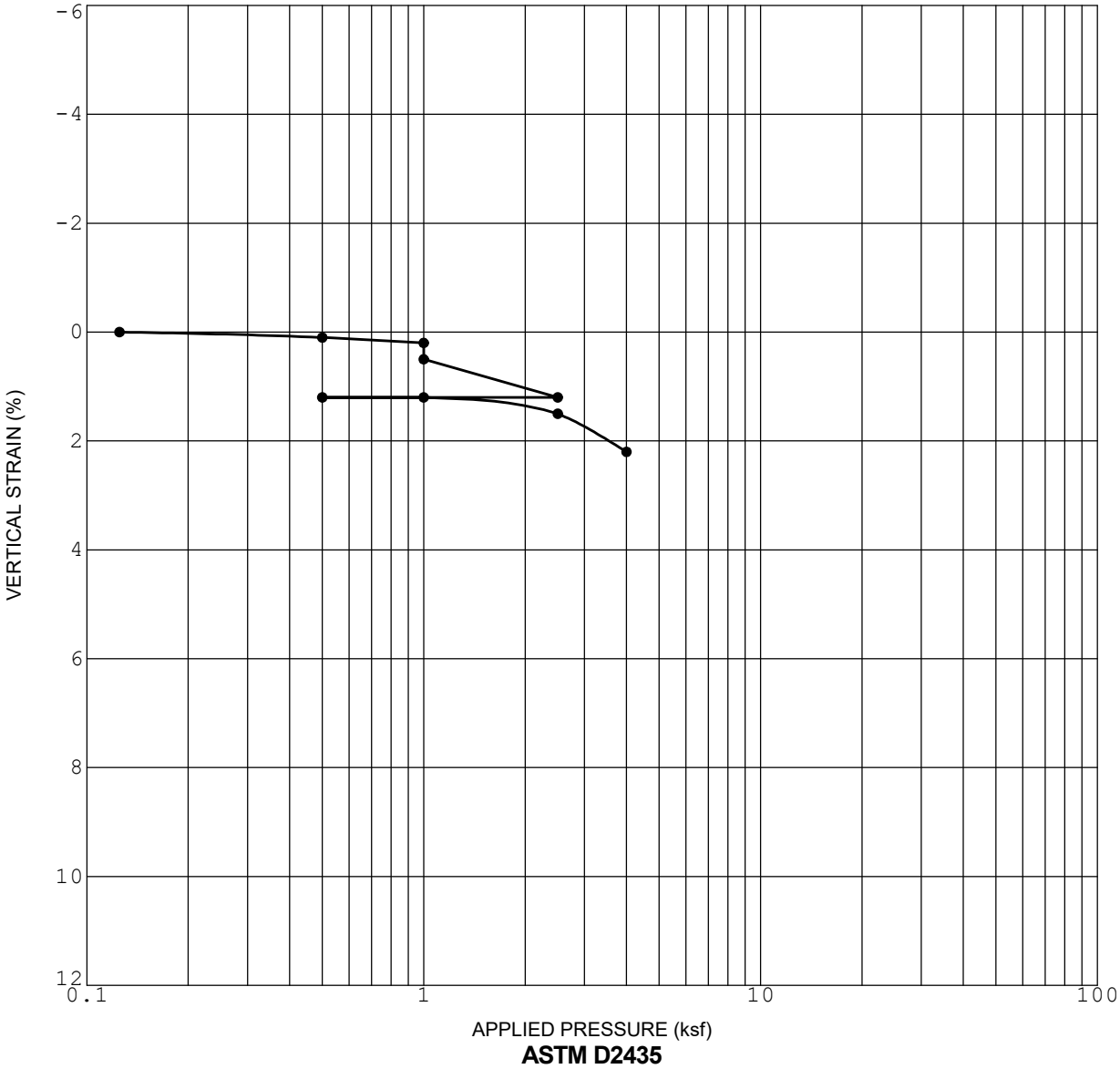
G1710-32-04.GPJ

Figure B-5

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. LA4-4



ASTM D2435

Initial Dry Density (pcf)	109.9	**Initial Saturation (%)**	33.1
Initial Water Content (%)	6.4	**Sample Saturated at (ksf)**	1.0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

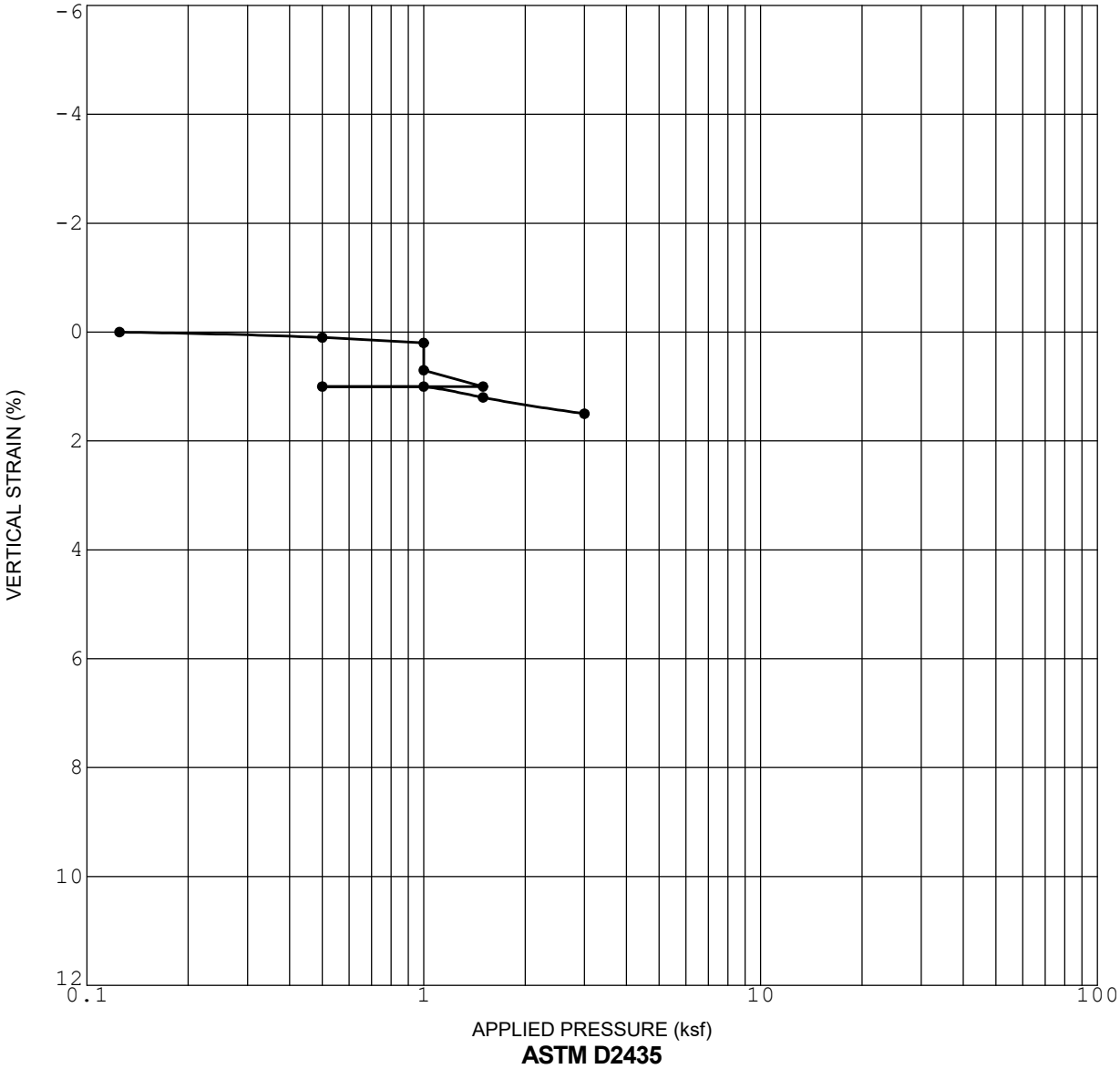
G1710-32-04.GPJ

Figure B-6

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. SB2-3



ASTM D2435

Initial Dry Density (pcf)	108.7	**Initial Saturation (%)**	24.8
Initial Water Content (%)	4.9	**Sample Saturated at (ksf)**	1.0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

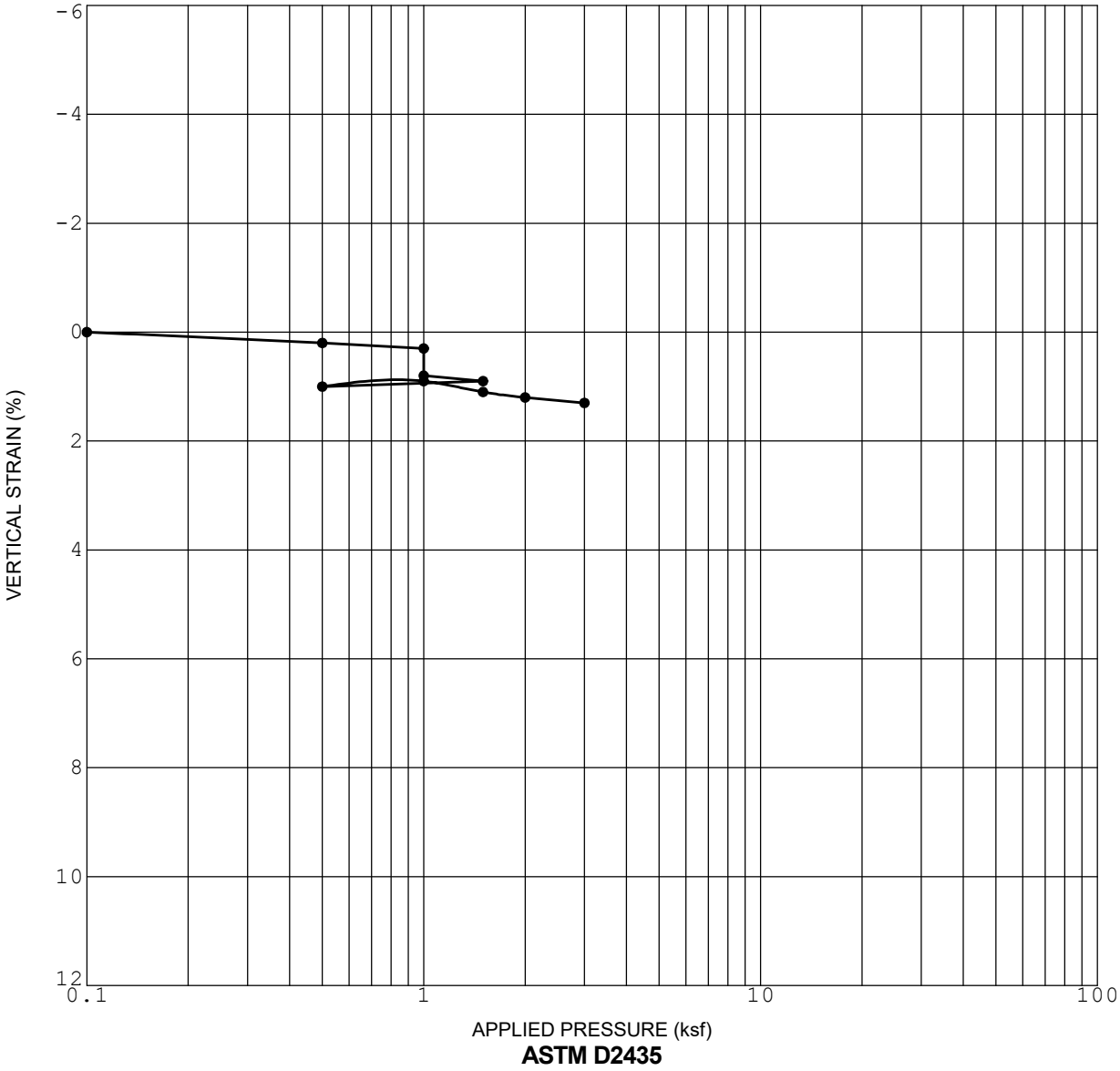
G1710-32-04.GPJ

Figure B-7

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. SB2-4



ASTM D2435

Initial Dry Density (pcf)	113.4	**Initial Saturation (%)**	27.9
Initial Water Content (%)	4.9	**Sample Saturated at (ksf)**	1.0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

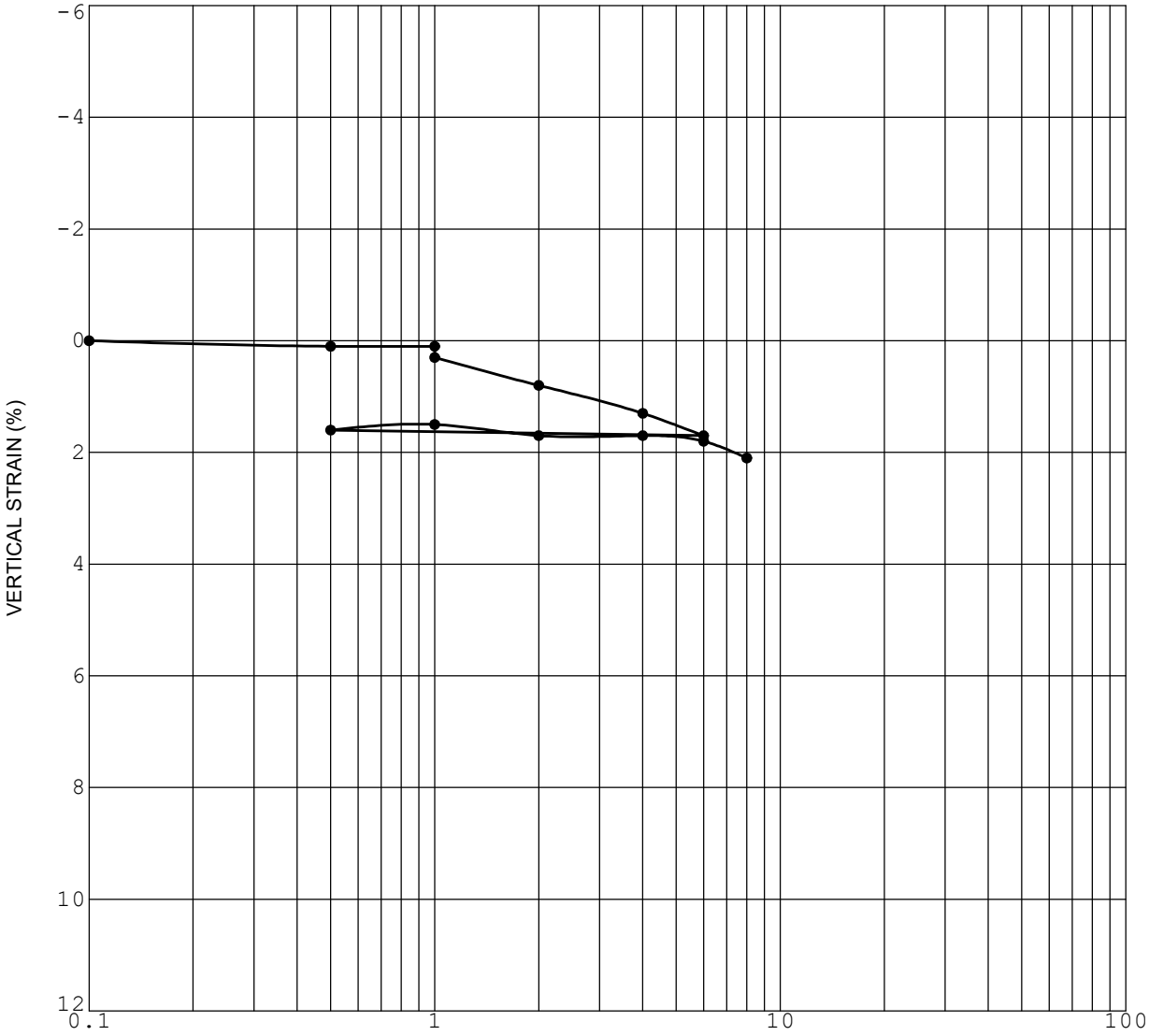
G1710-32-04.GPJ

Figure B-8

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. SB5-11



ASTM D2435

Initial Dry Density (pcf)	108.9	**Initial Saturation (%)**	28.5
Initial Water Content (%)	5.6	**Sample Saturated at (ksf)**	1.0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

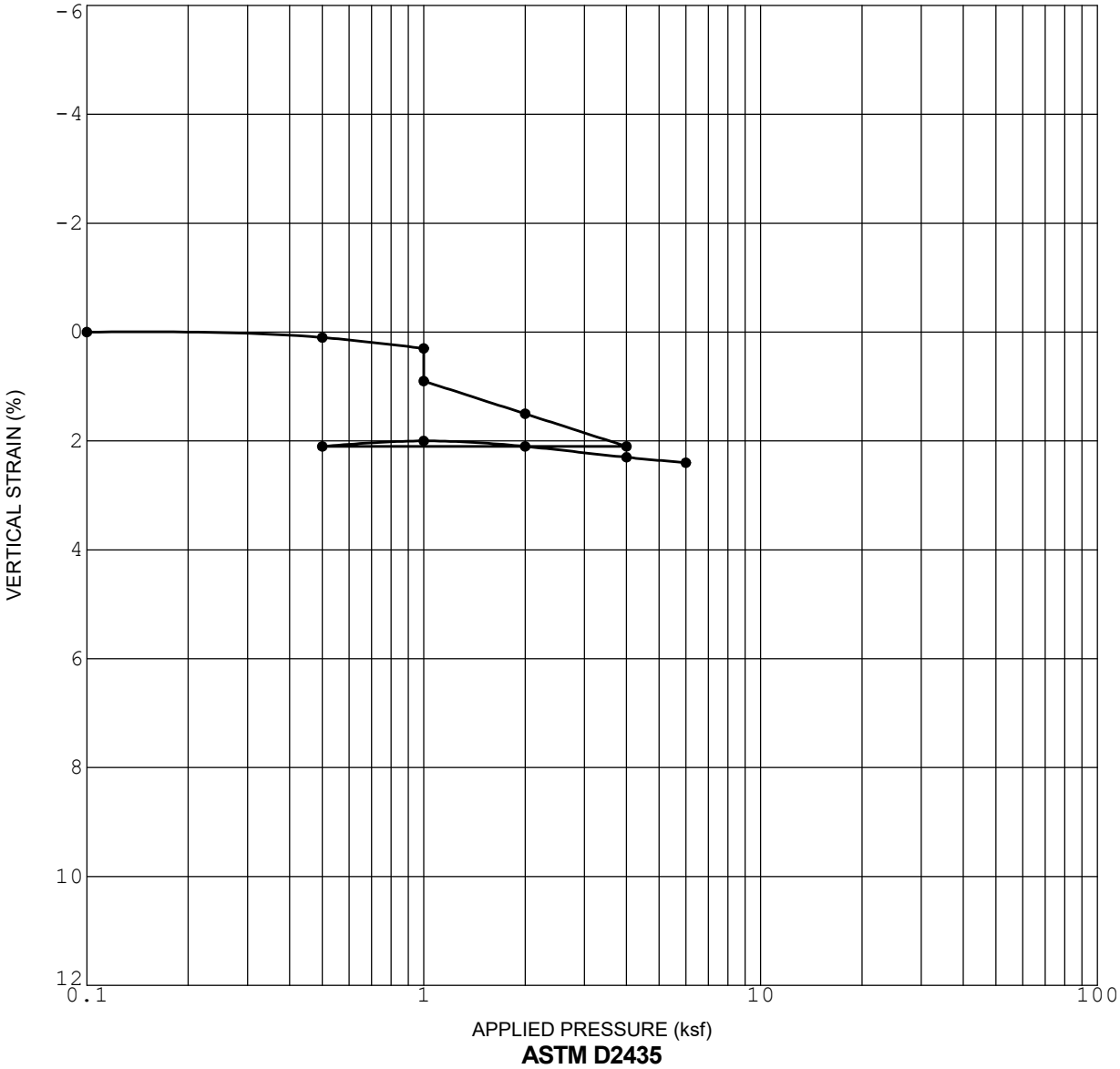
G1710-32-04.GPJ

Figure B-9

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. SB6-6



ASTM D2435

Initial Dry Density (pcf)	101.7	**Initial Saturation (%)**	9.6
Initial Water Content (%)	2.3	**Sample Saturated at (ksf)**	1.0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

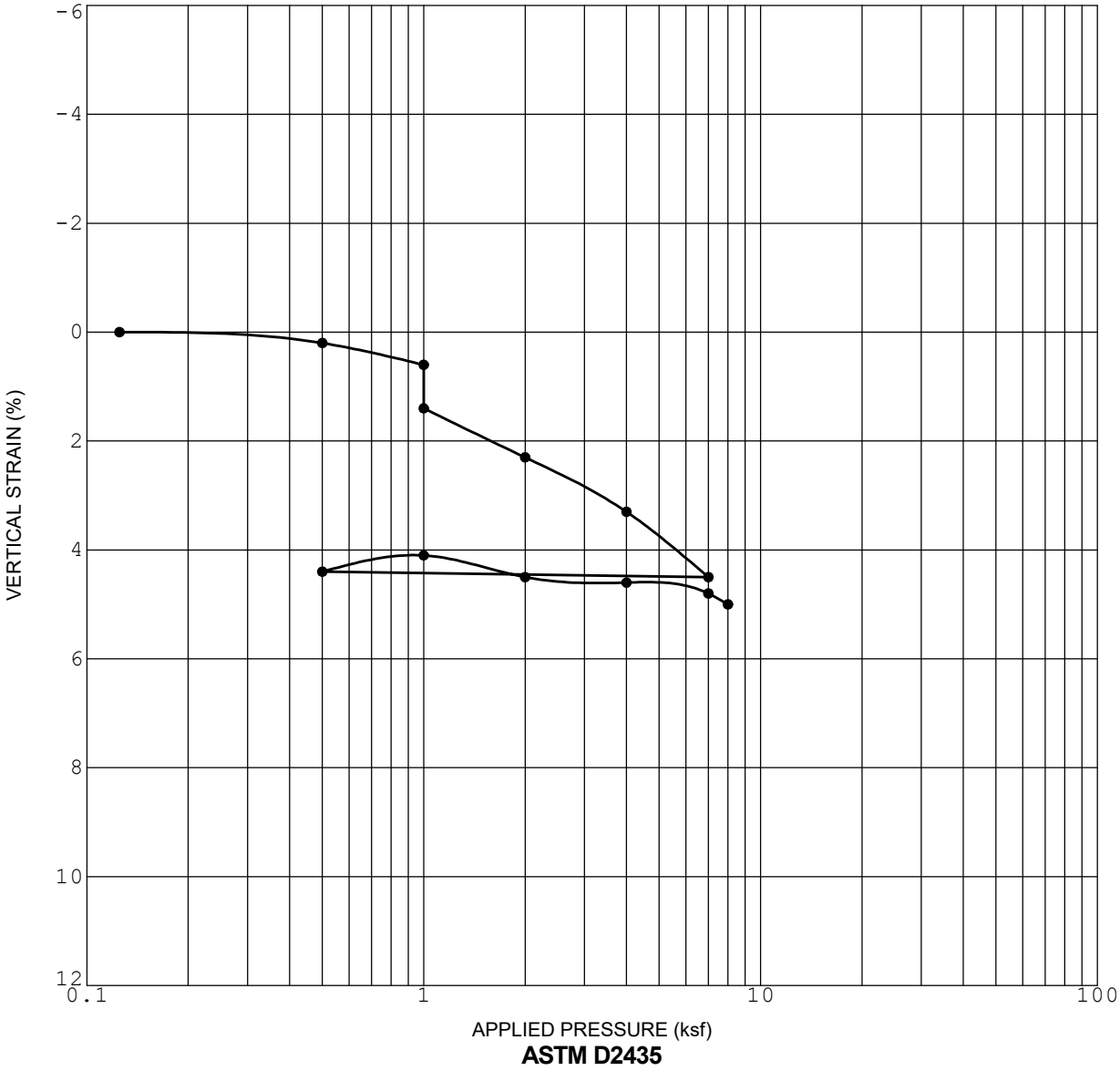
G1710-32-04.GPJ

Figure B-10

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. SB6-12



ASTM D2435

Initial Dry Density (pcf)	96.9	**Initial Saturation (%)**	18.9
Initial Water Content (%)	5.1	**Sample Saturated at (ksf)**	1.0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

G1710-32-04.GPJ

Figure B-11

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. SB10-6

ASTM D2435

Initial Dry Density (pcf)	104.2	**Initial Saturation (%)**	11.9
Initial Water Content (%)	2.6	**Sample Saturated at (ksf)**	0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

G1710-32-04.GPJ

Figure B-12

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. SB10-14

ASTM D2435

Initial Dry Density (pcf)	94.9	**Initial Saturation (%)**	87.0
Initial Water Content (%)	24.5	**Sample Saturated at (ksf)**	1.0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

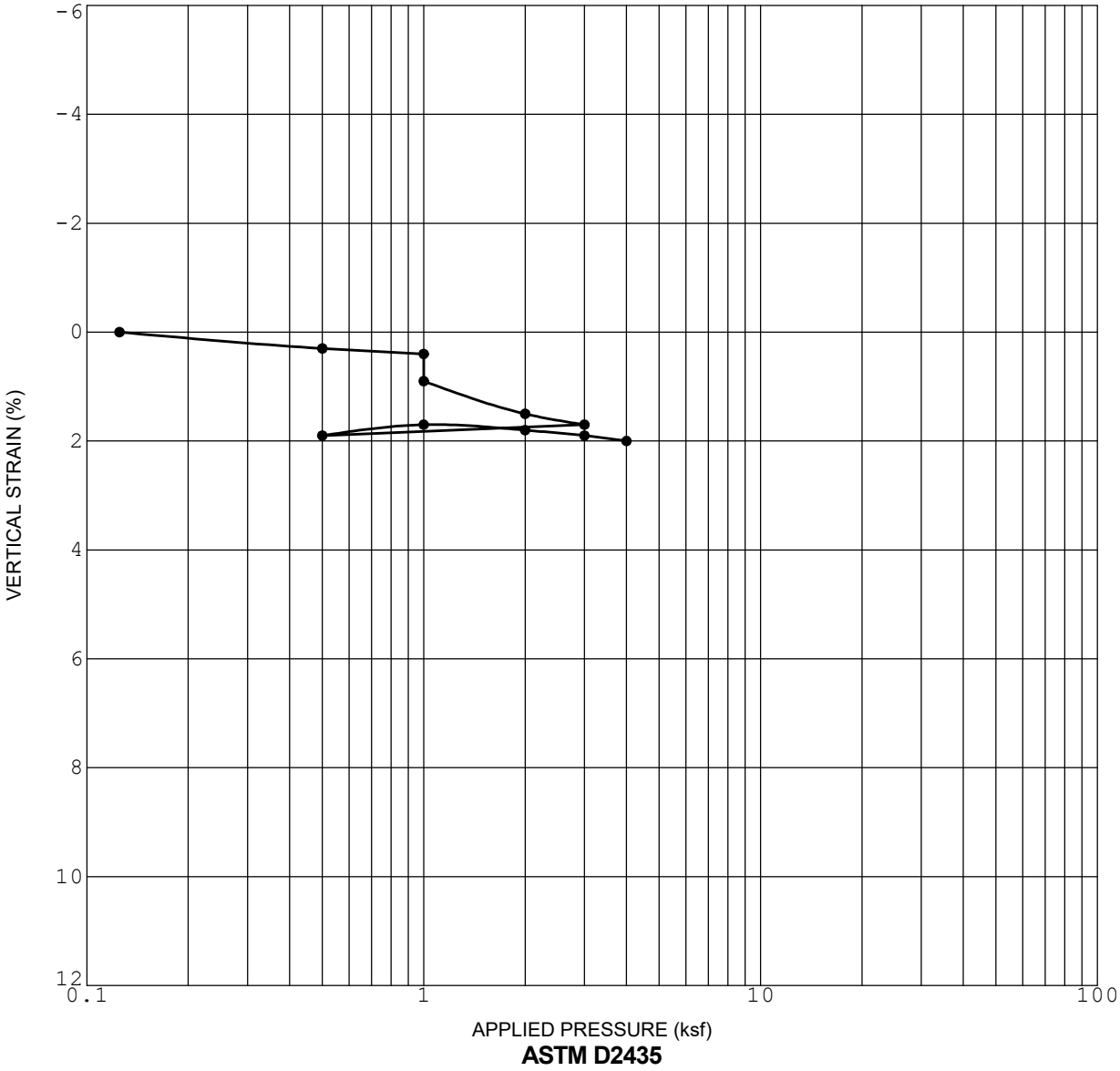
G1710-32-04.GPJ

Figure B-13

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. SB11-5



ASTM D2435

Initial Dry Density (pcf)	106.1	**Initial Saturation (%)**	23.0
Initial Water Content (%)	4.9	**Sample Saturated at (ksf)**	1.0

CONSOLIDATION CURVE

MARISOL

DEL MAR, CALIFORNIA

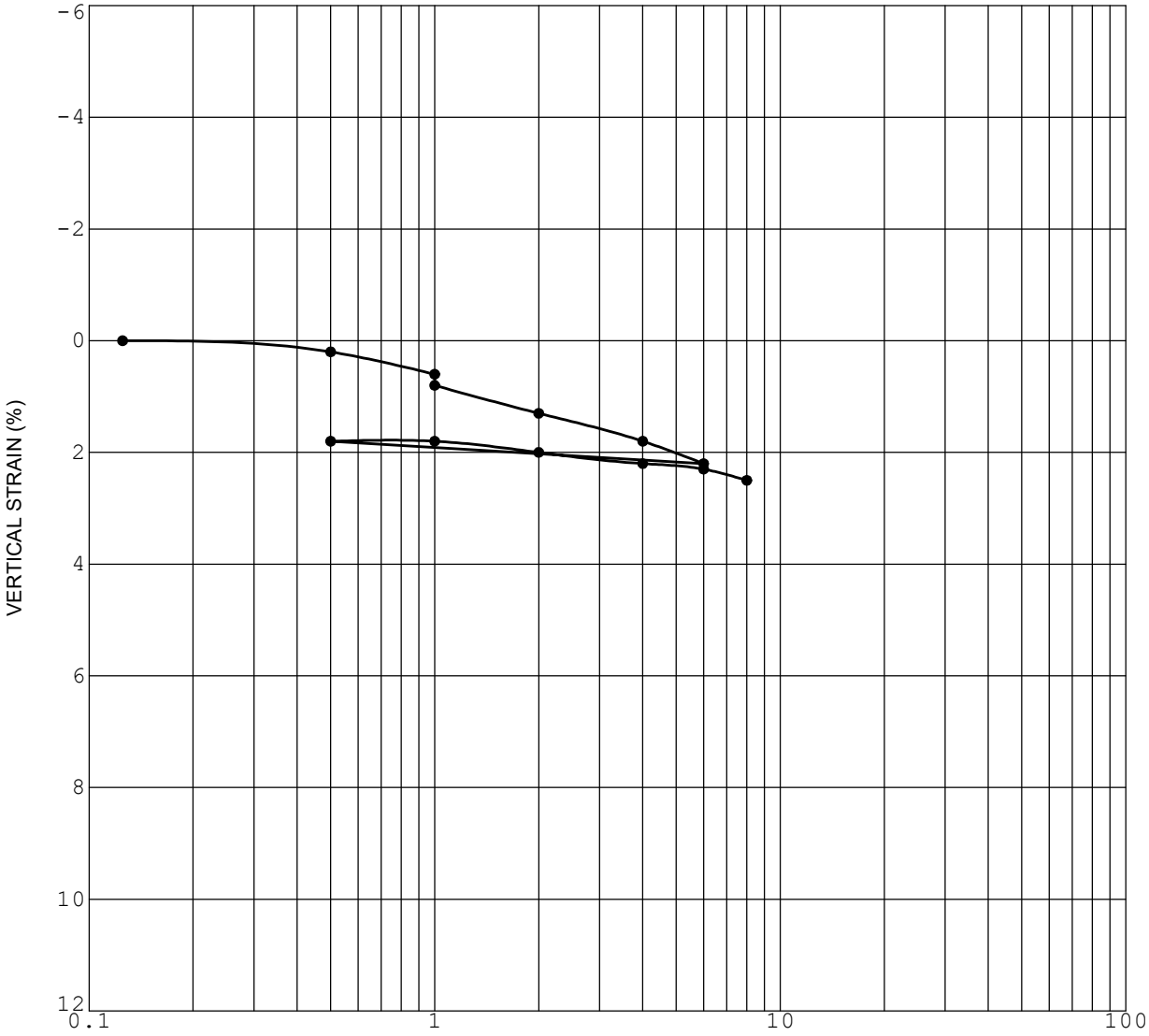
G1710-32-04.GPJ

Figure B-14

GEOCON

PROJECT NO. G1710-32-04

SAMPLE NO. SB11-11



ASTM D2435

Initial Dry Density (pcf)	112.2	**Initial Saturation (%)**	59.7
Initial Water Content (%)	10.8	**Sample Saturated at (ksf)**	1.0

CONSOLIDATION CURVE

MARISOL

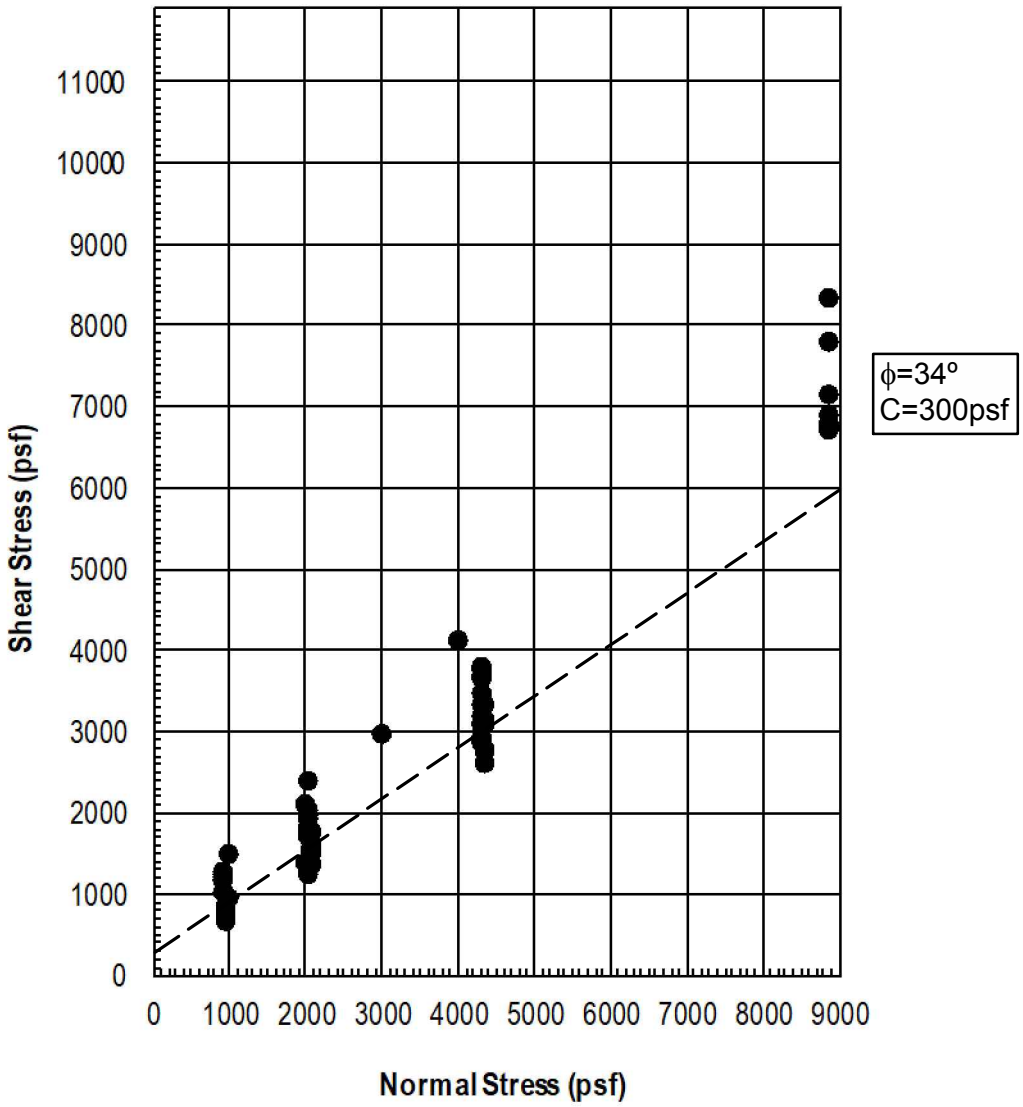
DEL MAR, CALIFORNIA

G1710-32-04.GPJ

Figure B-15

GEOCON

The Resort at Del Mar
Qop6 (SM-SP) - Peak



COMPOSITE DIRECT SHEAR TEST RESULTS

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

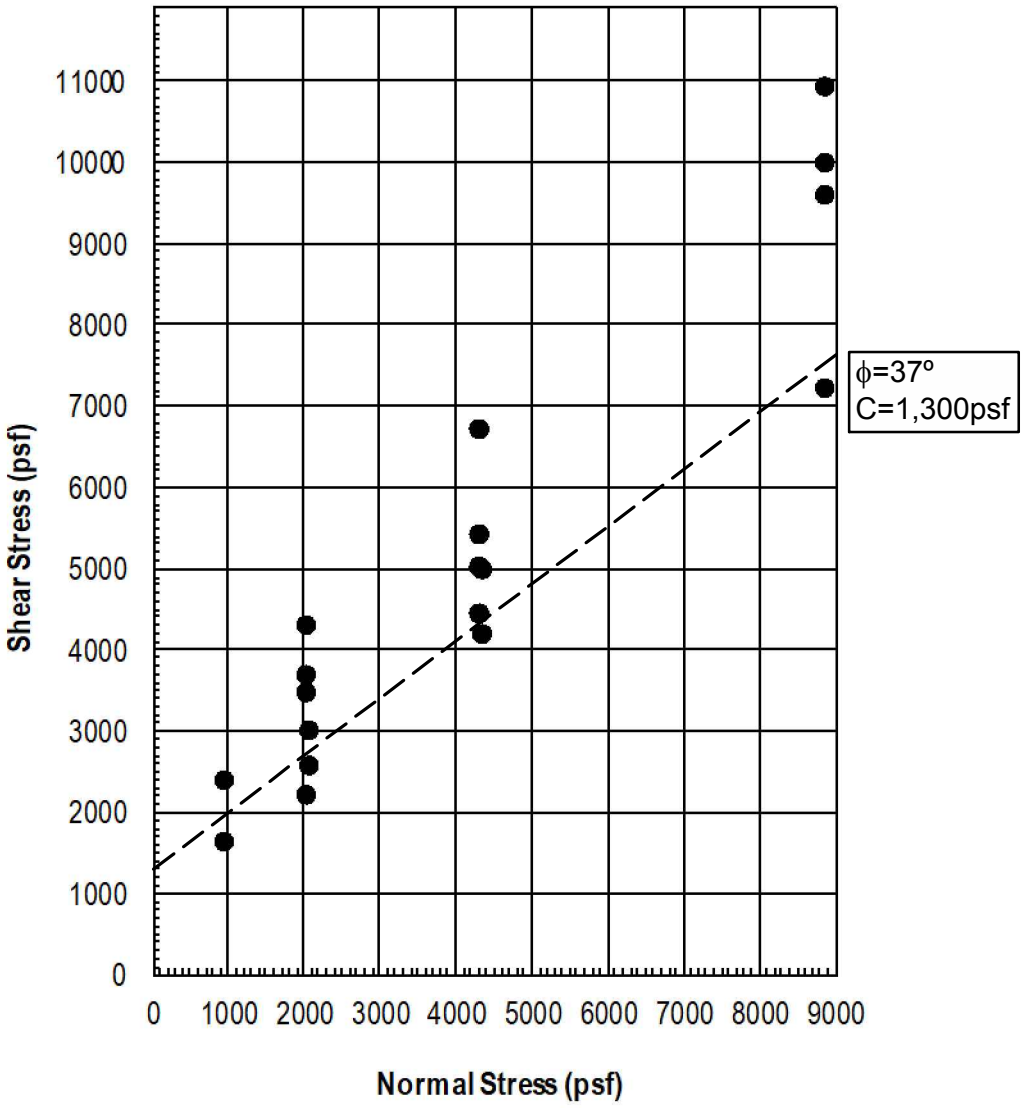
MARISOL
DEL MAR, CALIFORNIA

DE / RA		DSK/GTYPD

DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. B-16

Plotted:09/09/2019 1:55PM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\G1710-32-04 DirectShearTestResults - Standard\G1710-32-04 DirectShearTestResults.dwg

The Resort at Del Mar
Torrey Sandstone Tt- (SM) - Peak



COMPOSITE DIRECT SHEAR TEST RESULTS

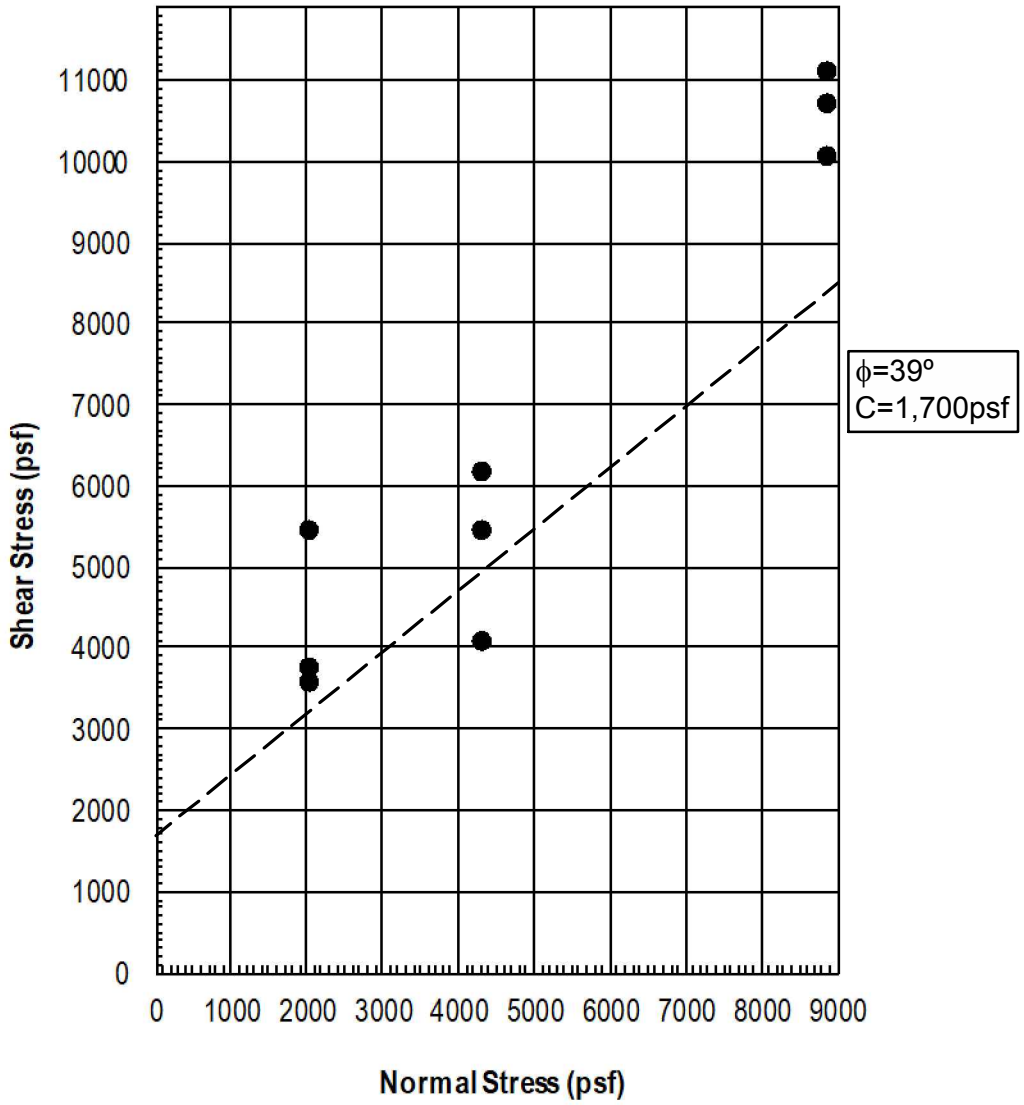
GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

MARISOL
DEL MAR, CALIFORNIA

DE / RA		DSK/GTYPD	DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. B-17

Plotted:09/09/2019 1:55PM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\G1710-32-04 DirectShearTestResults - Standard\G1710-32-04 DirectShearTestResults.dwg

The Resort at Del Mar
Delmar Formation Td- (SM) - Peak



COMPOSITE DIRECT SHEAR TEST RESULTS

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

MARISOL
DEL MAR, CALIFORNIA

DE / RA		DSK/GTYPD	DATE 09 - 06 - 2019	PROJECT NO. G1710 - 32 - 04	FIG. B-18

Plotted:09/09/2019 1:55PM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G1710-32-04 Marisol\G1710-32-04 DirectShearTestResults - Standard\G1710-32-04 DirectShearTestResults.dwg

APPENDIX C

APPENDIX C

SLOPE STABILITY ANALYSES

FOR

MARISOL
DEL MAR, CALIFORNIA

PROJECT NO. G1710-32-04

The Resort at Del Mar
Project No. G1710-32-04
Section A-A'
Name: AAc0.gsz
Date: 08/29/2019 Time: 08:36:06 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

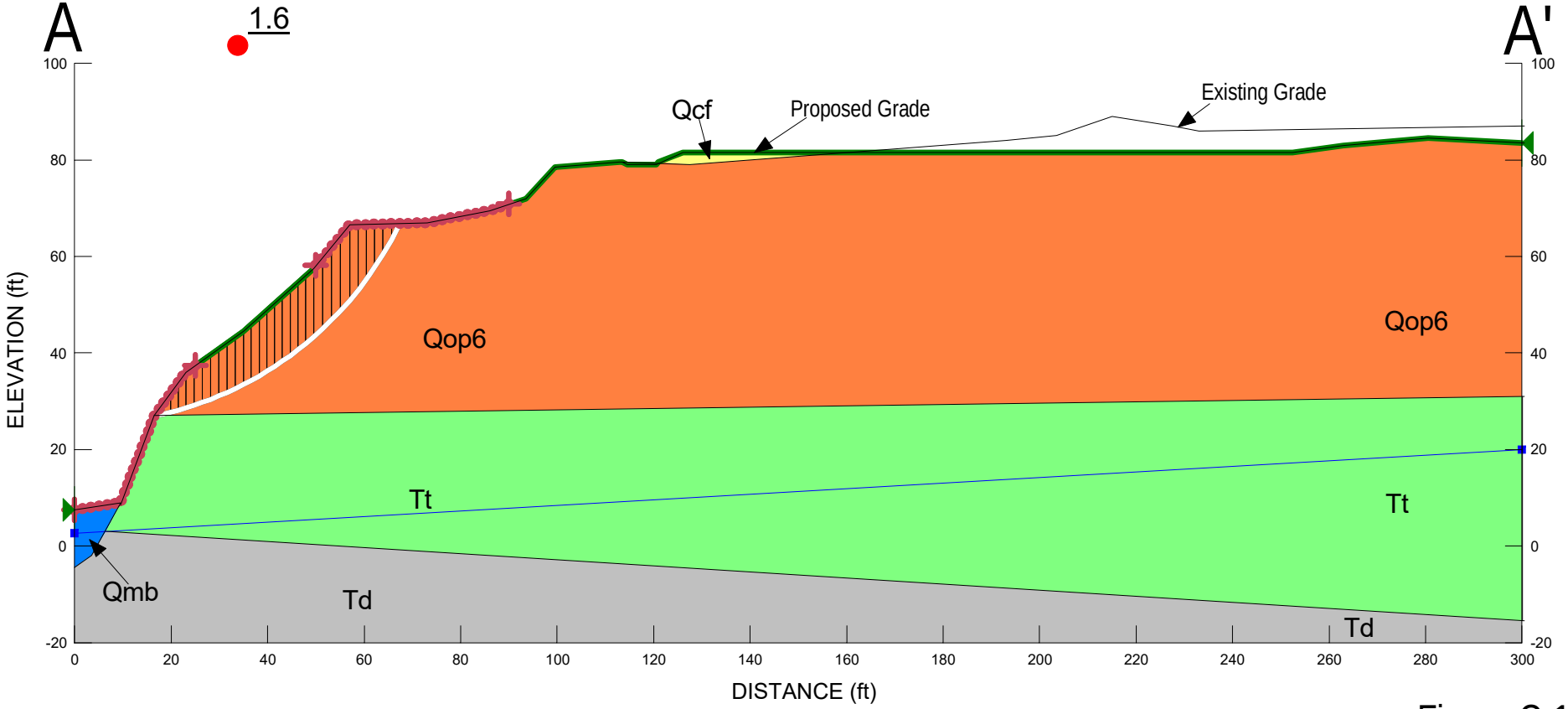


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Figure C-1

The Resort at Del Mar
Project No. G1710-32-04
Section B-B'
Name: BBc0.gsz
Date: 08/29/2019 Time: 08:57:56 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

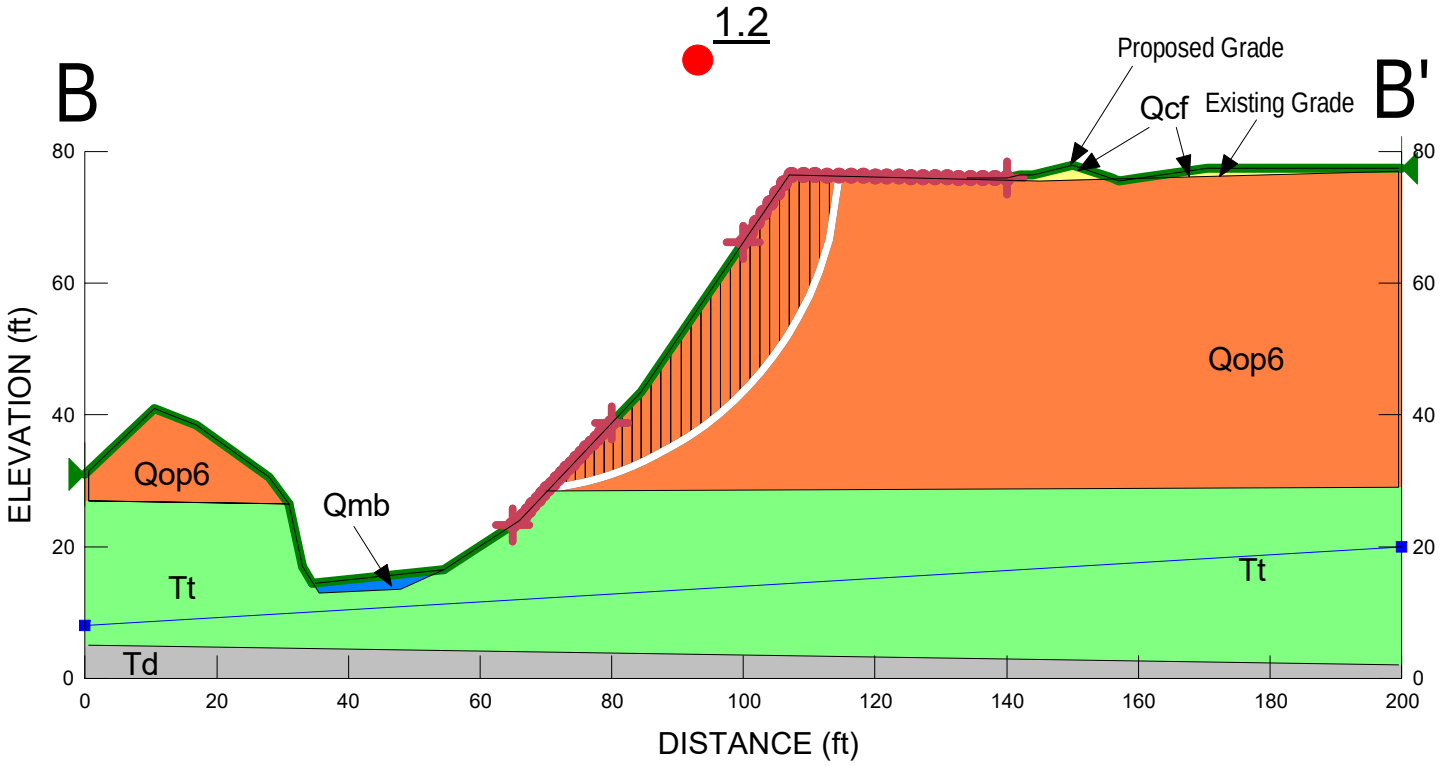

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Figure C-2

The Resort at Del Mar
Project No. G1710-32-04
Section B-B'
Name: BBc1.gsz
Date: 08/29/2019 Time: 02:11:58 PM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

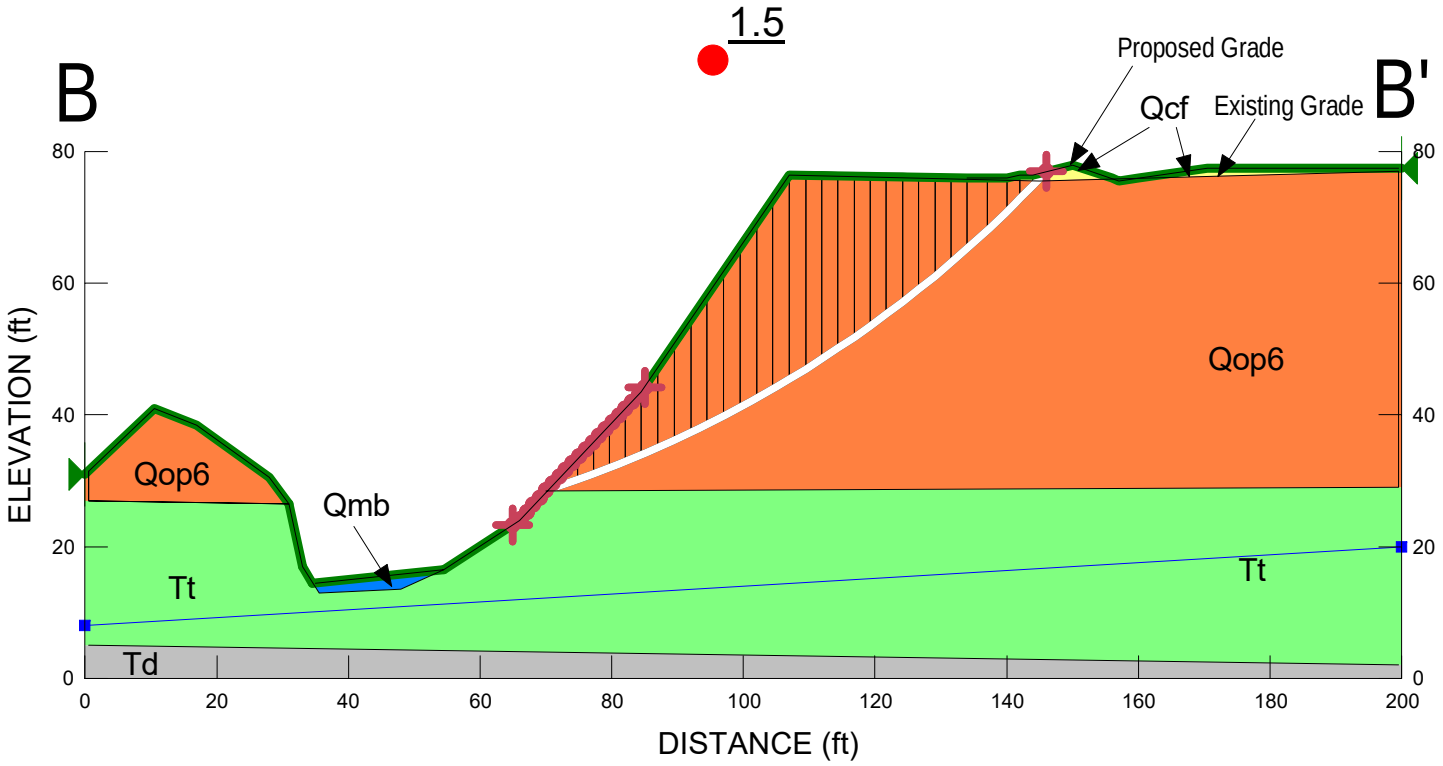

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Figure C-3

The Resort at Del Mar
Project No. G1710-32-04
Section C-C'
Name: CCc0.gsz
Date: 08/29/2019 Time: 02:35:45 PM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

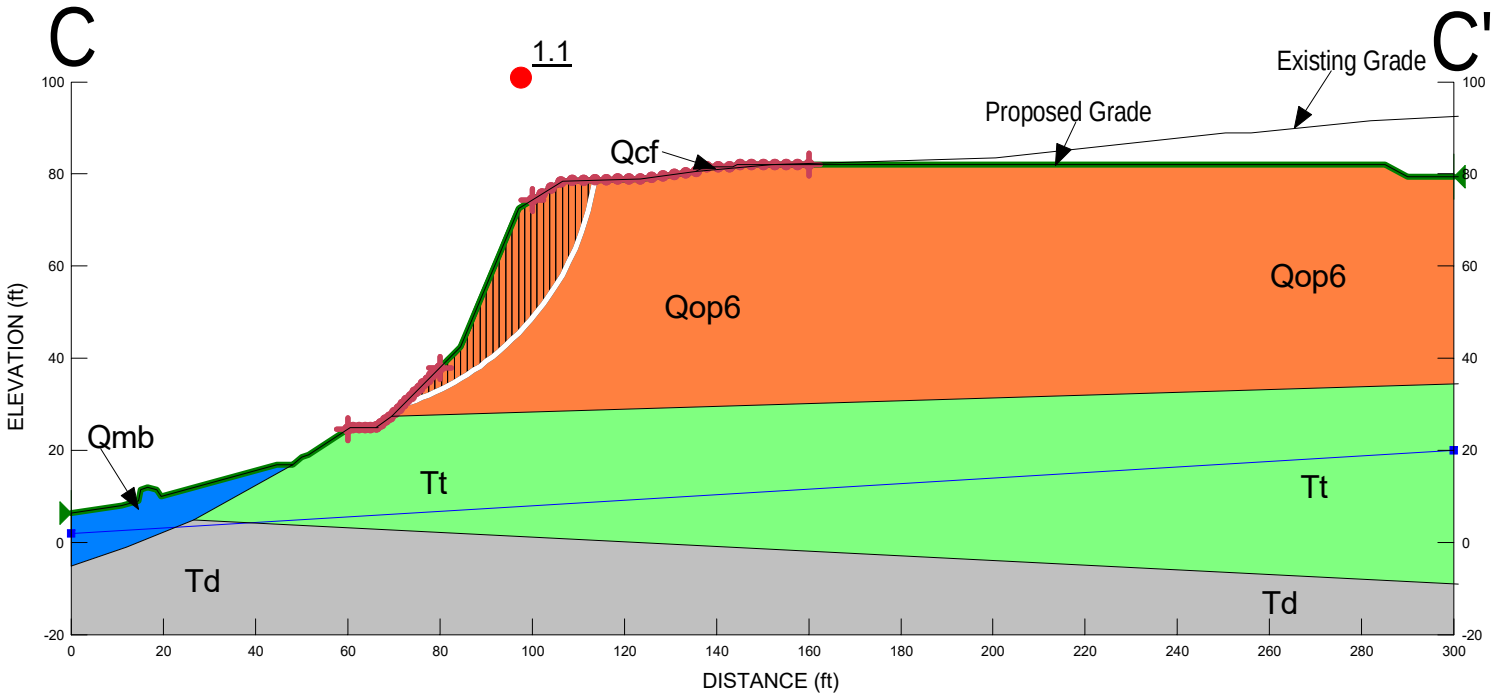

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Figure C-4

The Resort at Del Mar
Project No. G1710-32-04
Section C-C'
Name: CCc1.gsz
Date: 08/29/2019 Time: 02:37:36 PM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

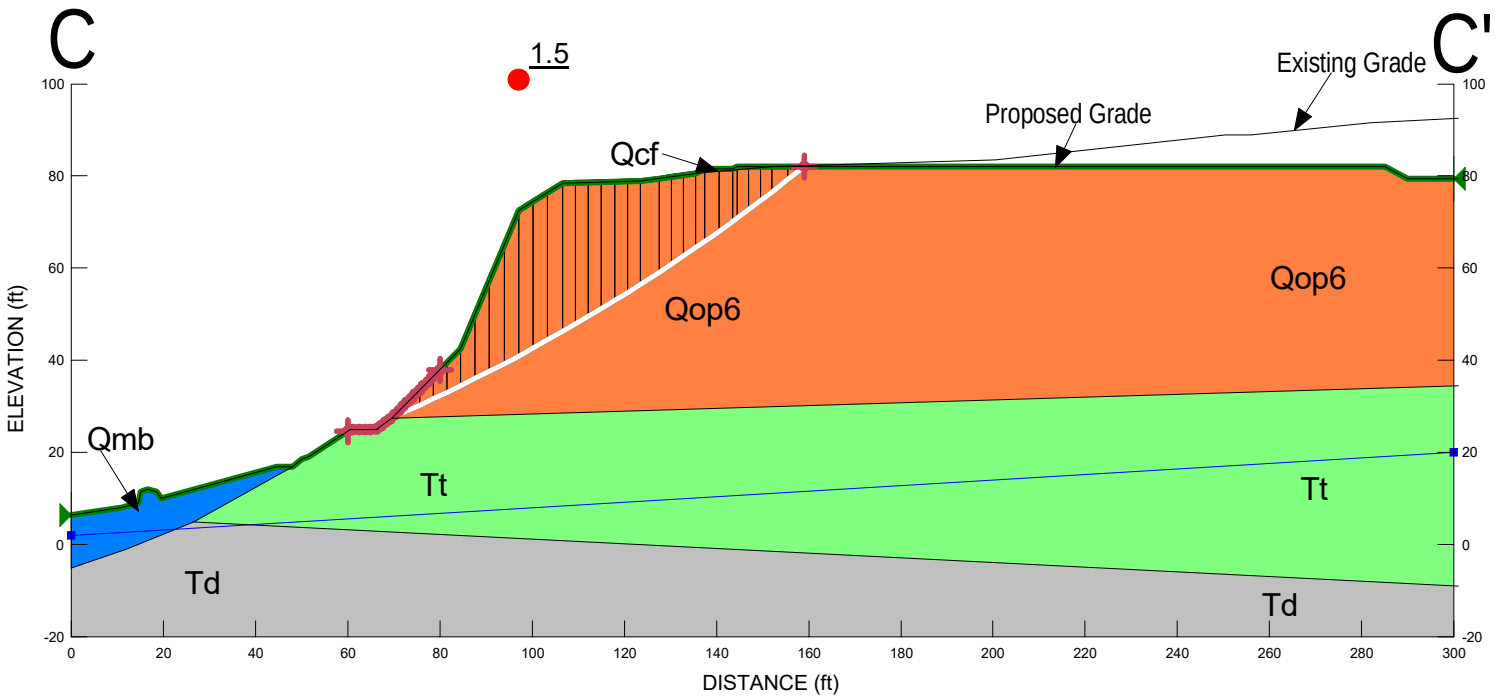

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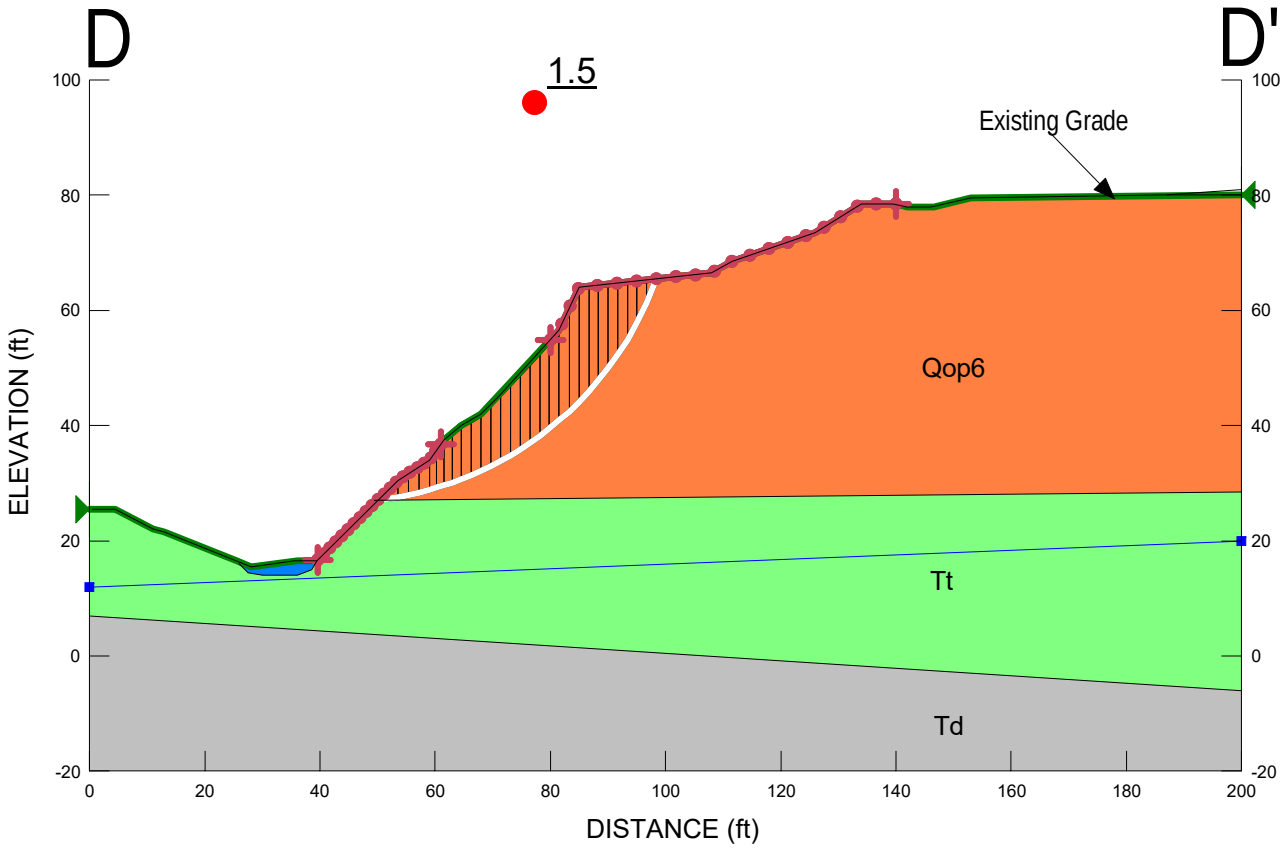
Figure C-5

The Resort at Del Mar
Project No. G1710-32-04
Section D-D'
Name: DDc0.gsz
Date: 08/29/2019 Time: 02:44:20 PM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37



The Resort at Del Mar
Project No. G1710-32-04
Section E-E'
Name: EEc0.gsz
Date: 08/29/2019 Time: 02:50:30 PM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

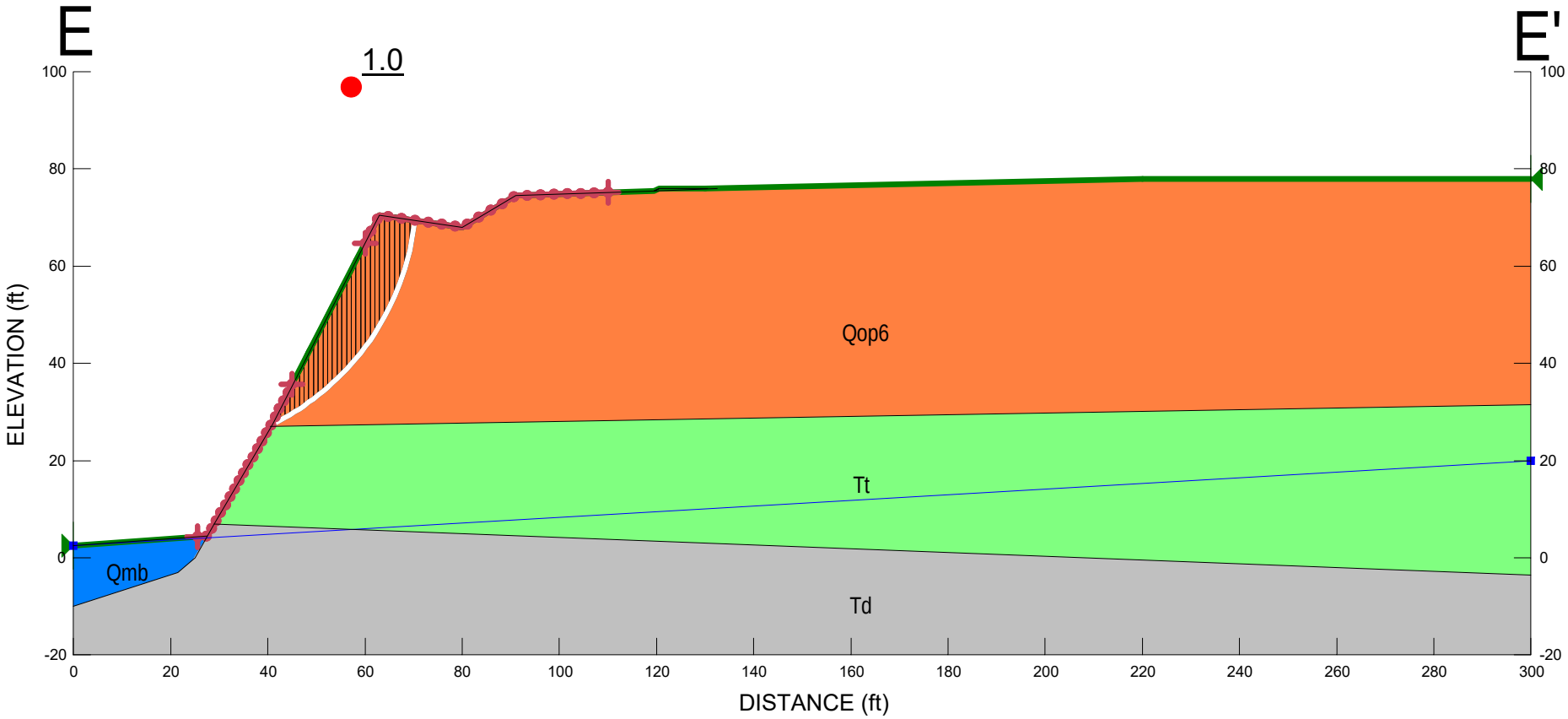


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Figure C-7

The Resort at Del Mar
Project No. G1710-32-04
Section E-E'
Name: EEc1.gsz
Date: 08/29/2019 Time: 02:46:46 PM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

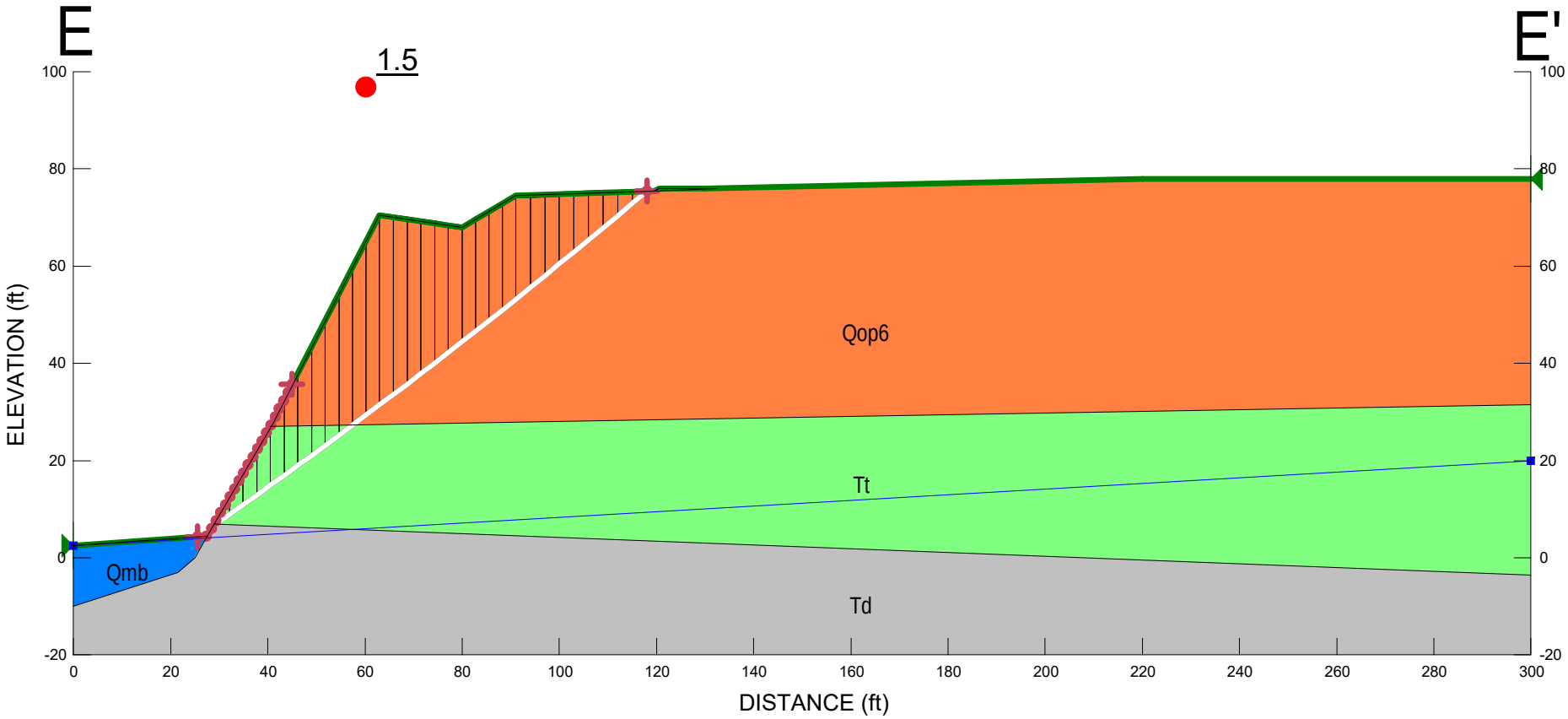

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Figure C-8

The Resort at Del Mar
Project No. G1710-32-04
Section F-F'
Name: FFc0.gsz
Date: 08/30/2019 Time: 07:33:51 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qbp - Brush Pile	100	0	2
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

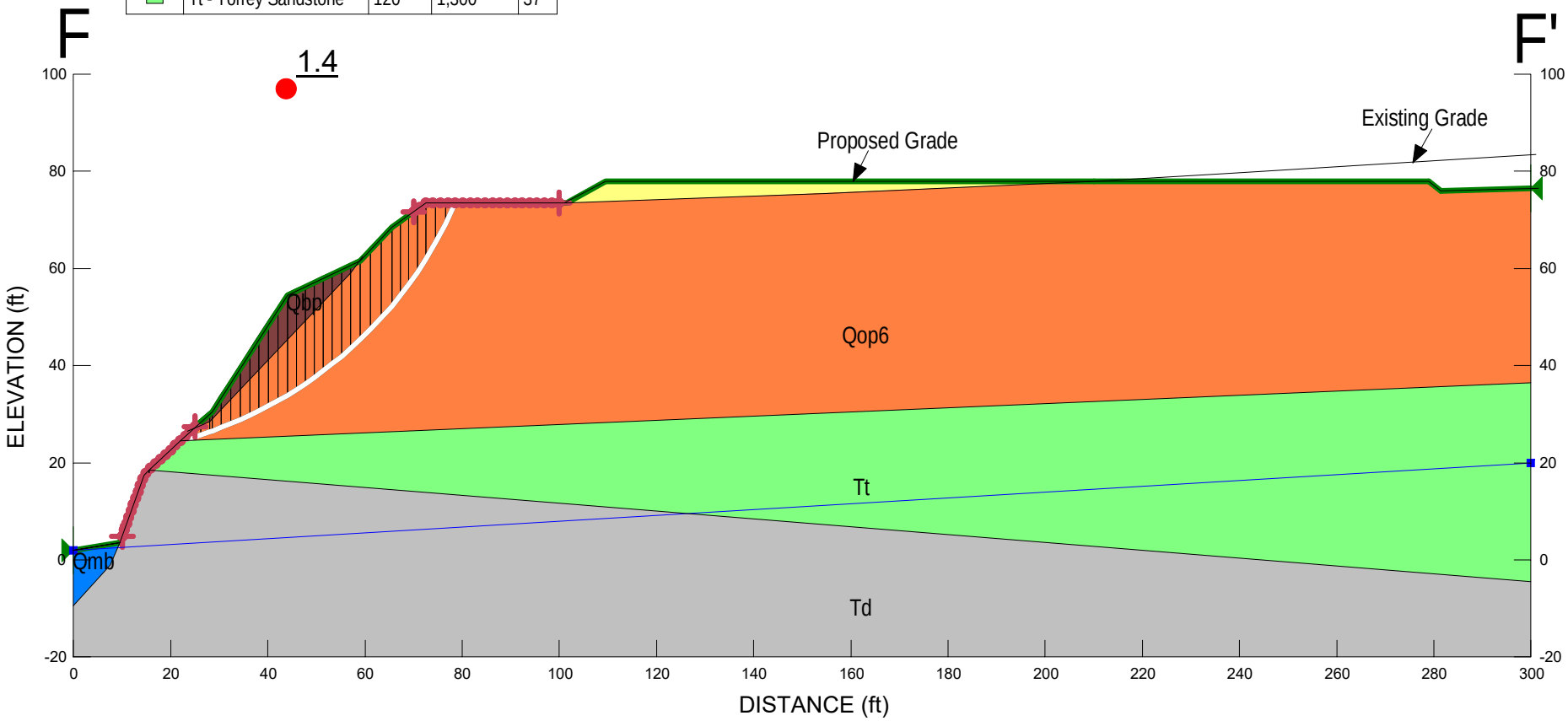

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Figure C-9

The Resort at Del Mar
Project No. G1710-32-04
Section F-F'
Name: FFc1.gsz
Date: 08/27/2019 Time: 06:59:20 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qbp - Brush Pile	100	0	2
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

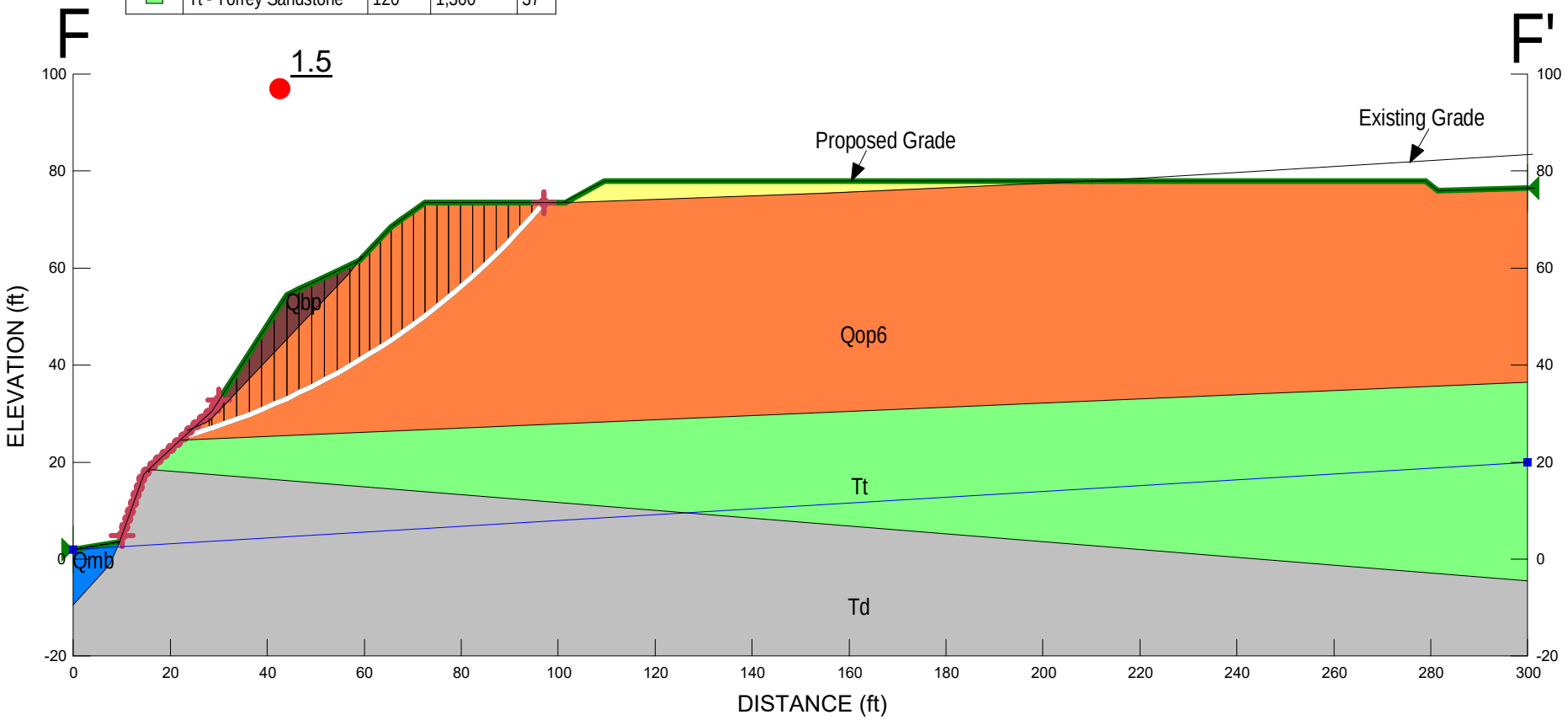

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Figure C-10

The Resort at Del Mar
Project No. G1710-32-04
Section G-G'
Name: GGc0.gsz
Date: 08/30/2019 Time: 07:38:47 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

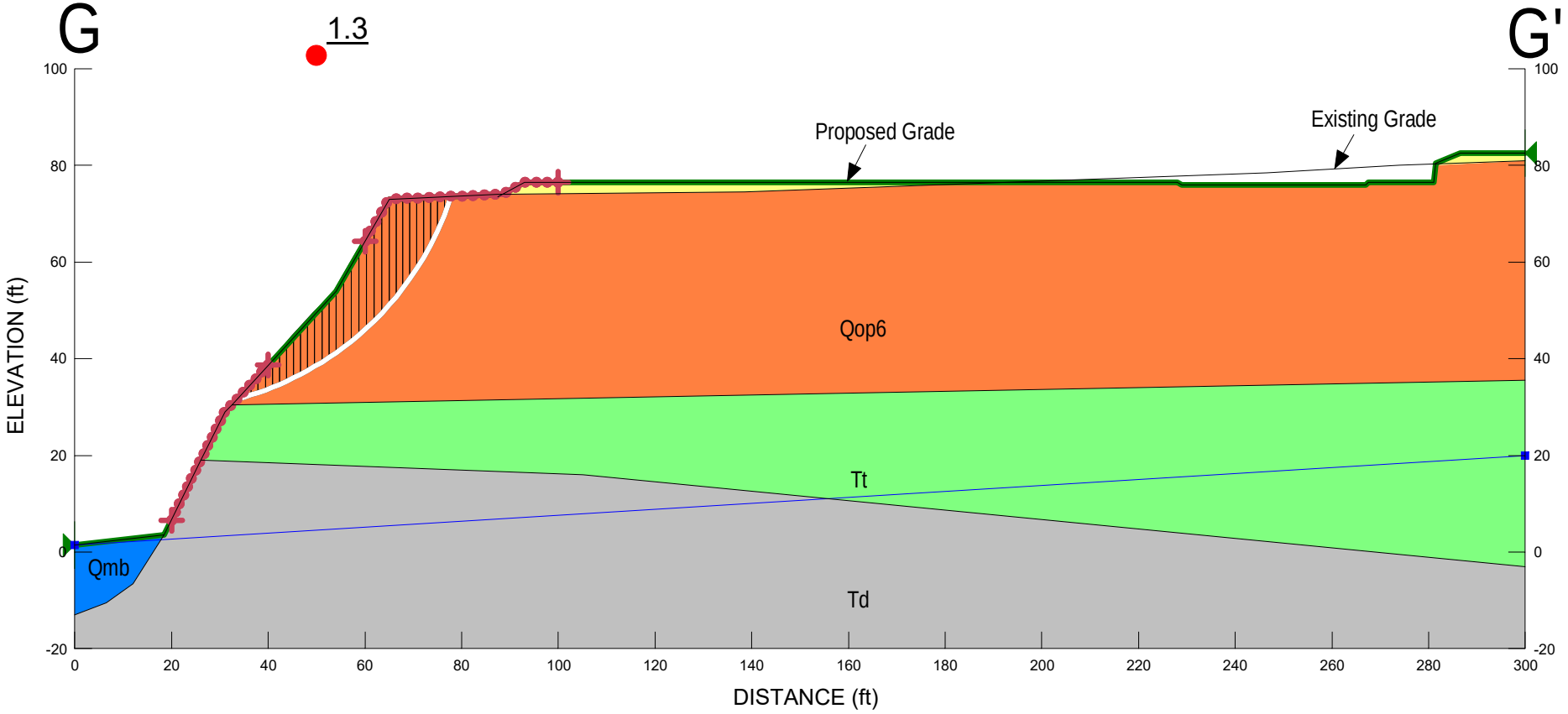

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Figure C-11

The Resort at Del Mar
Project No. G1710-32-04
Section G-G'
Name: GGc1.gsz
Date: 08/27/2019 Time: 07:27:39 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

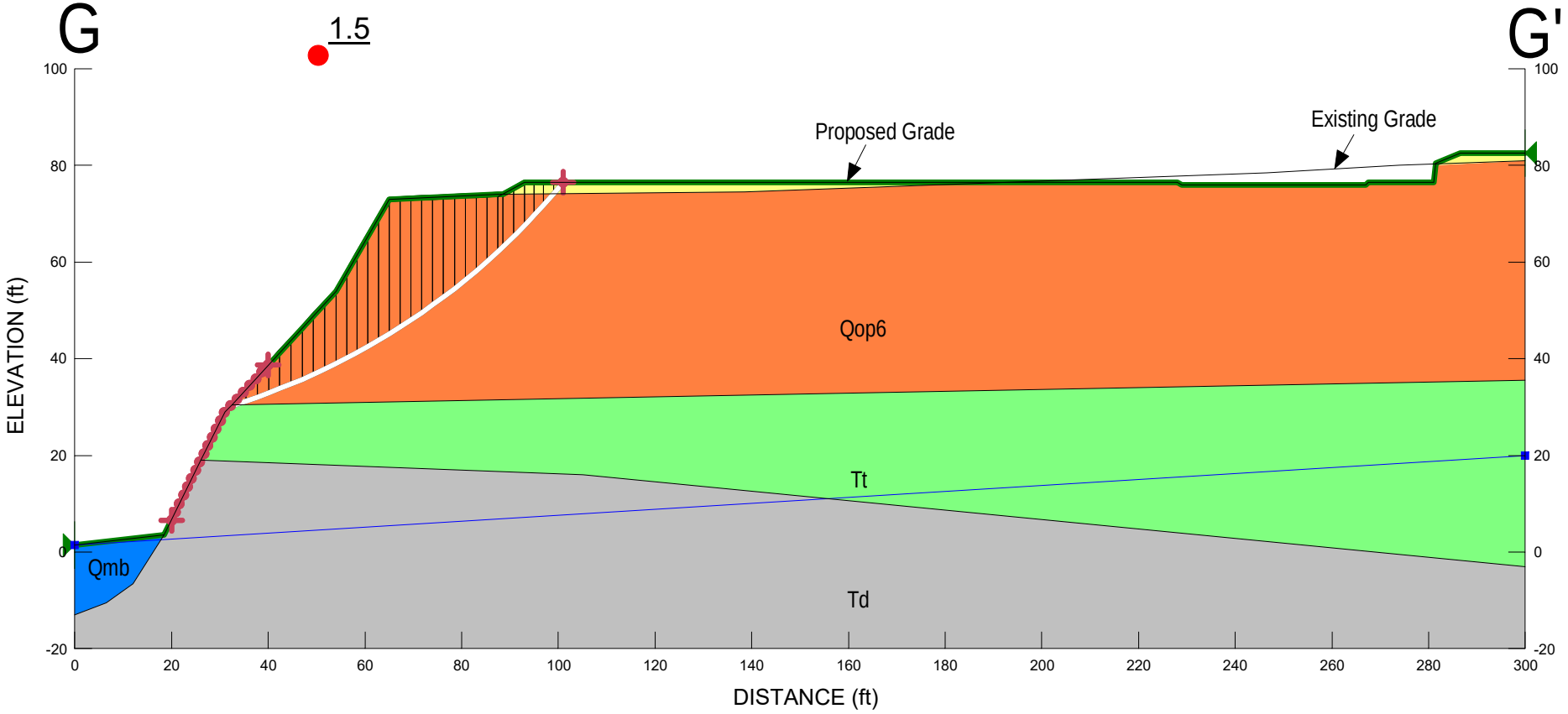

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Figure C-12

The Resort at Del Mar
Project No. G1710-32-04
Section H-H'
Name: HHc0.gsz
Date: 08/30/2019 Time: 07:43:35 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

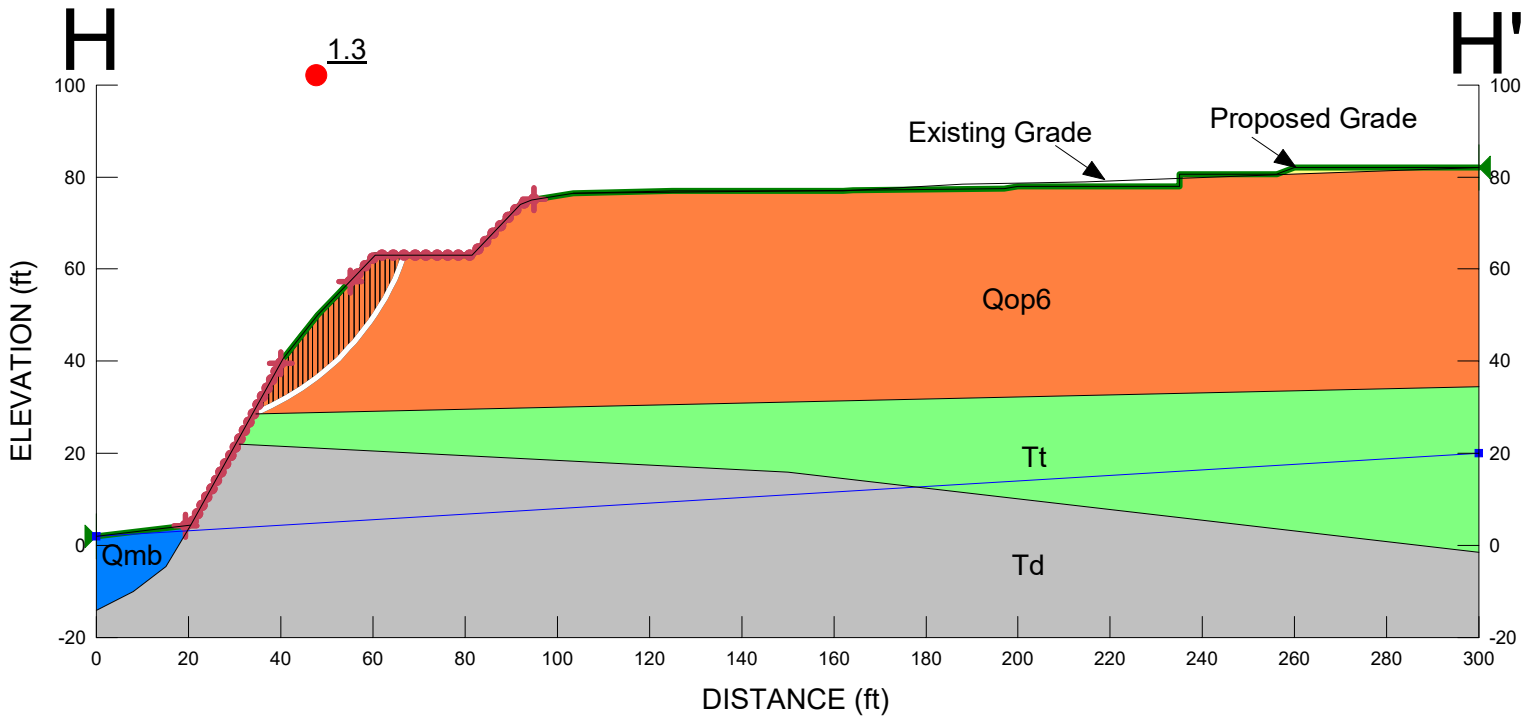

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Figure C-13

The Resort at Del Mar
Project No. G1710-32-04
Section H-H'
Name: HHc1.gsz
Date: 08/27/2019 Time: 07:48:52 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

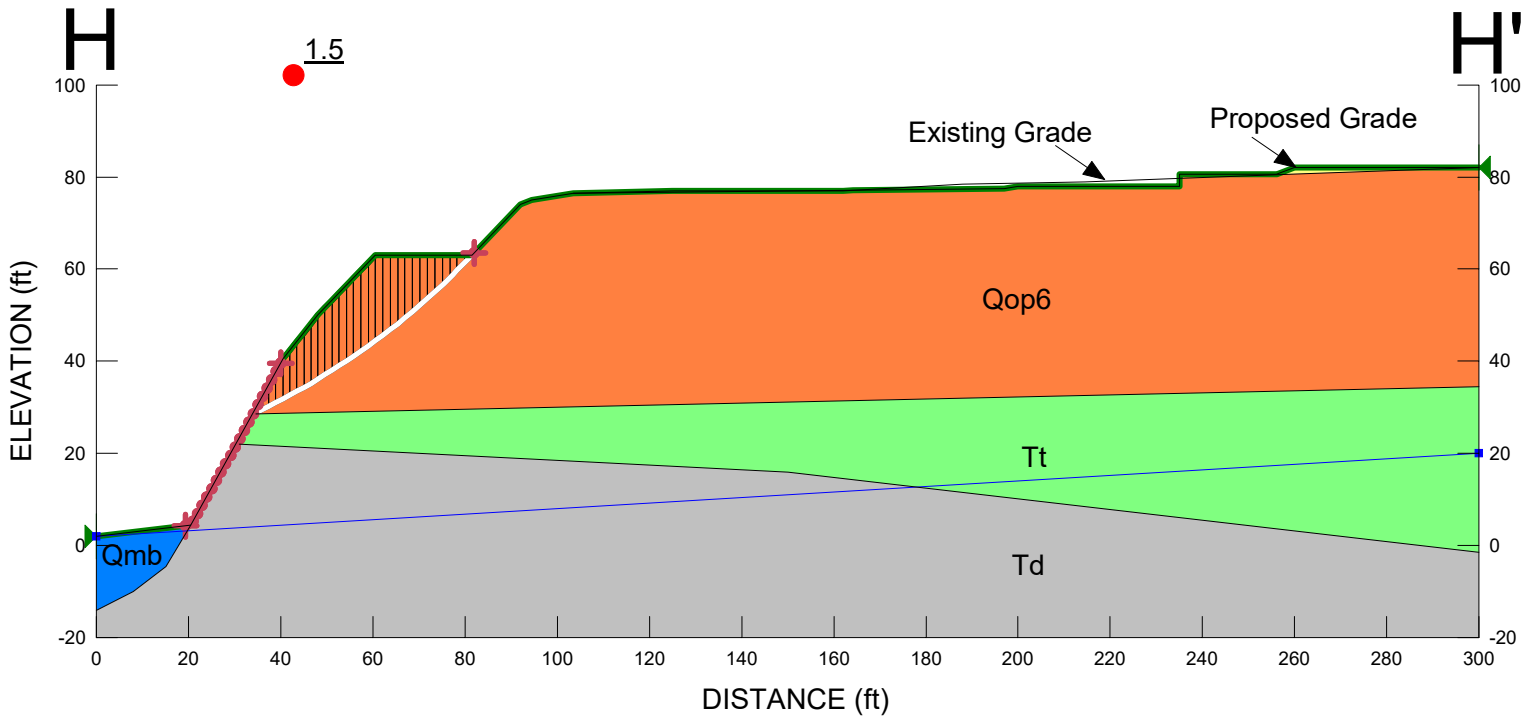

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Figure C-14

The Resort at Del Mar
Project No. G1710-32-04
Section I-I'
Name: IIc0.gsz
Date: 08/30/2019 Time: 07:49:29 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

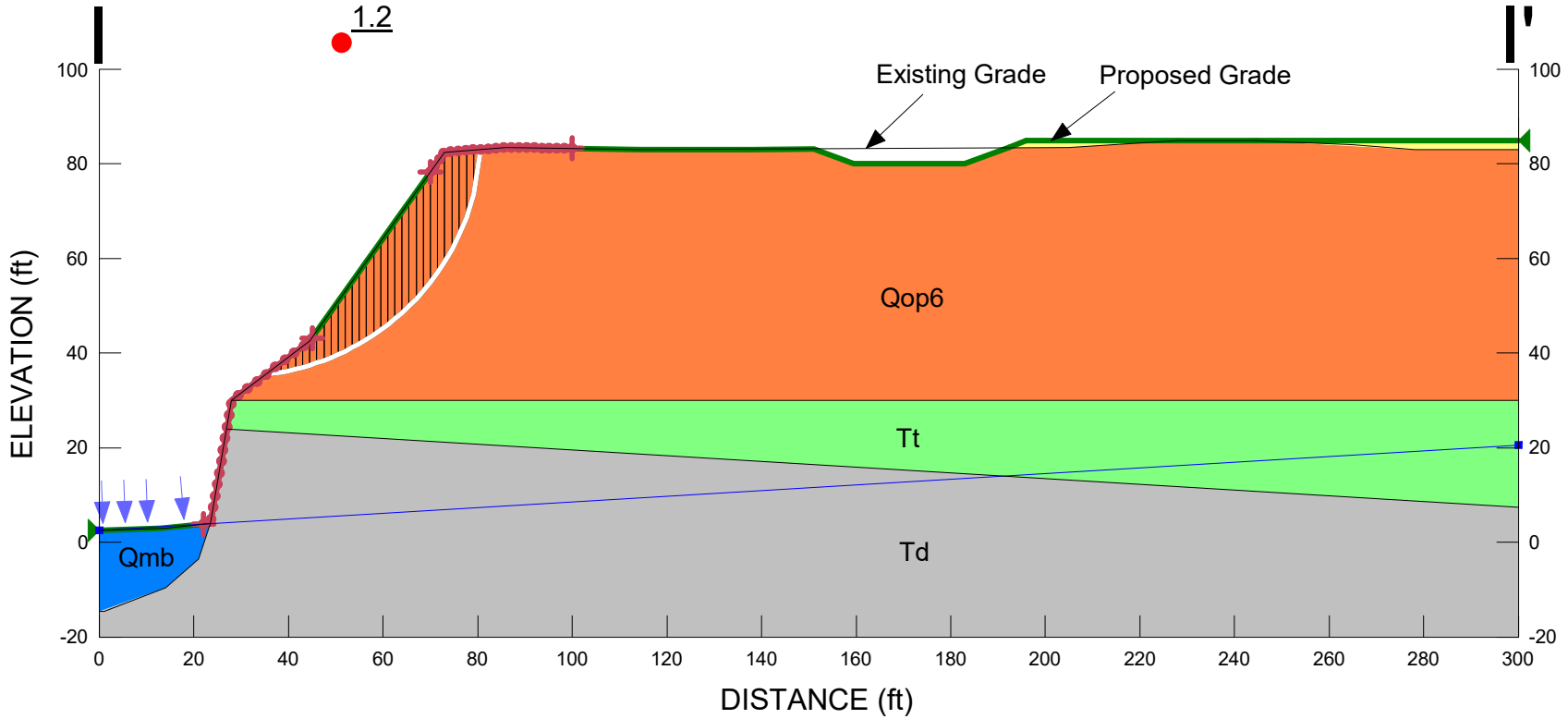

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Figure C-15

The Resort at Del Mar
Project No. G1710-32-04
Section I-I'
Name: IIc1.gsz
Date: 08/30/2019 Time: 07:52:38 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

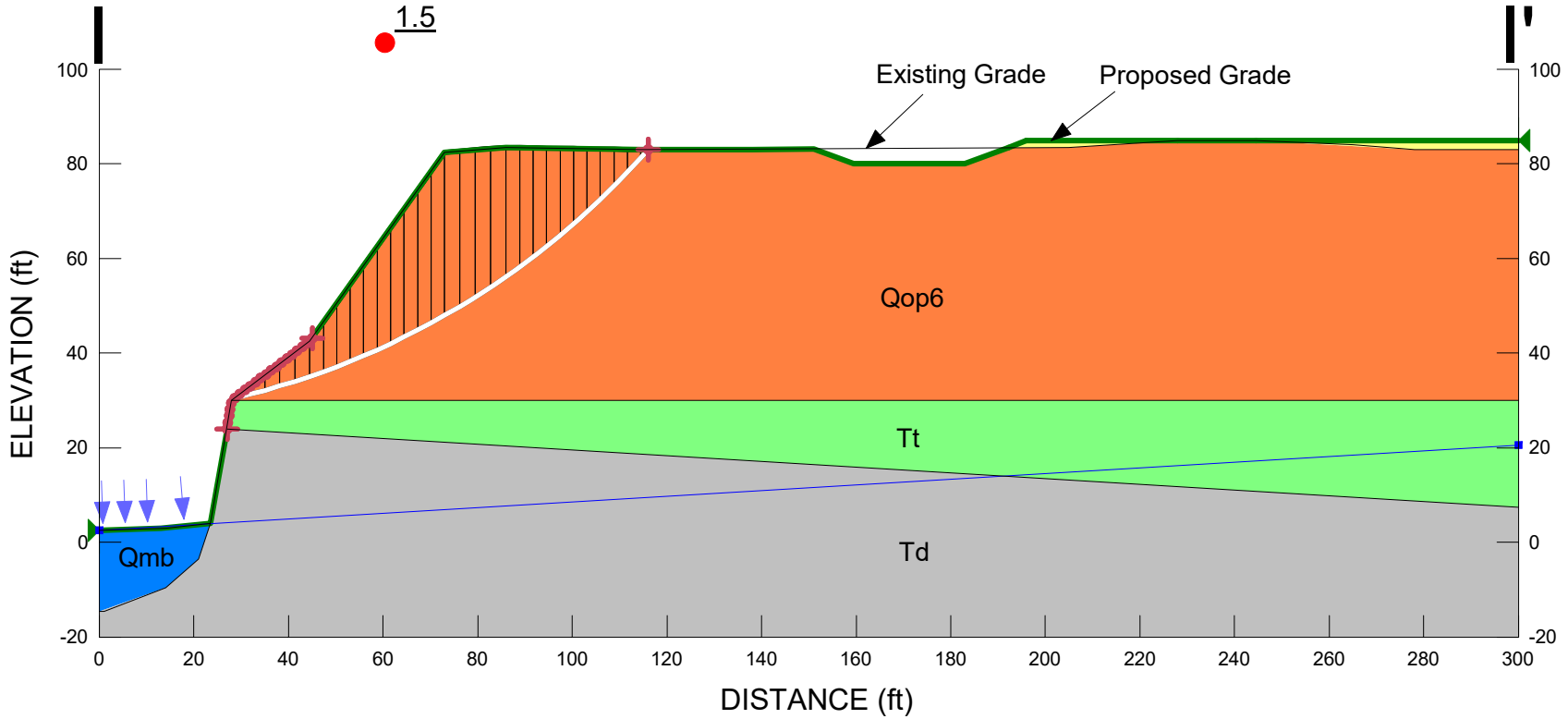

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Figure C-16

The Resort at Del Mar
Project No. G1710-32-04
Section J-J'
Name: JJc0.gsz
Date: 08/30/2019 Time: 07:59:24 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

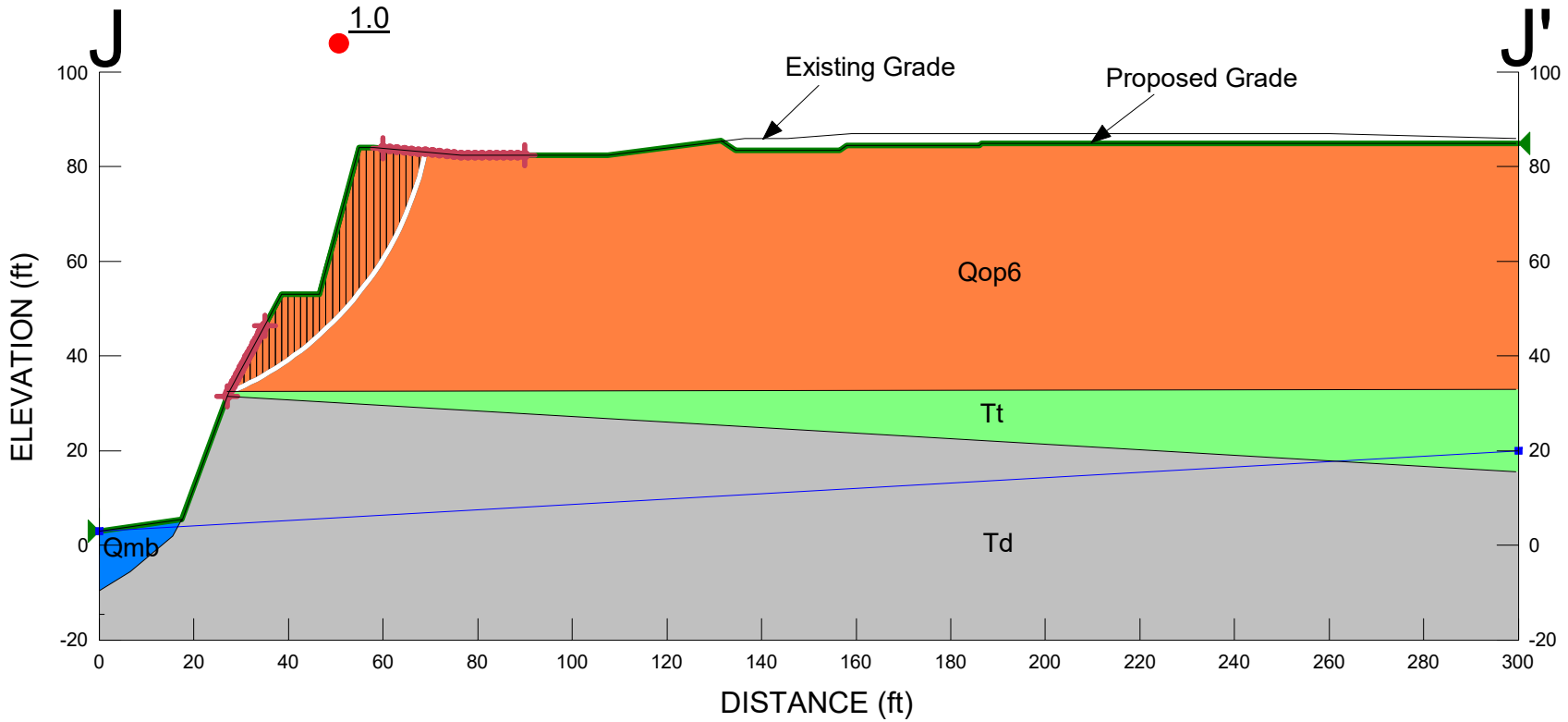

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Figure C-17

The Resort at Del Mar
Project No. G1710-32-04
Section J-J'
Name: JJc1.gsz
Date: 08/30/2019 Time: 08:02:22 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

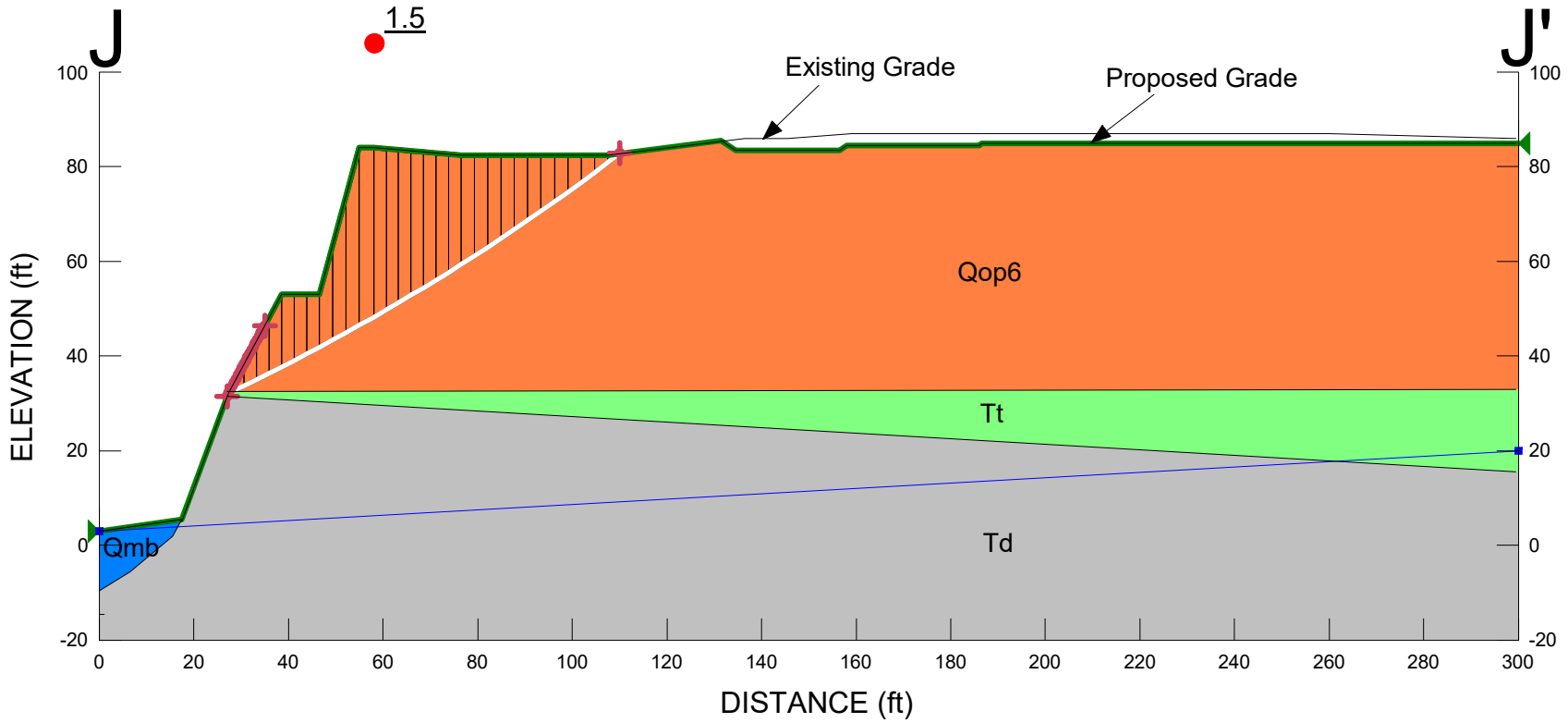

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Figure C-18

The Resort at Del Mar
Project No. G1710-32-04
Section K-K'
Name: KKc0.gsz
Date: 08/30/2019 Time: 08:09:02 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

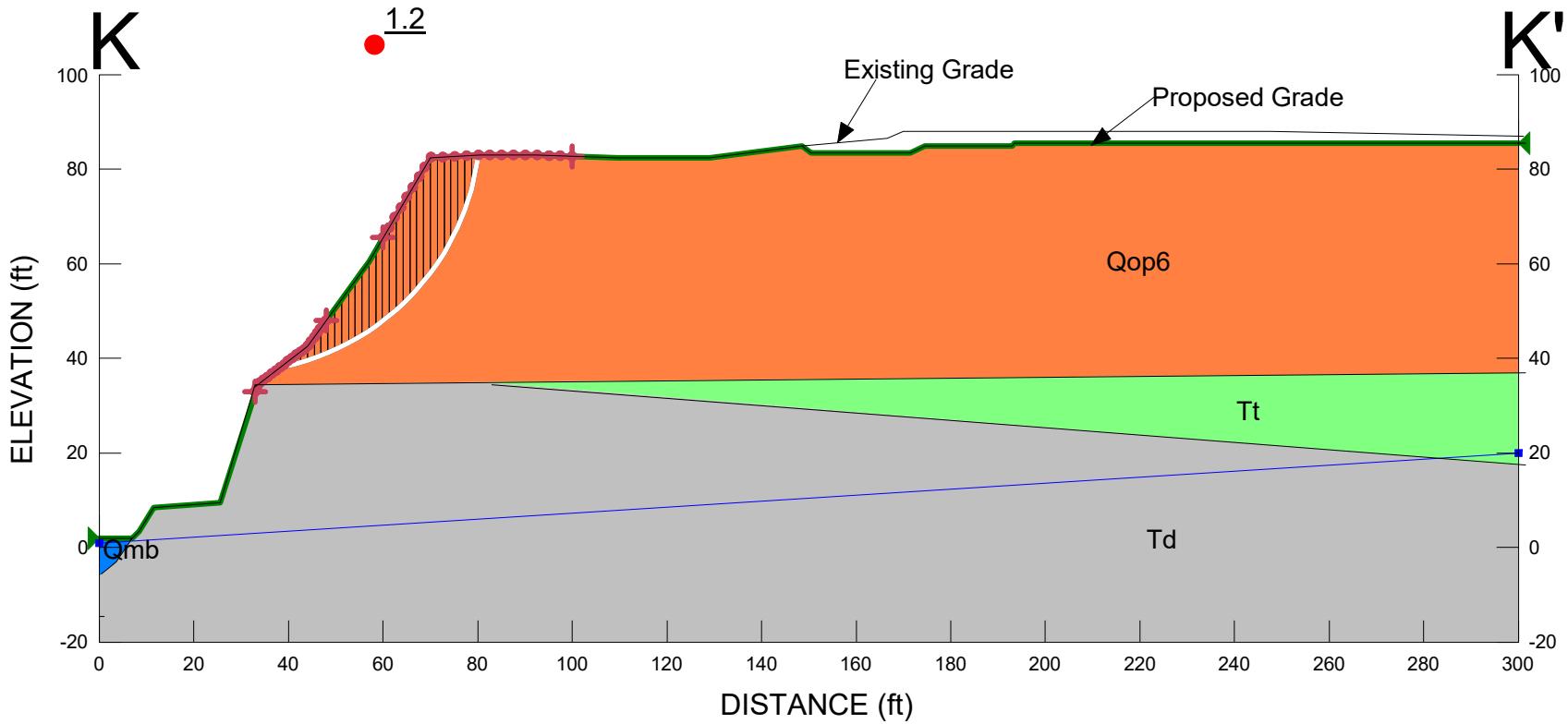

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Figure C-19

The Resort at Del Mar
Project No. G1710-32-04
Section K-K'
Name: KKc1.gsz
Date: 08/30/2019 Time: 08:06:12 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

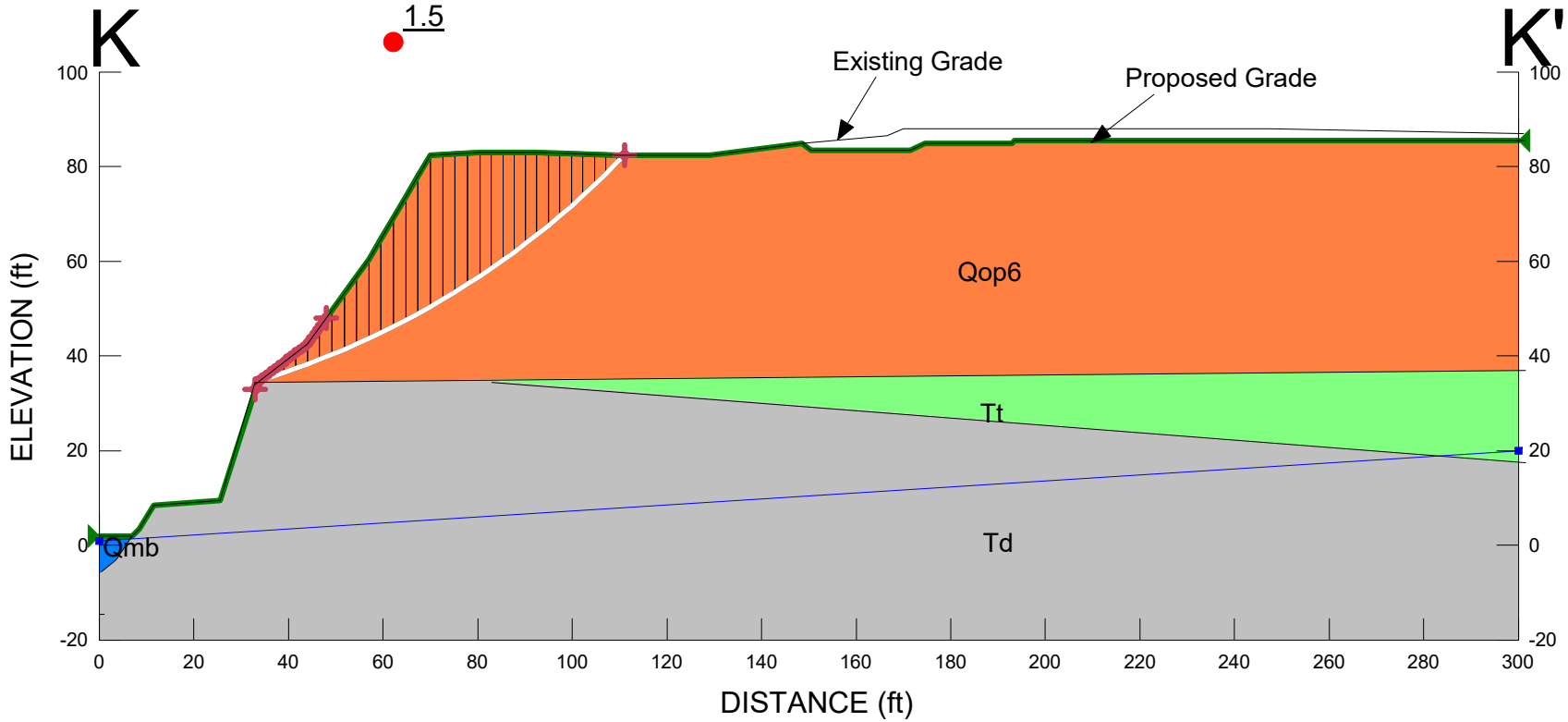

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Figure C-20

The Resort at Del Mar
Project No. G1710-32-04
Section L-L'
Name: LLc0.gsz
Date: 08/30/2019 Time: 08:17:02 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

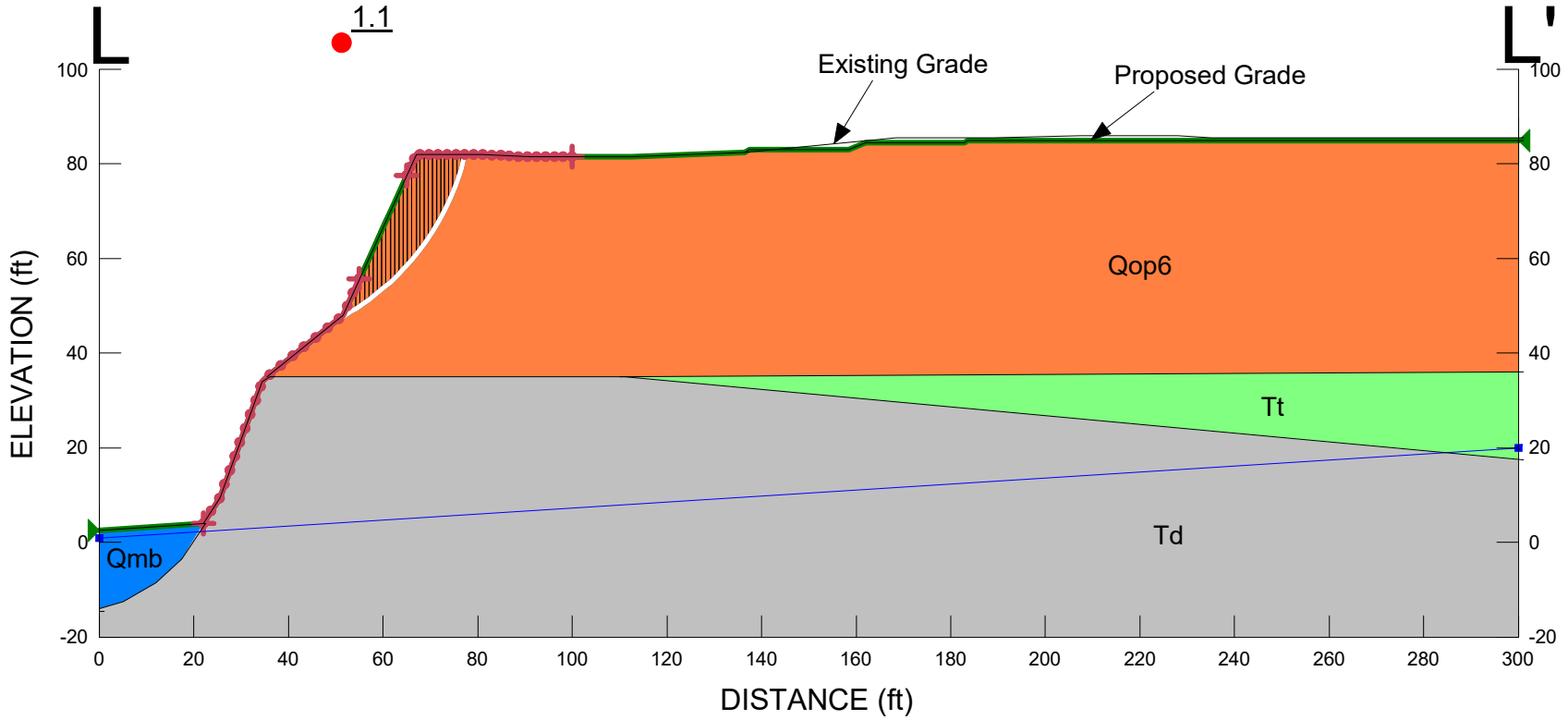

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Figure C-21

The Resort at Del Mar
Project No. G1710-32-04
Section L-L'
Name: LLc1.gsz
Date: 08/30/2019 Time: 08:19:01 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

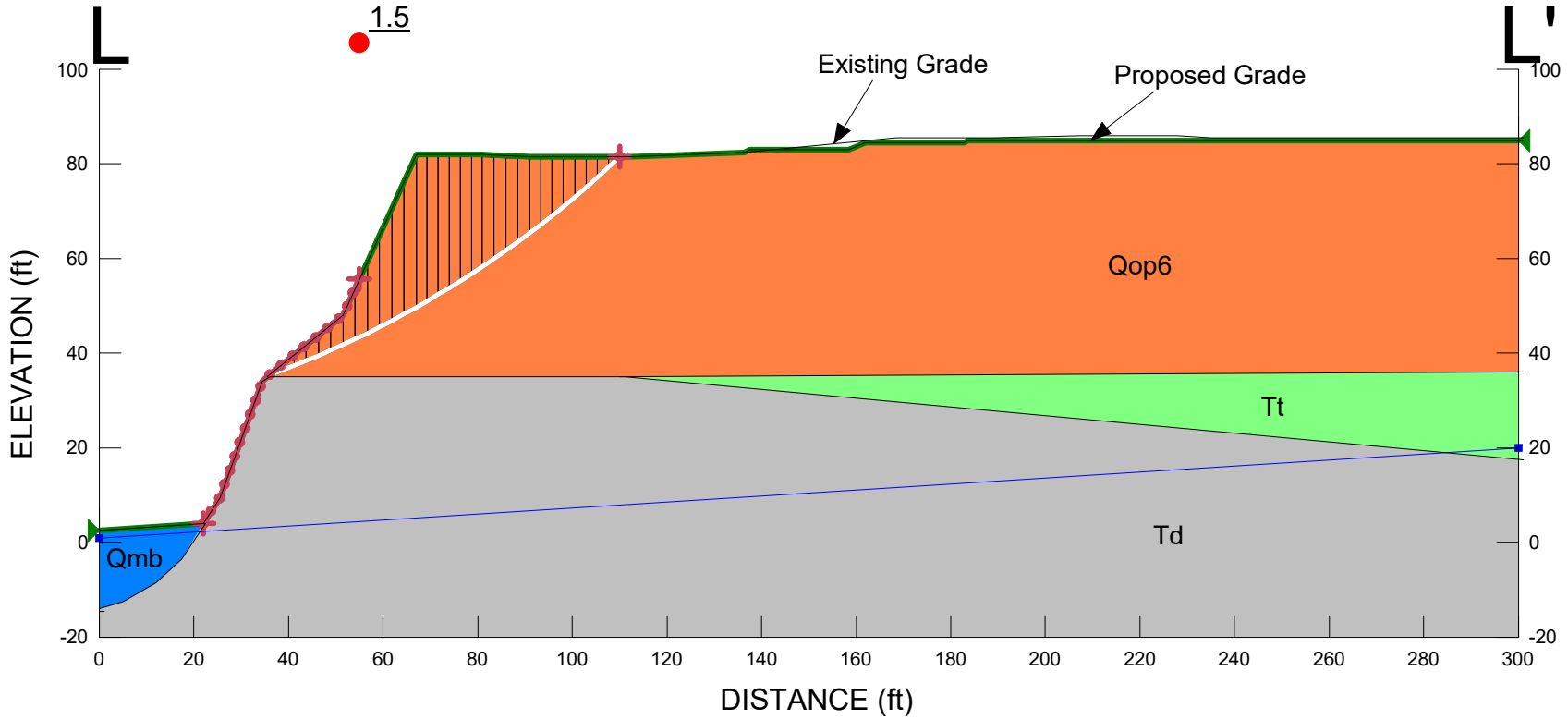

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Figure C-22

The Resort at Del Mar
Project No. G1710-32-04
Section M-M'
Name: MMc0.gsz
Date: 08/30/2019 Time: 08:24:25 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

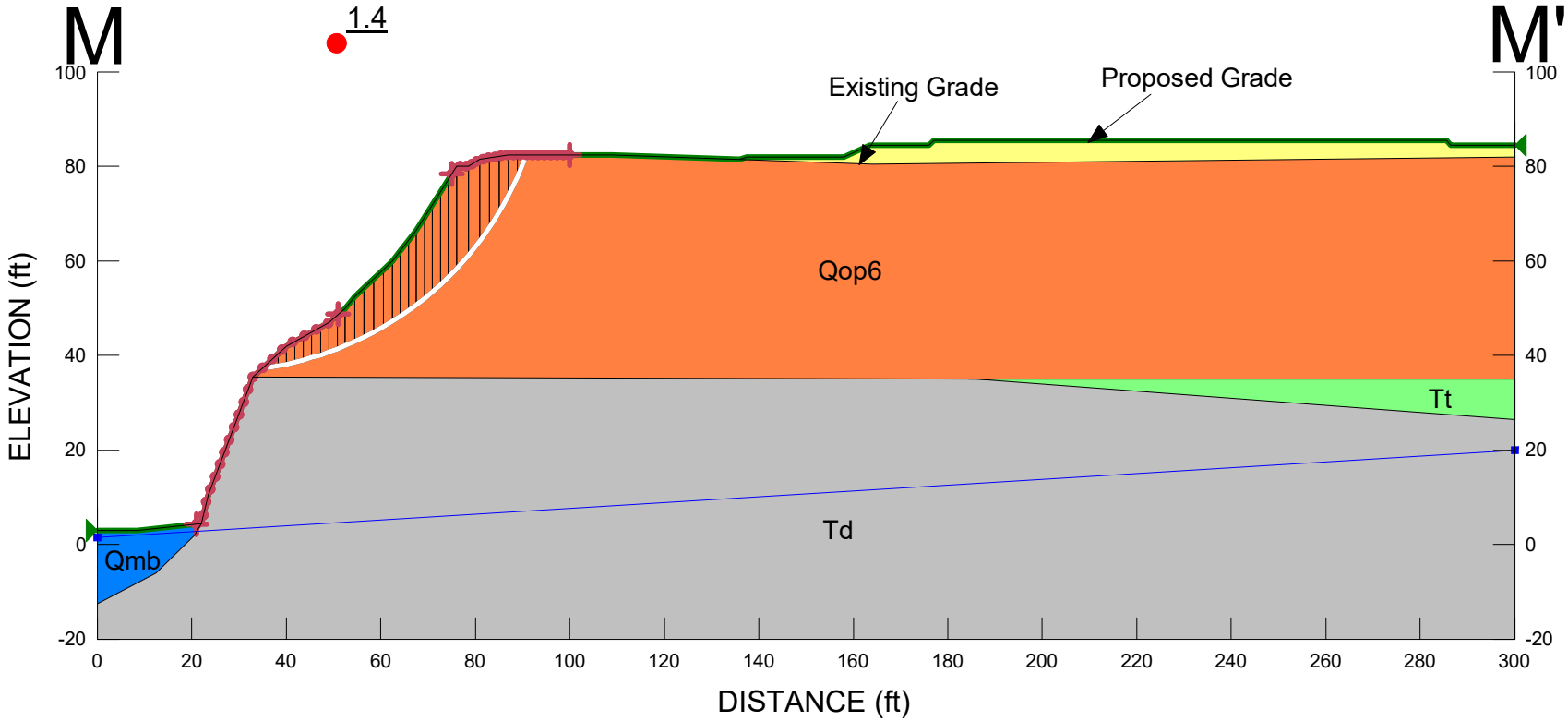

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Figure C-23

The Resort at Del Mar
Project No. G1710-32-04
Section M-M'
Name: MMc1.gsz
Date: 08/30/2019 Time: 08:26:25 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

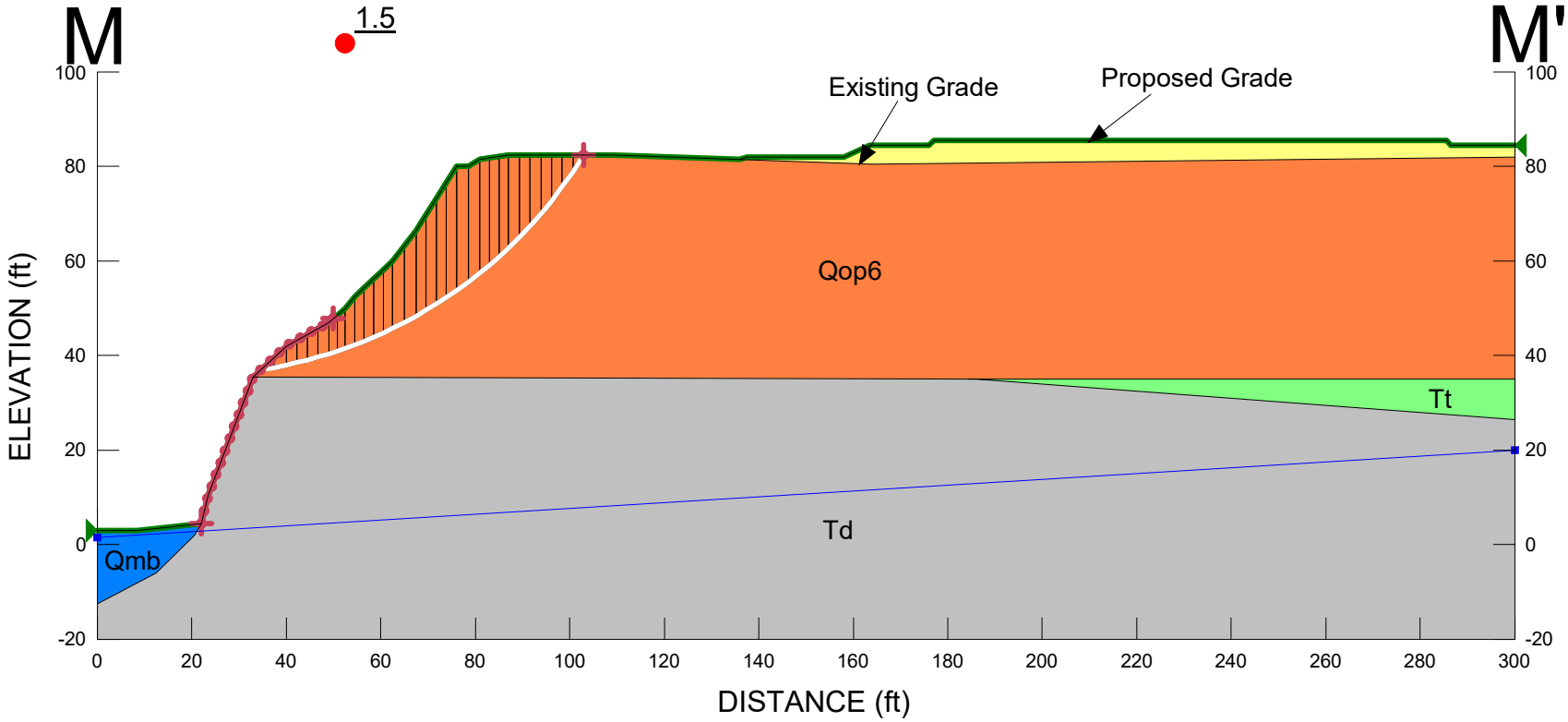

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Figure C-24

The Resort at Del Mar
Project No. G1710-32-04
Section N-N'
Name: NNc0.gsz
Date: 08/30/2019 Time: 08:31:17 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

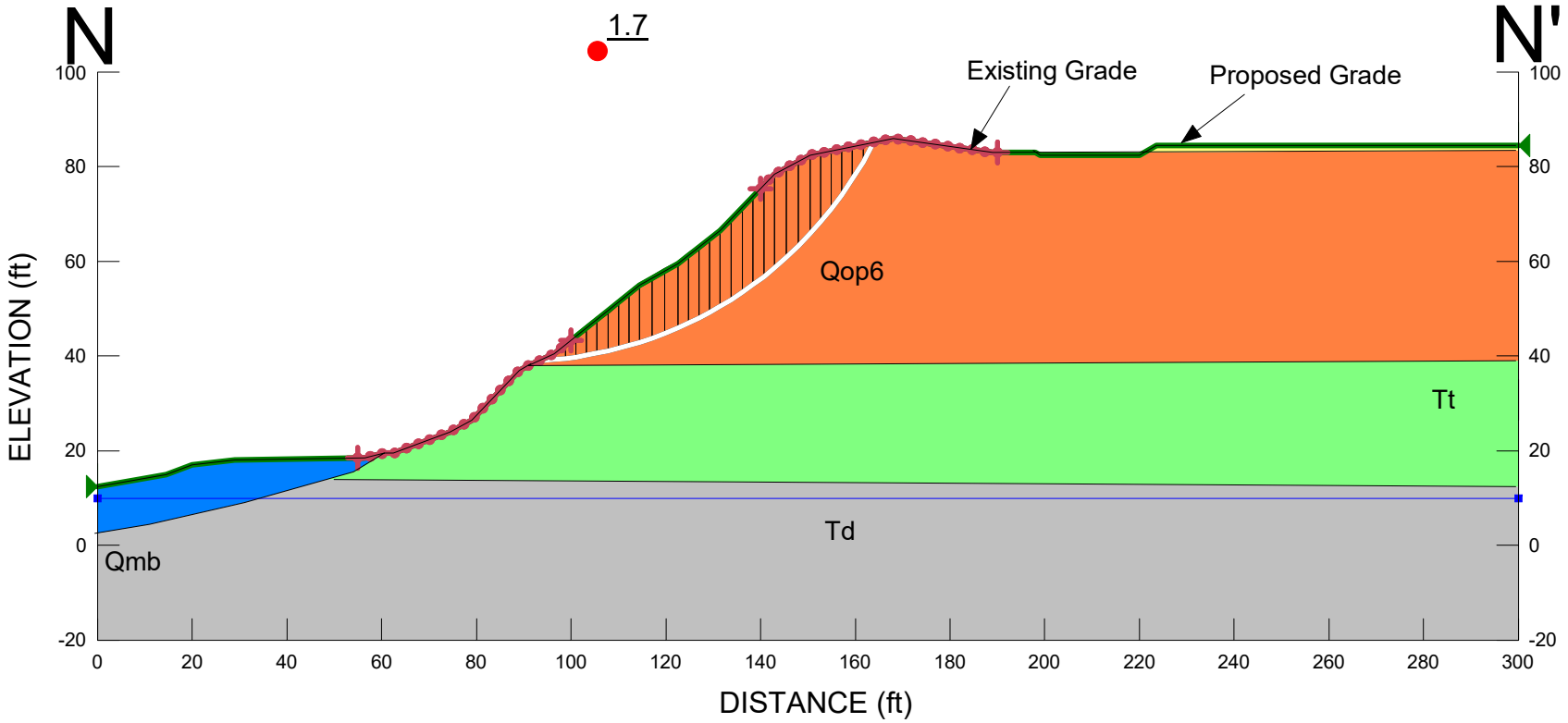

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Figure C-25

The Resort at Del Mar
Project No. G1710-32-04
Section O-O'
Name: OOc0.gsz
Date: 08/30/2019 Time: 08:38:12 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

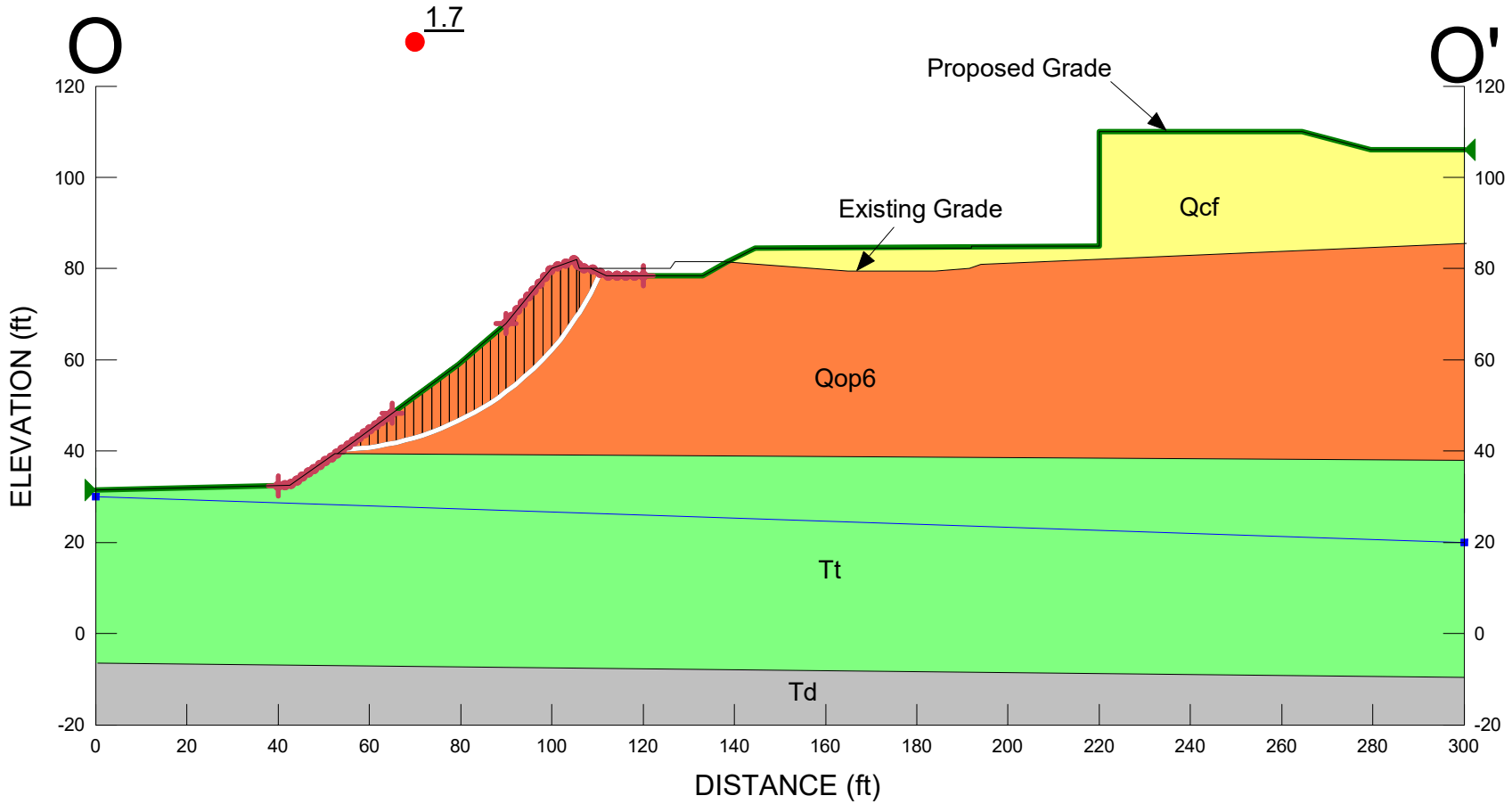

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Figure C-26

The Resort at Del Mar
Project No. G1710-32-04
Section P-P'
Name: PPc0.gsz
Date: 08/30/2019 Time: 08:41:09 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

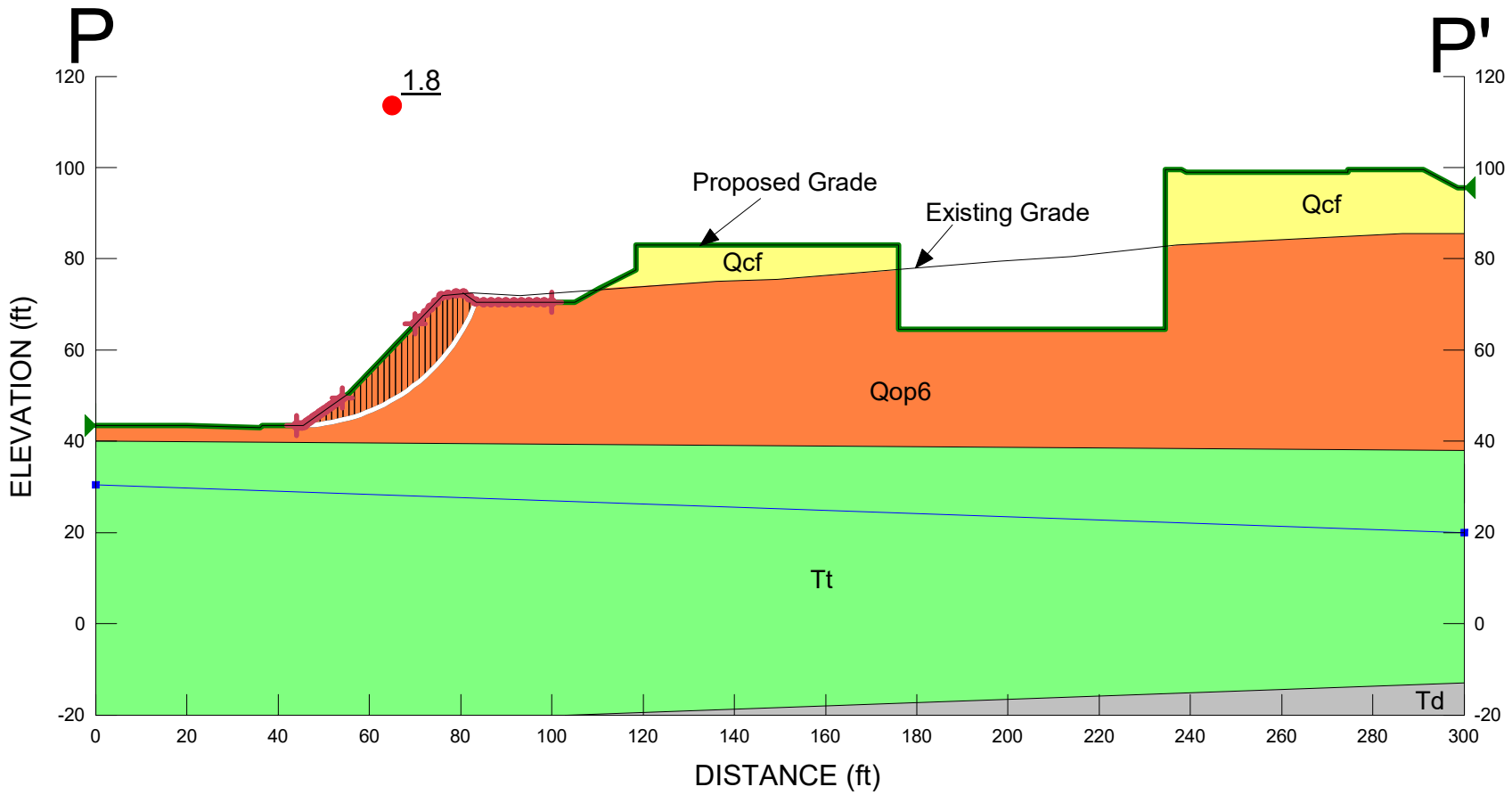

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Figure C-27

The Resort at Del Mar
Project No. G1710-32-04
Section Q-Q'
Name: QQc0.gsz
Date: 08/30/2019 Time: 08:46:07 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

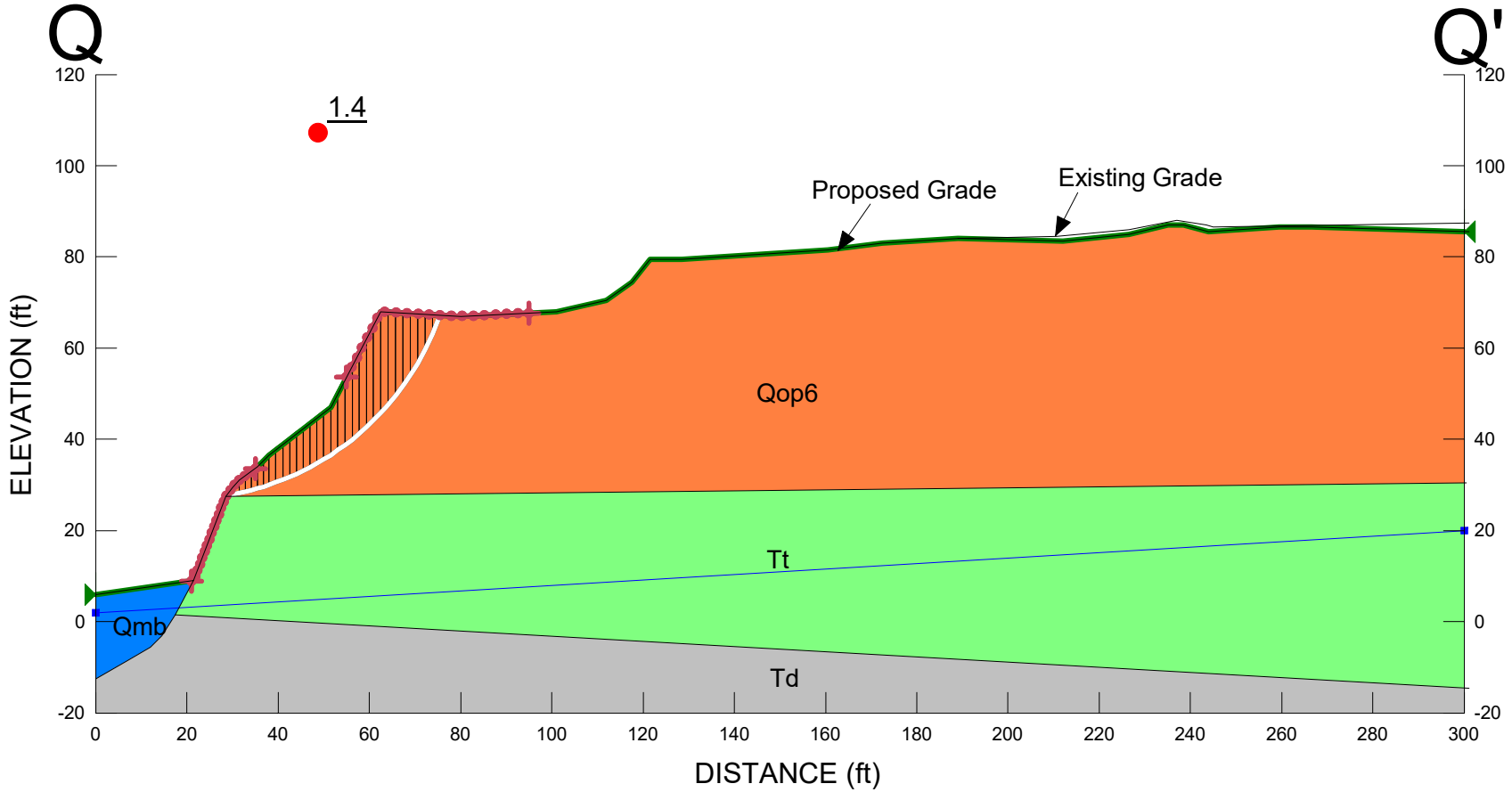

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Figure C-28

The Resort at Del Mar
Project No. G1710-32-04
Section Q-Q'
Name: QQc1.gsz
Date: 08/30/2019 Time: 08:48:55 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

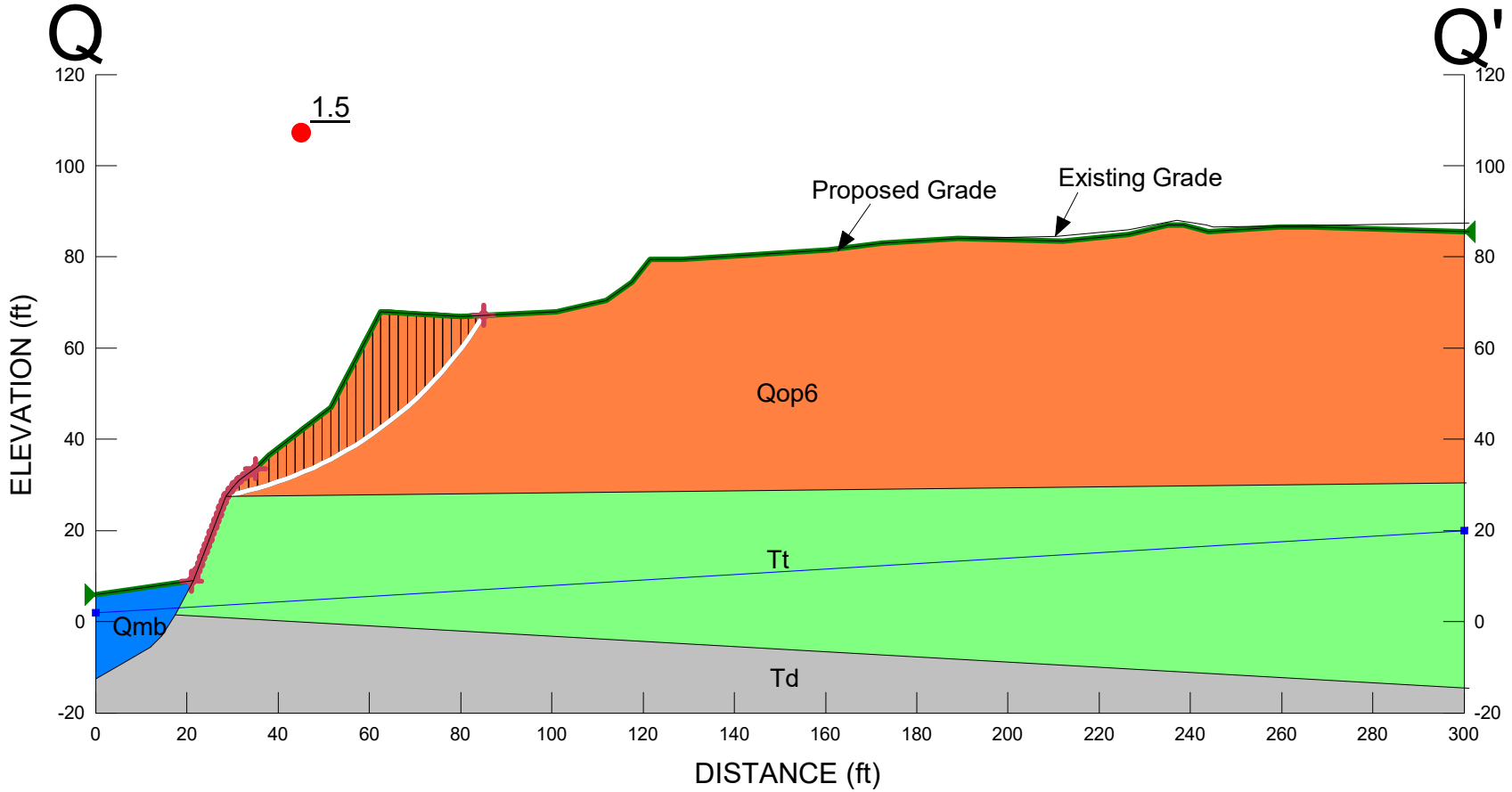

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Figure C-29

The Resort at Del Mar
Project No. G1710-32-04
Section R-R'
Name: RRc0.gsz
Date: 08/30/2019 Time: 08:53:27 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qbp - Brush Pile	100	0	2
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

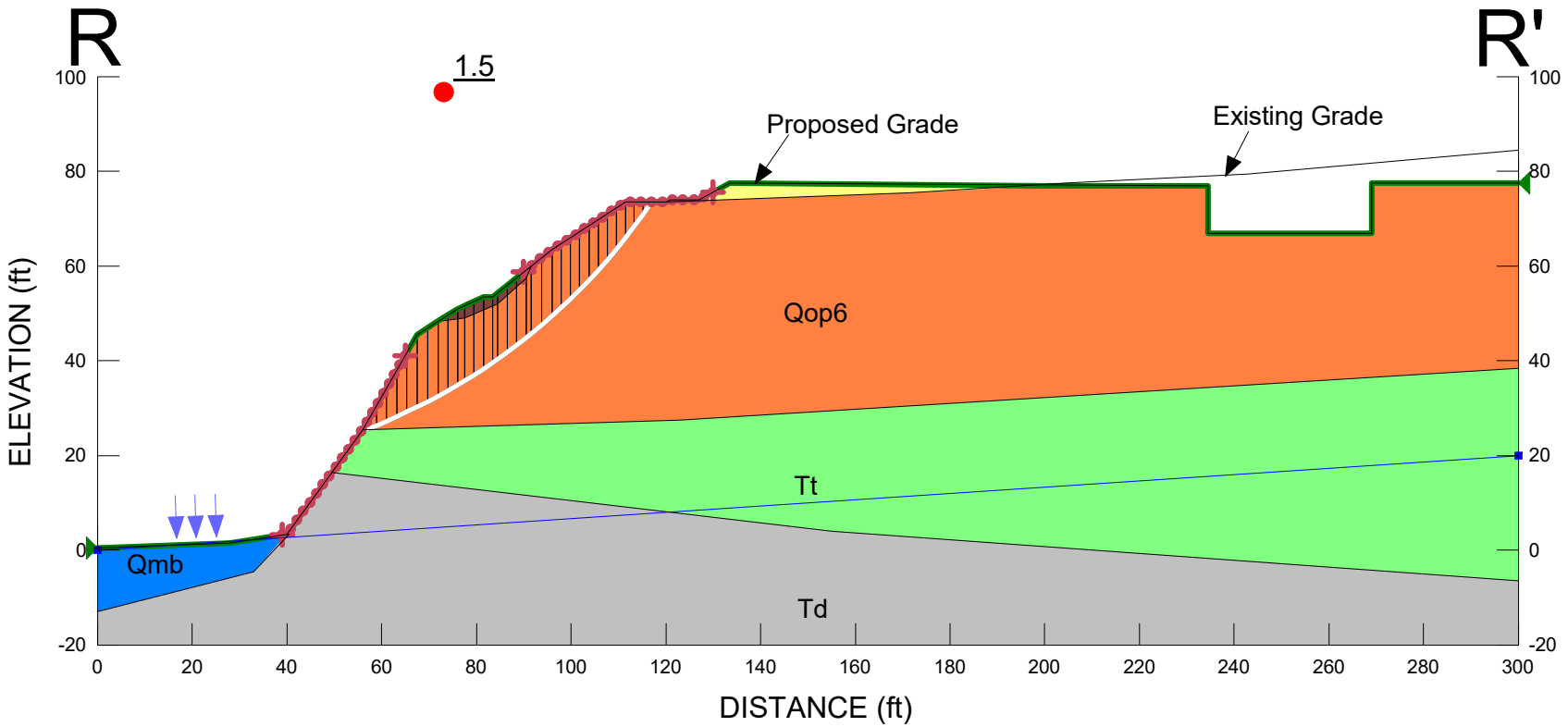

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Figure C-30

The Resort at Del Mar
Project No. G1710-32-04
Section S-S'
Name: SSc0.gsz
Date: 08/30/2019 Time: 08:57:20 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

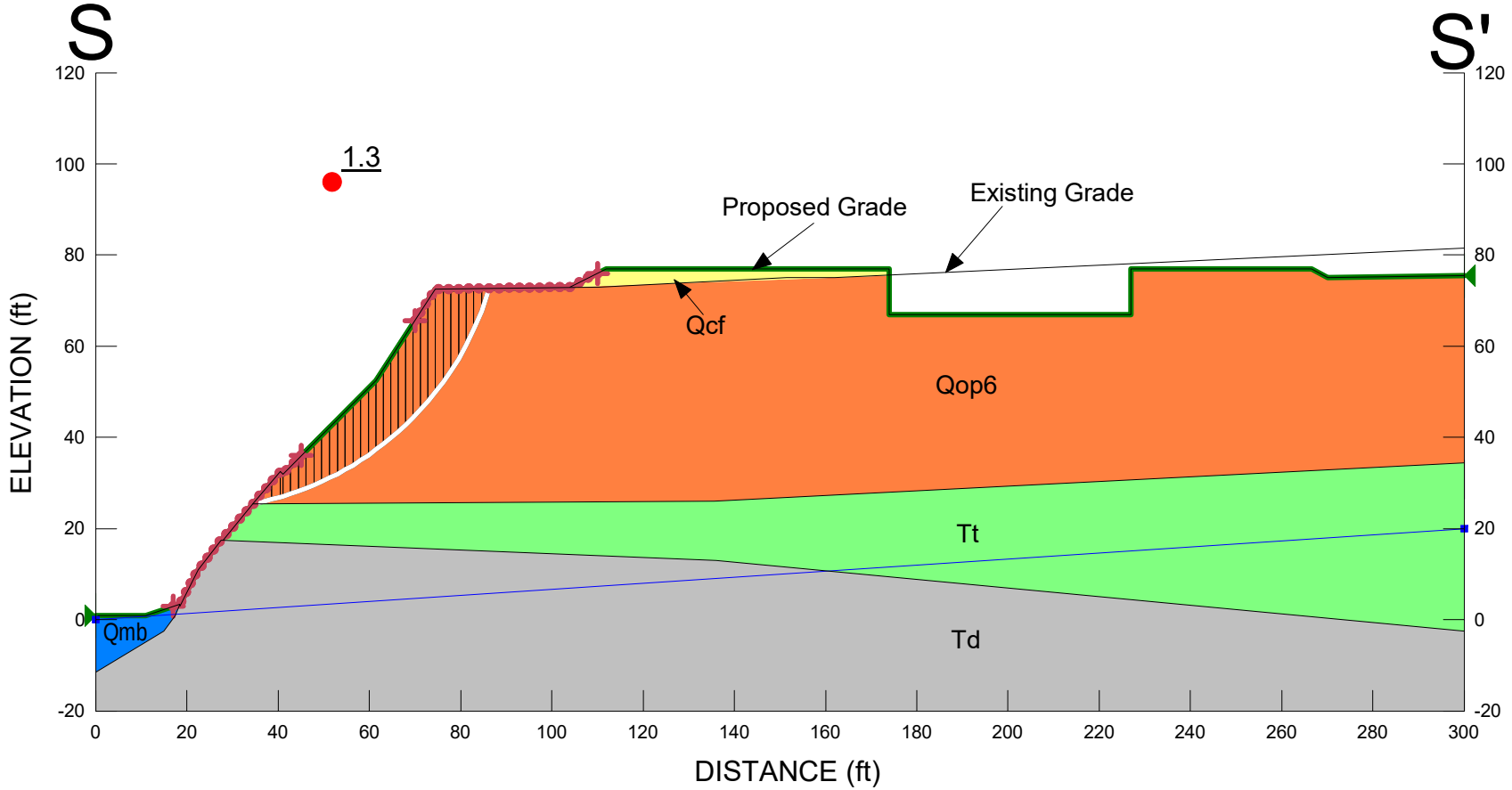

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Figure C-31

The Resort at Del Mar
Project No. G1710-32-04
Section S-S'
Name: SSc1.gsz
Date: 08/30/2019 Time: 08:56:49 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

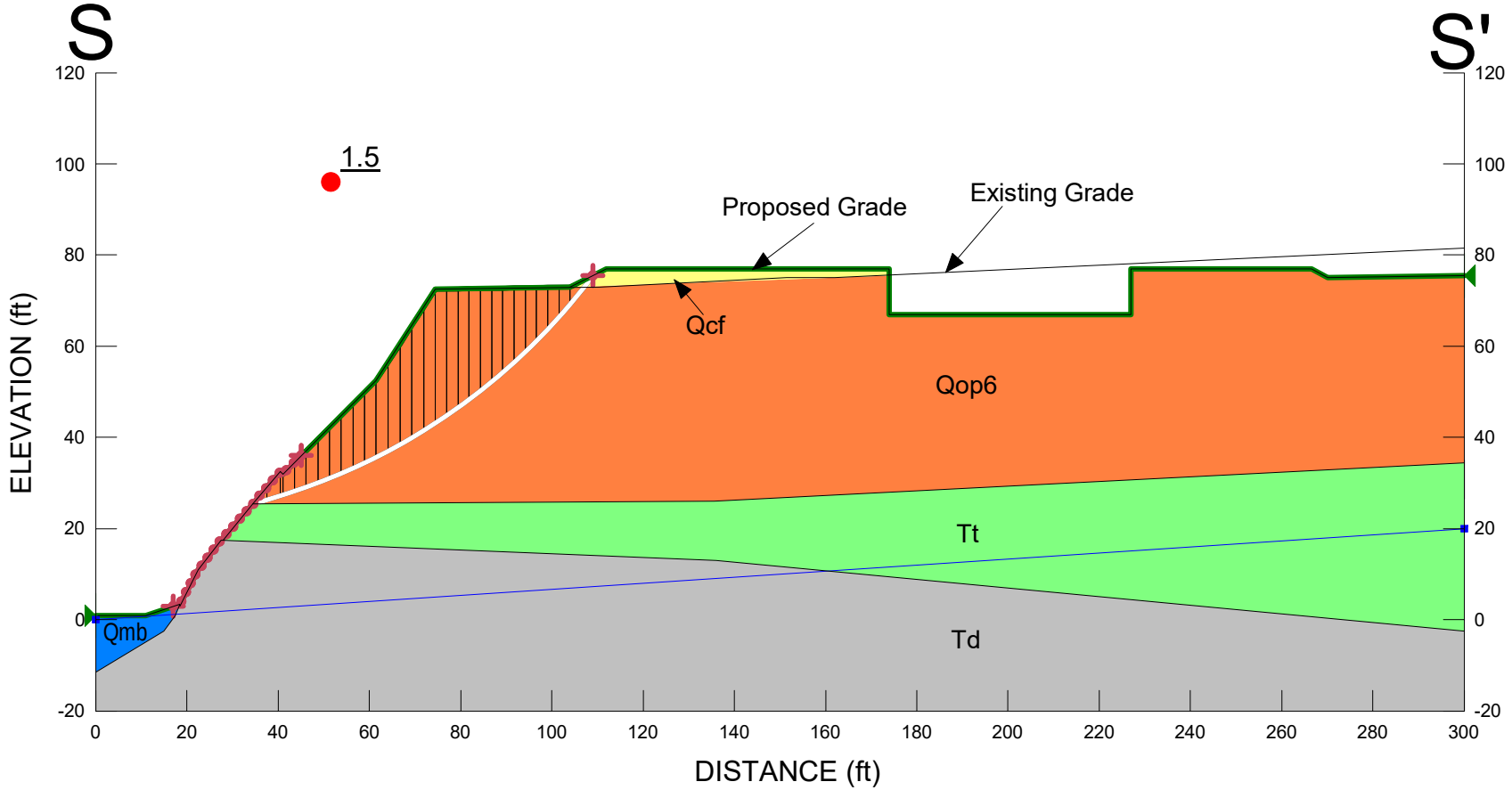

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Figure C-32

The Resort at Del Mar
Project No. G1710-32-04
Section T-T'
Name: TTc0.gsz
Date: 08/30/2019 Time: 09:04:26 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

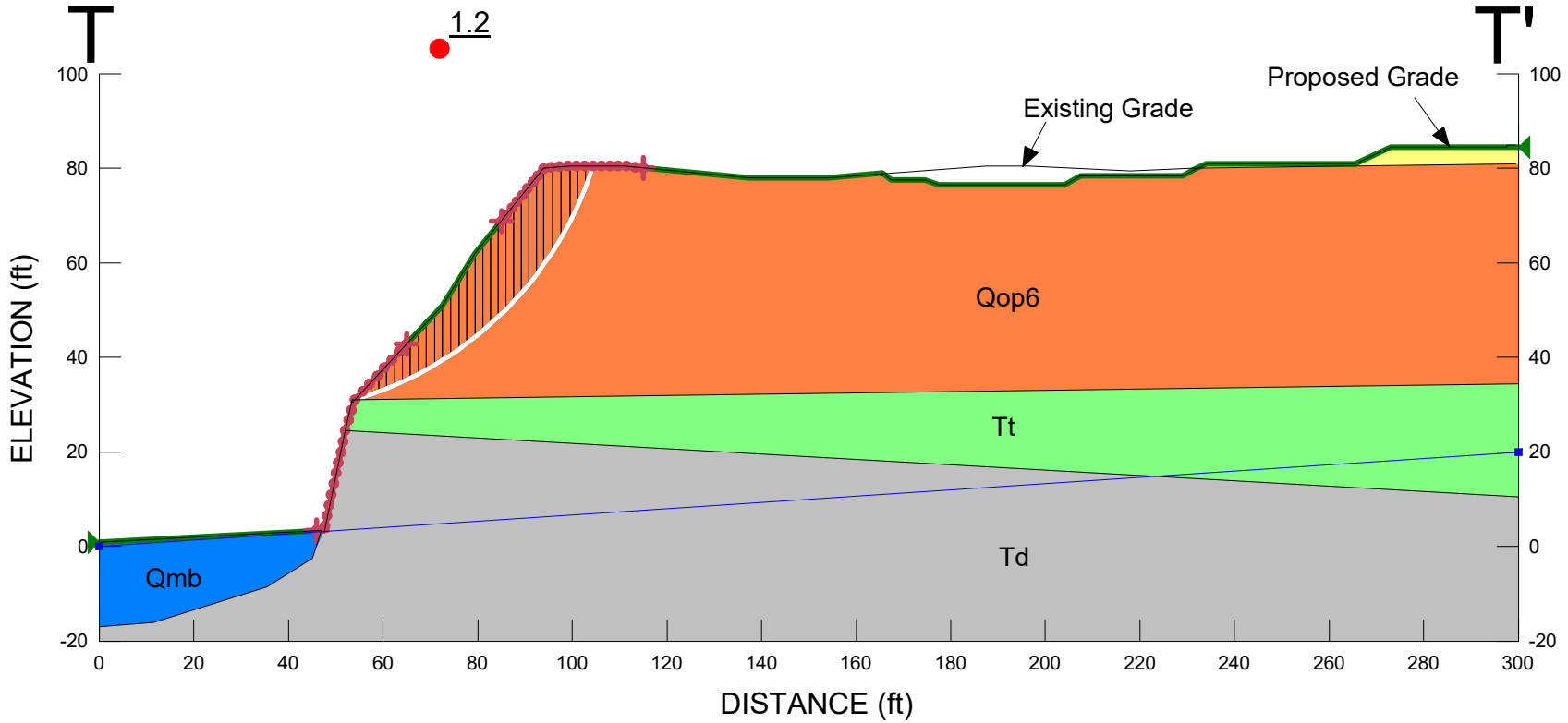

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Figure C-33

The Resort at Del Mar
Project No. G1710-32-04
Section T-T'
Name: TTc1.gsz
Date: 08/30/2019 Time: 09:08:12 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

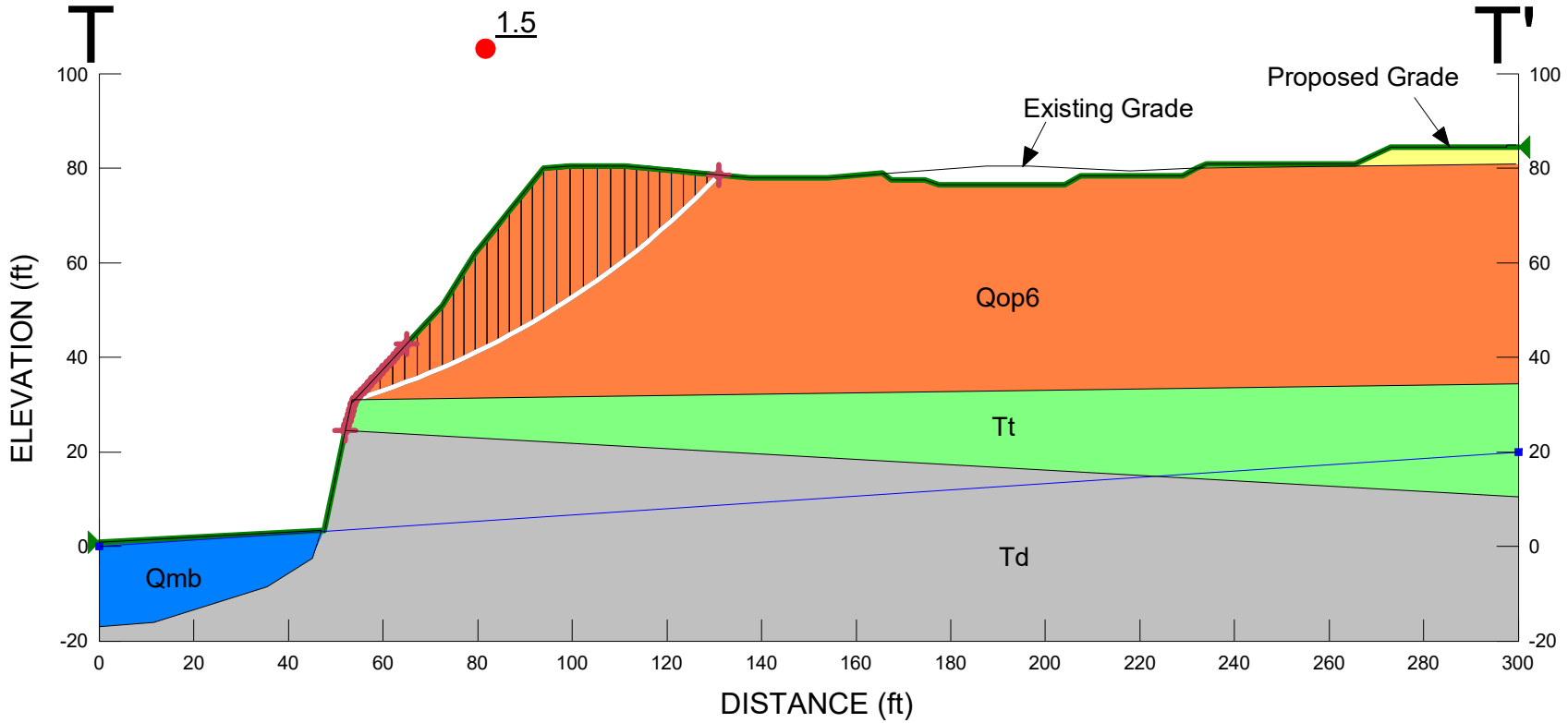

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Figure C-34

The Resort at Del Mar
Project No. G1710-32-04
Section U-U'
Name: UUc0.gsz
Date: 08/30/2019 Time: 09:15:15 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

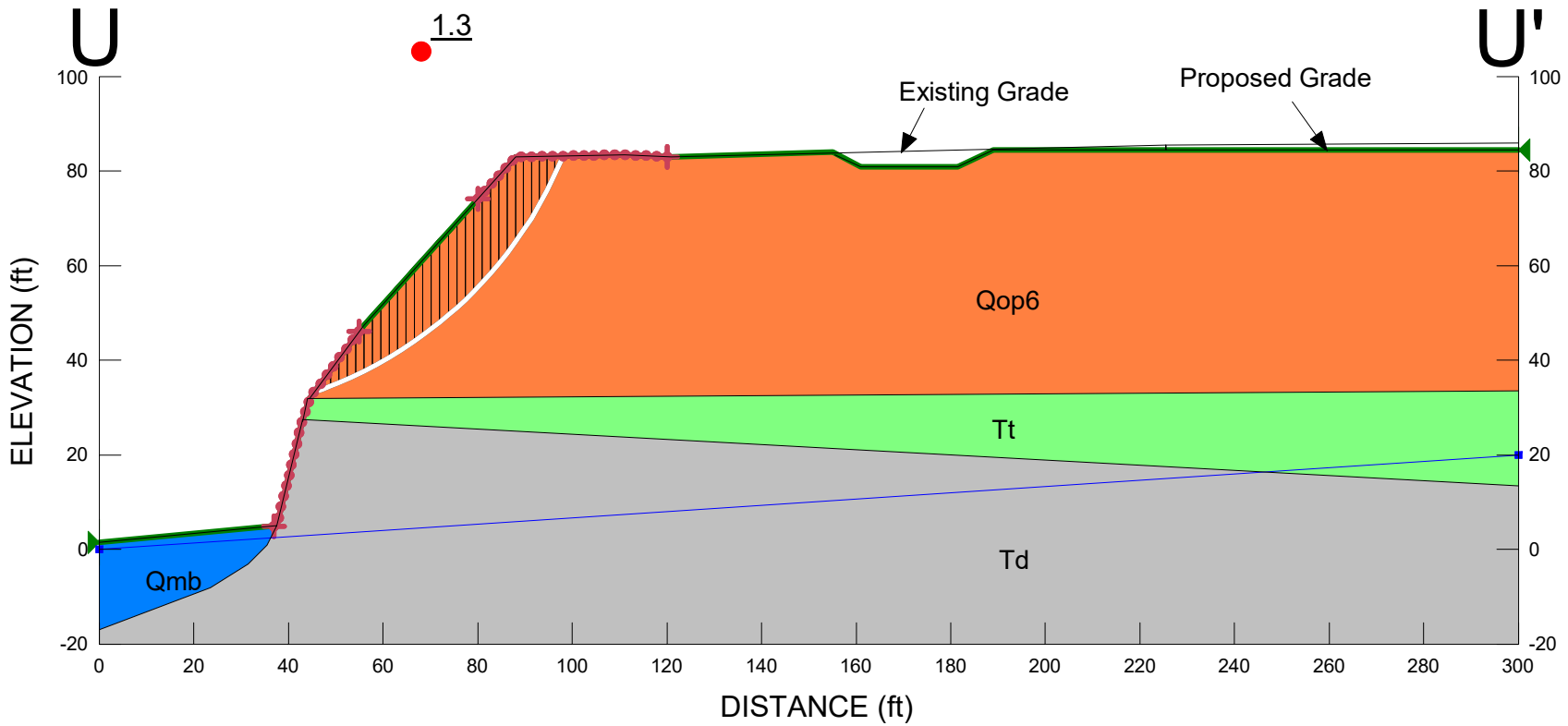

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Figure C-35

The Resort at Del Mar
Project No. G1710-32-04
Section U-U'
Name: UUc1.gsz
Date: 08/30/2019 Time: 09:16:37 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

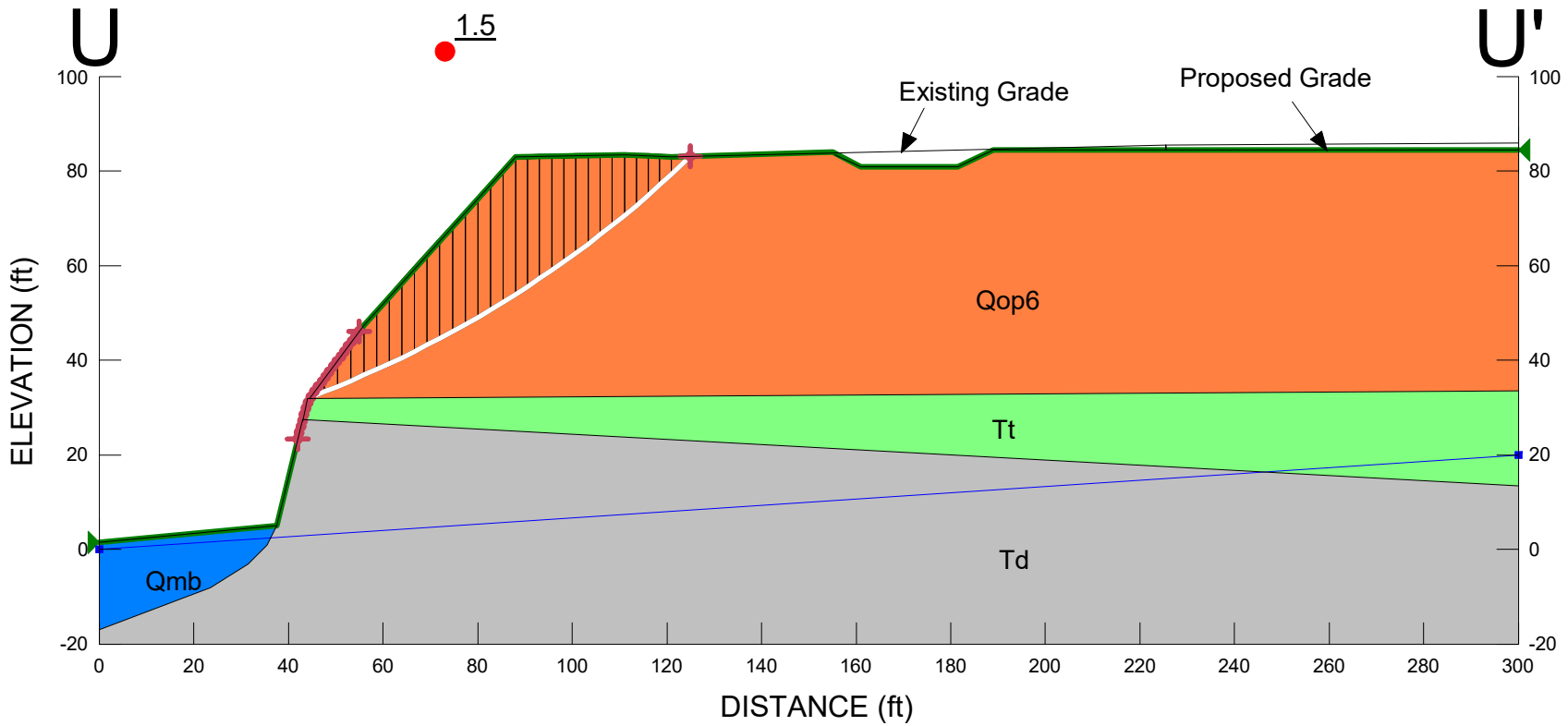

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Figure C-36

The Resort at Del Mar
Project No. G1710-32-04
Section V-V'
Name: VVc0.gsz
Date: 08/30/2019 Time: 09:20:35 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

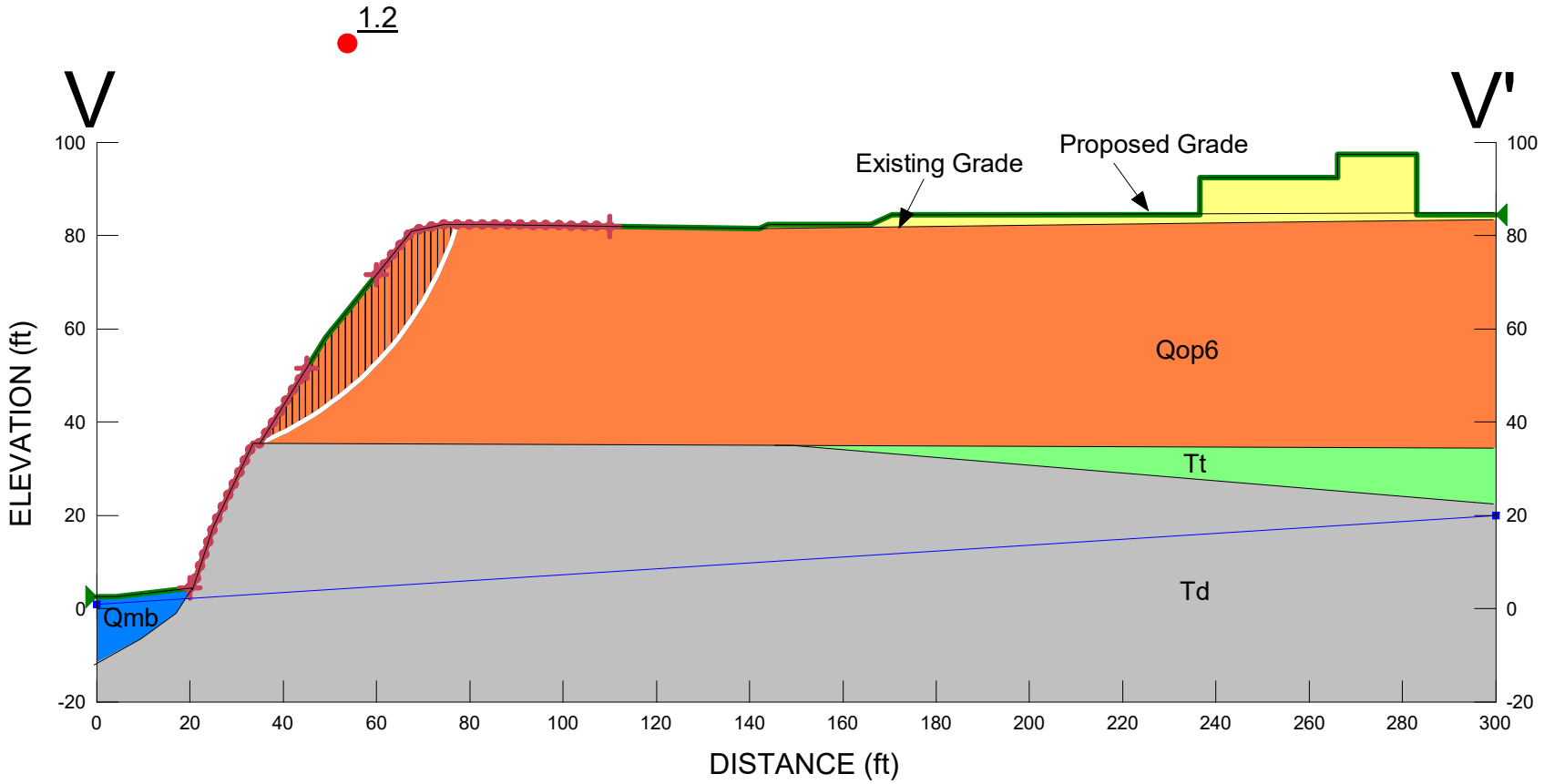

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Figure C-37

The Resort at Del Mar
Project No. G1710-32-04
Section V-V'
Name: VVc1.gsz
Date: 08/30/2019 Time: 09:19:40 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

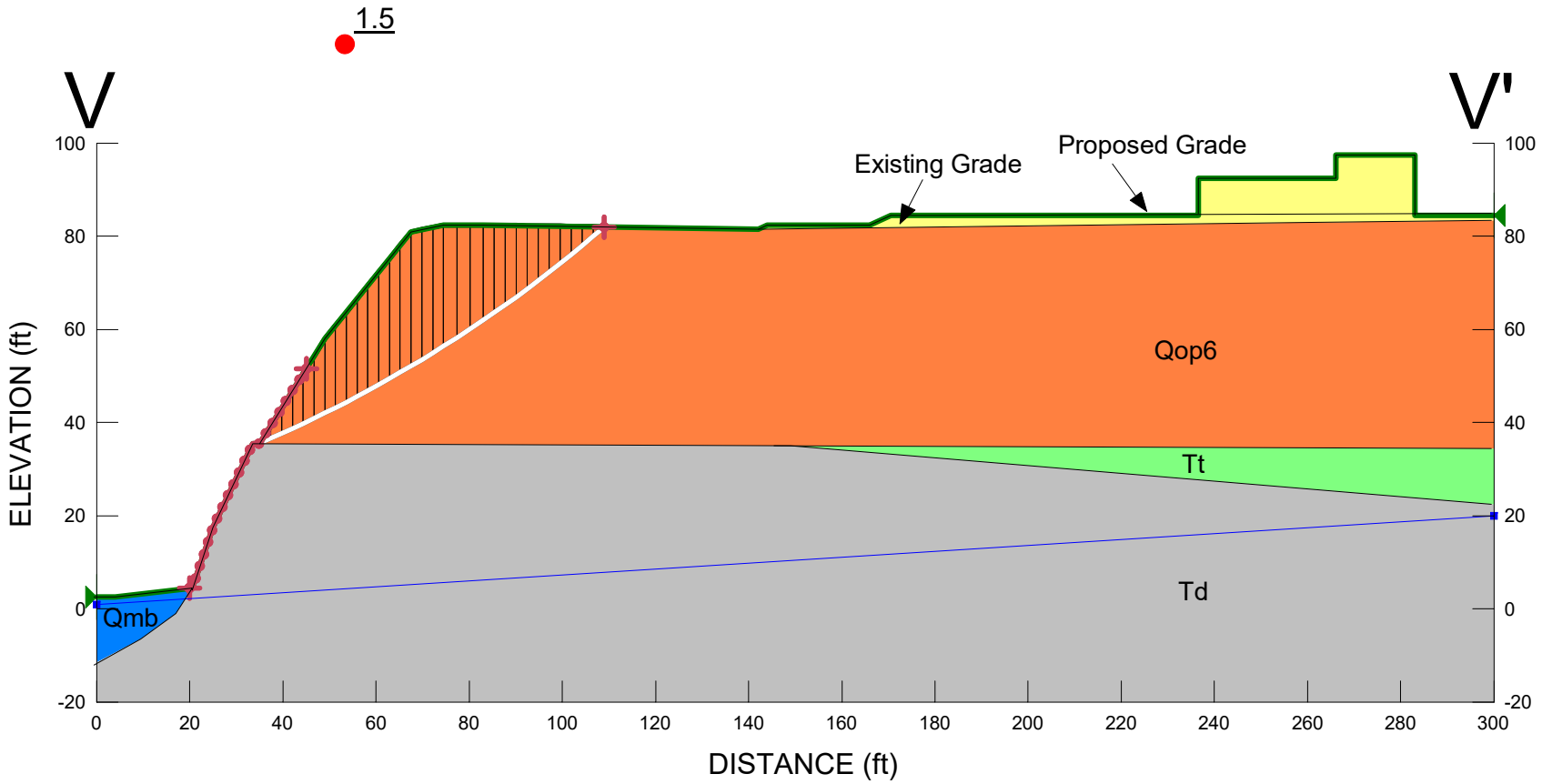

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Figure C-38

The Resort at Del Mar
Project No. G1710-32-04
Section W-W'
Name: WWc0.gsz
Date: 08/30/2019 Time: 09:51:50 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

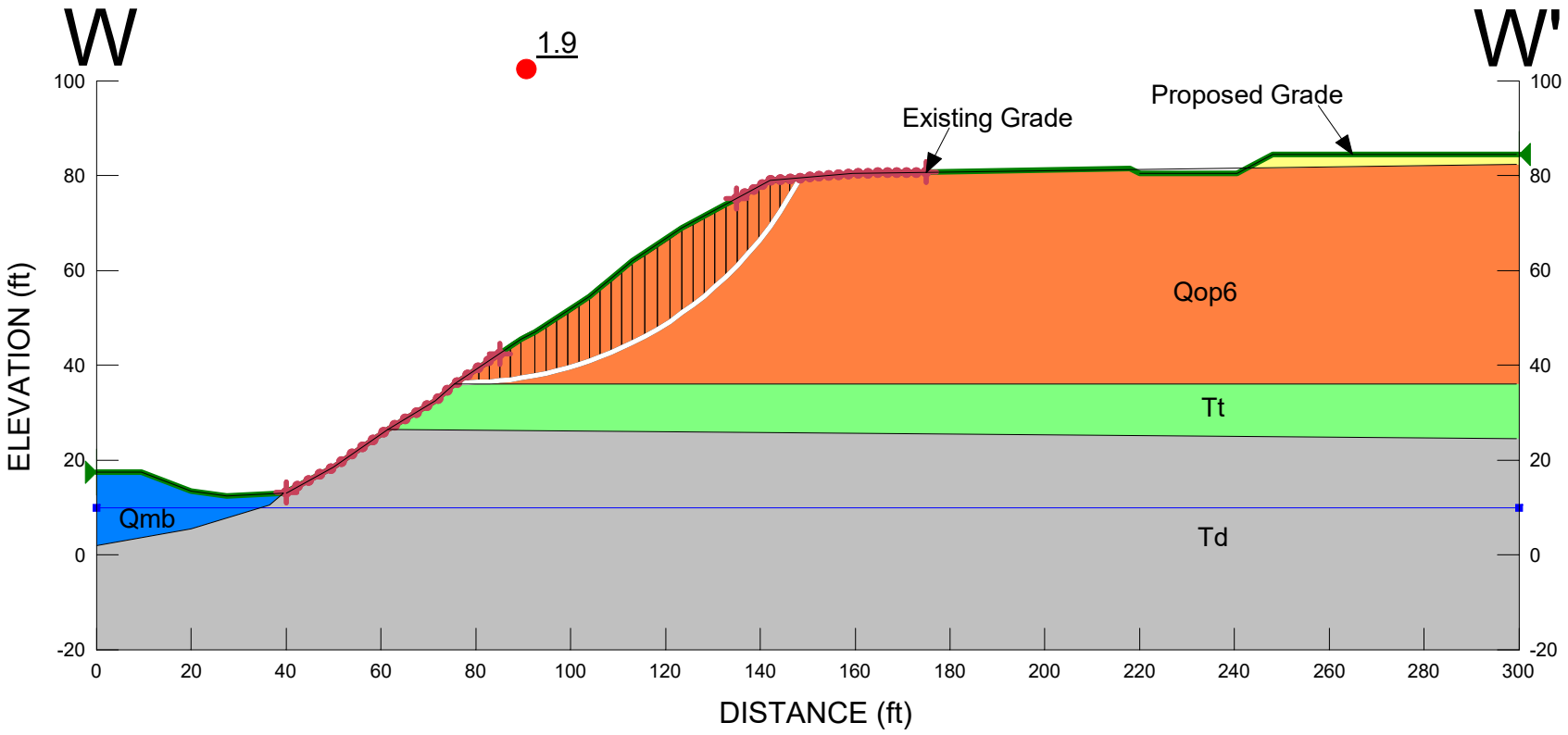

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Figure C-39

The Resort at Del Mar
Project No. G1710-32-04
Section X-X'
Name: XXc0.gsz
Date: 08/30/2019 Time: 09:40:59 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

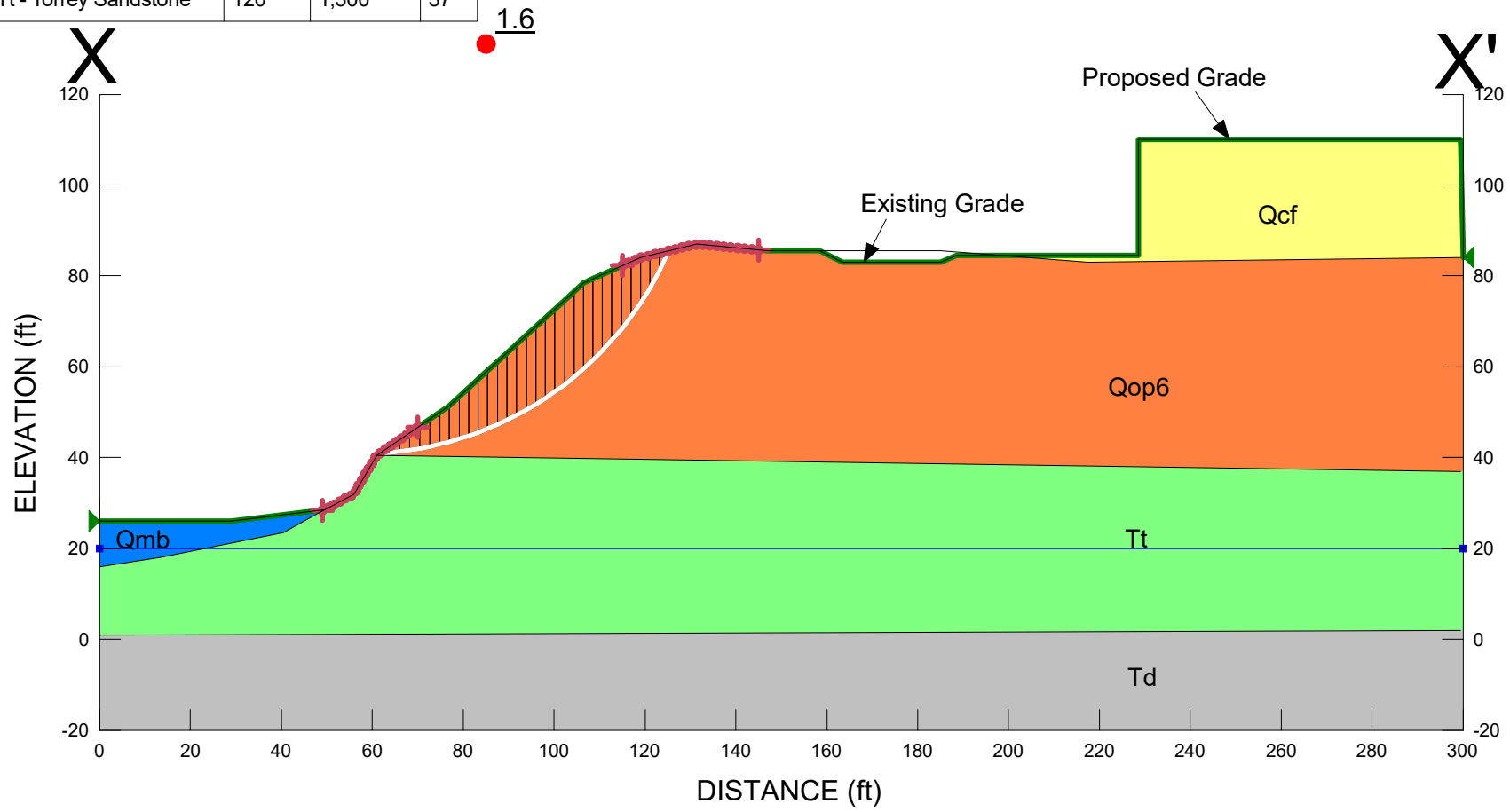

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Figure C-40

The Resort at Del Mar
Project No. G1710-32-04
Section Y-Y'
Name: YYc0.gsz
Date: 08/28/2019 Time: 07:16:10 AM

Proposed Condition

Static Analysis

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

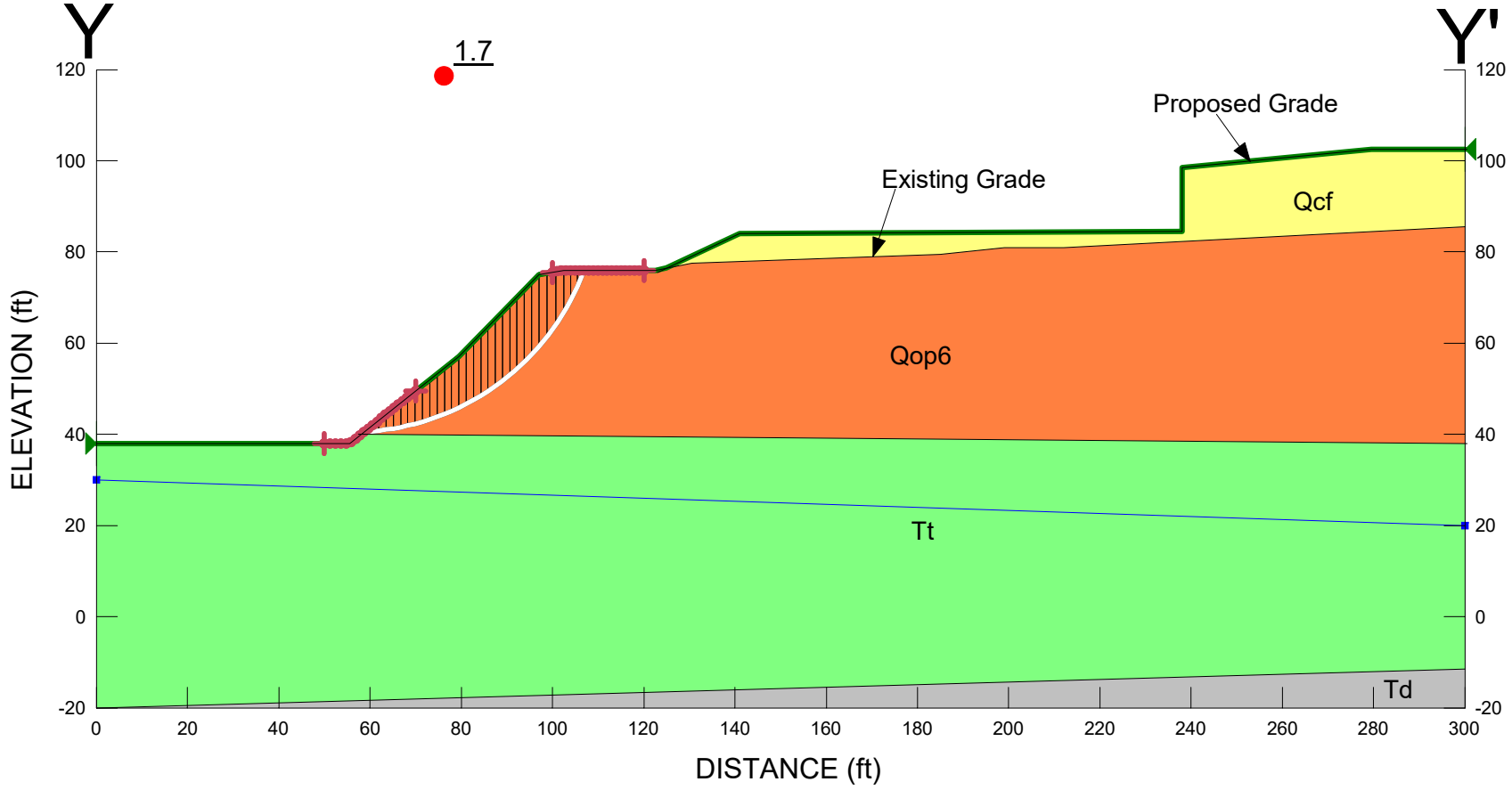

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Figure C-41

The Resort at Del Mar
Project No. G1710-32-04
Section A-A'
Name: AAc0s.gsz
Date: 08/30/2019 Time: 10:53:21 AM

Proposed Condition

Seismic Analysis
Keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

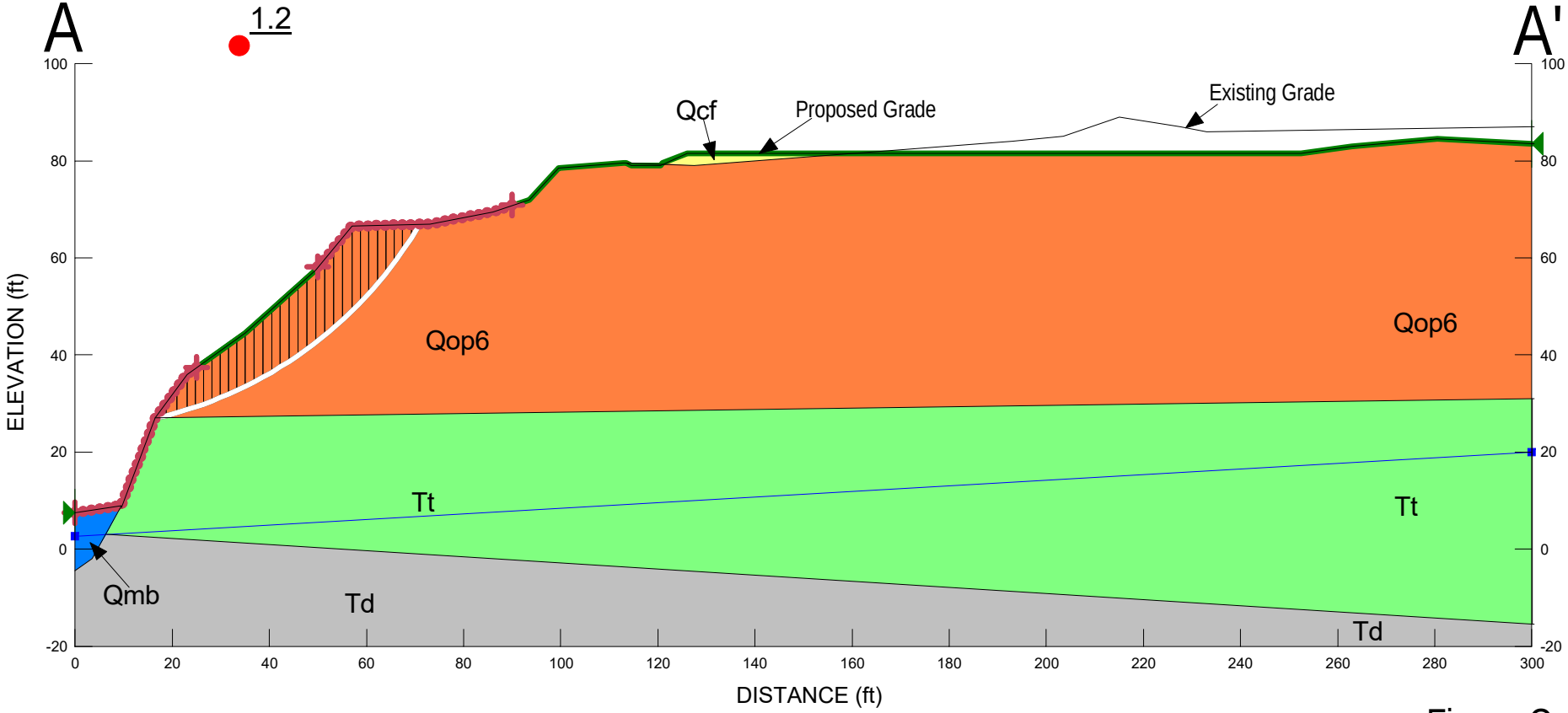

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Figure C-42

The Resort at Del Mar
Project No. G1710-32-04
Section B-B'
Name: BBc1s.gsz
Date: 08/30/2019 Time: 10:56:45 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

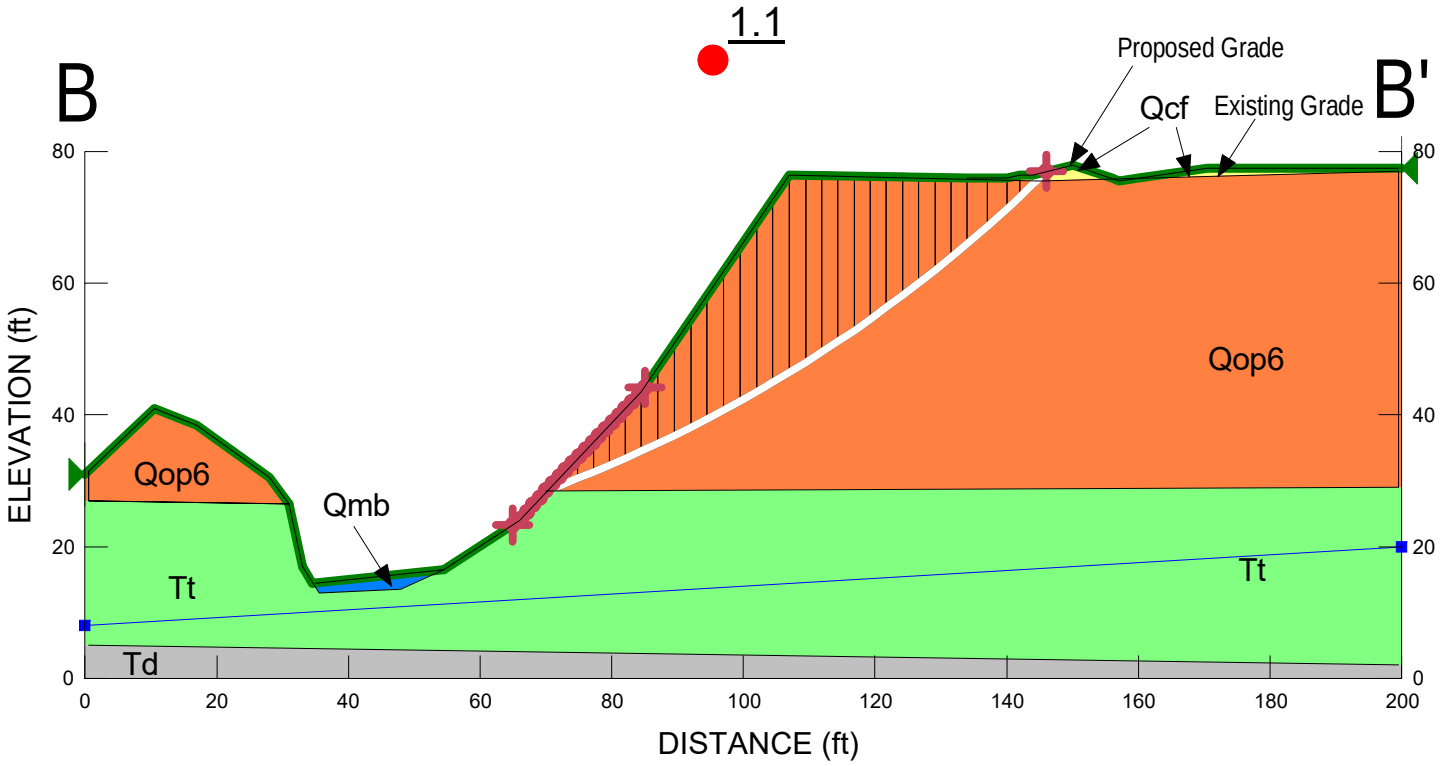

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Figure C-43

The Resort at Del Mar
Project No. G1710-32-04
Section C-C'
Name: CCc1s.gsz
Date: 08/30/2019 Time: 10:58:56 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

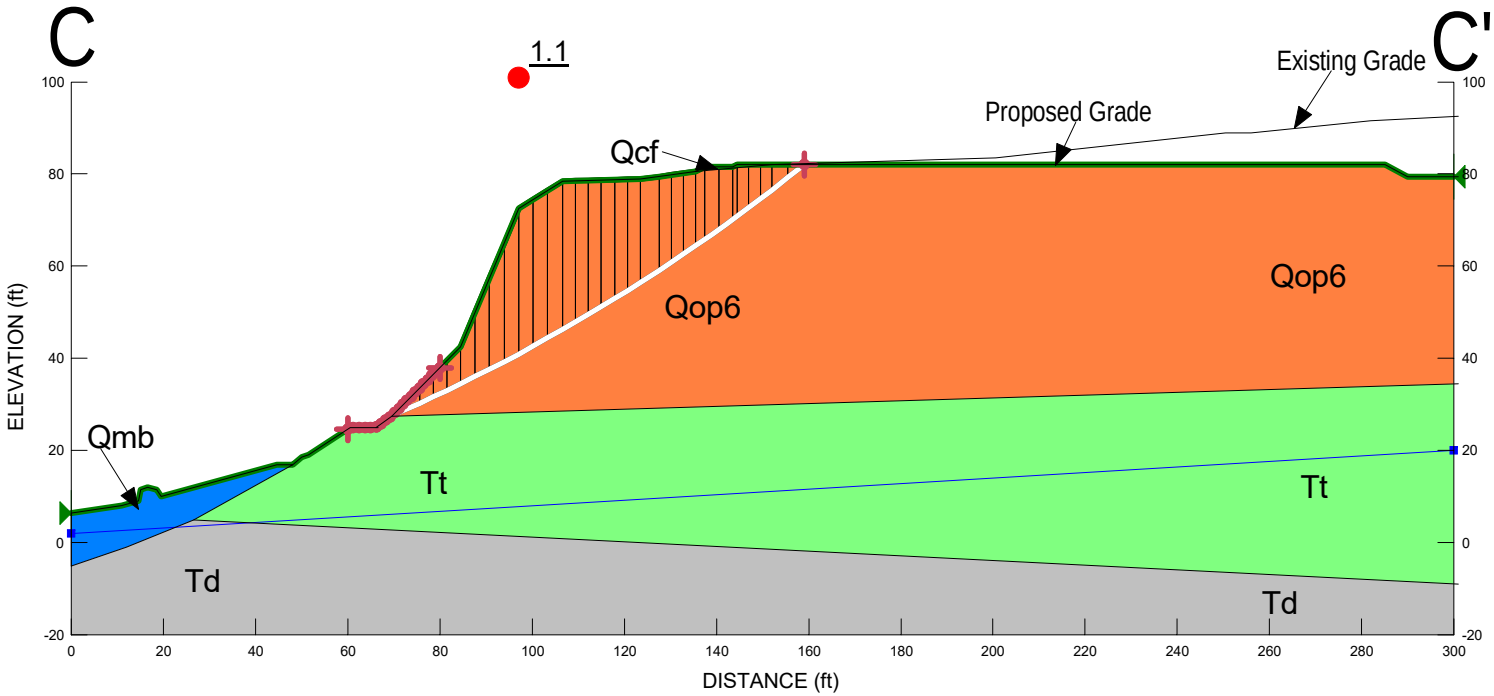

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Figure C-44

The Resort at Del Mar
Project No. G1710-32-04
Section D-D'
Name: DDc0s.gsz
Date: 09/05/2019 Time: 07:19:28 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

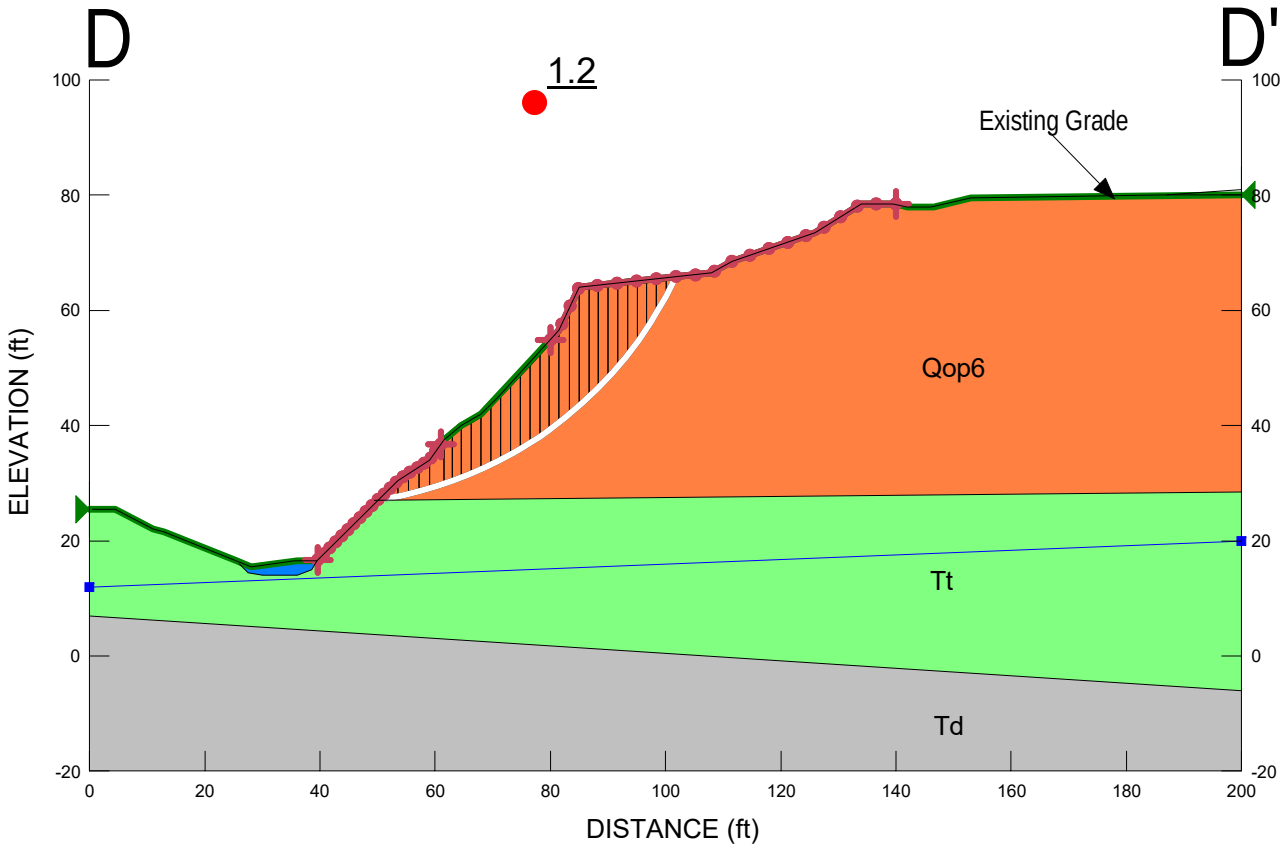

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Figure C-45

The Resort at Del Mar
Project No. G1710-32-04
Section E-E'
Name: EEc1s.gsz
Date: 09/05/2019 Time: 07:23:16 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

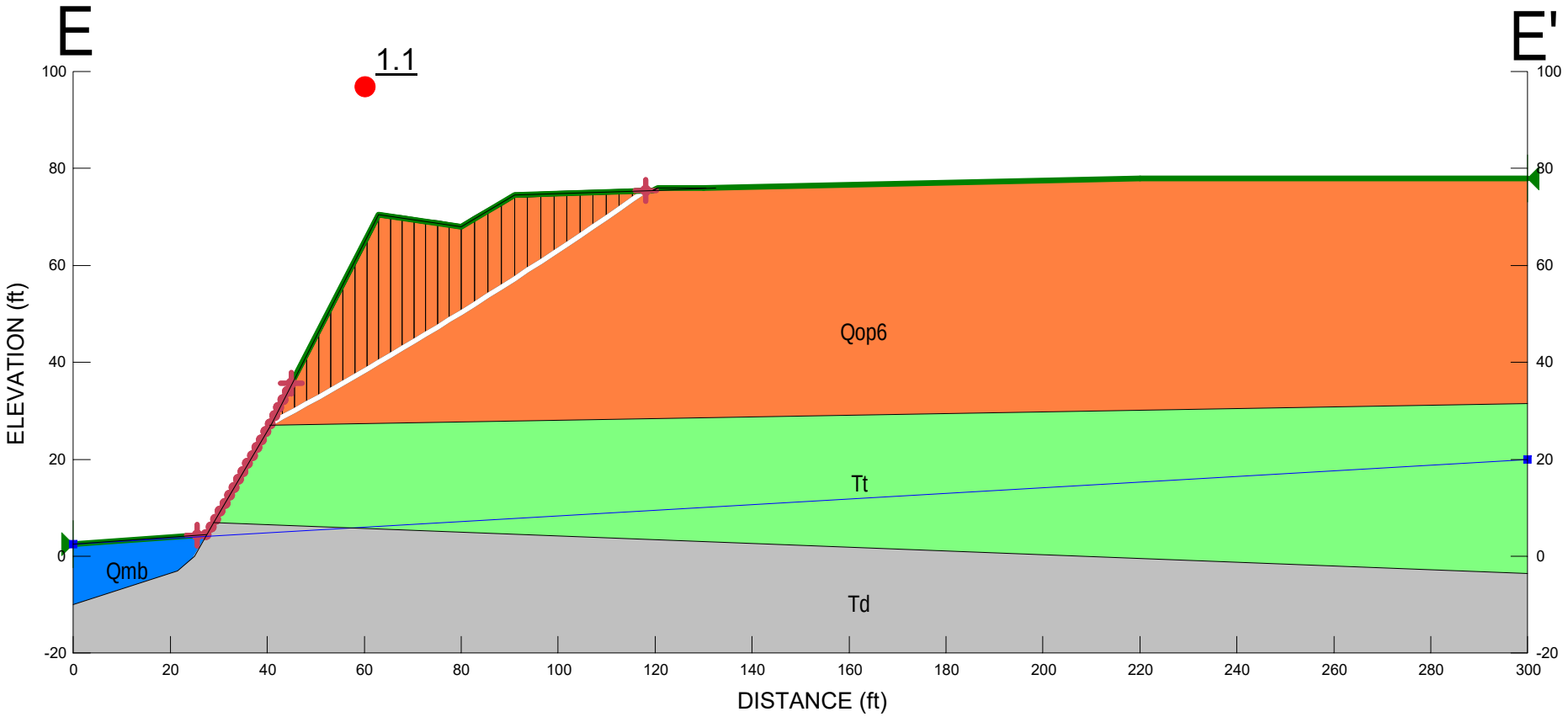

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Figure C-46

The Resort at Del Mar
Project No. G1710-32-04
Section F-F'
Name: FFc1s.gsz
Date: 08/30/2019 Time: 11:04:14 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qbp - Brush Pile	100	0	2
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

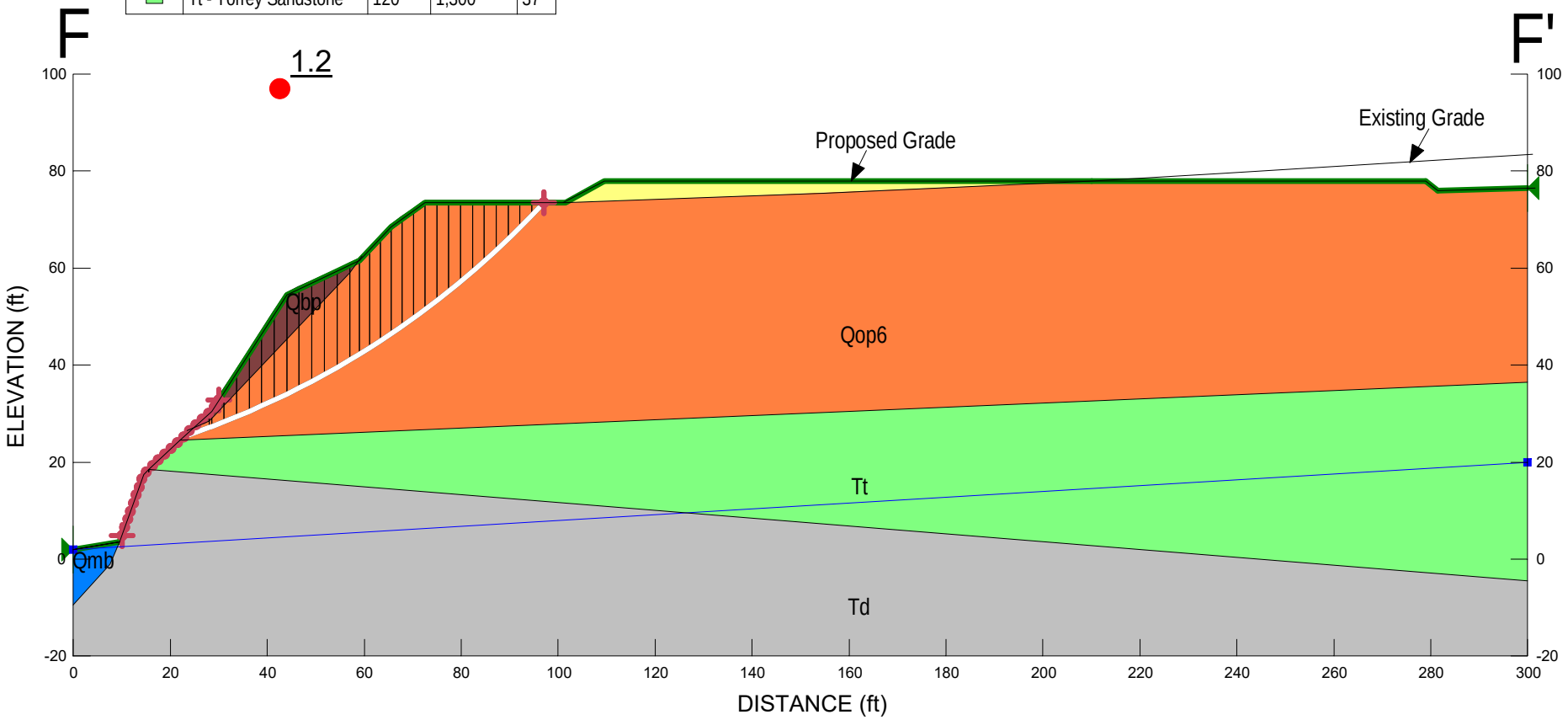

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Figure C-47

The Resort at Del Mar
Project No. G1710-32-04
Section G-G'
Name: GGc1s.gsz
Date: 08/30/2019 Time: 11:06:33 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

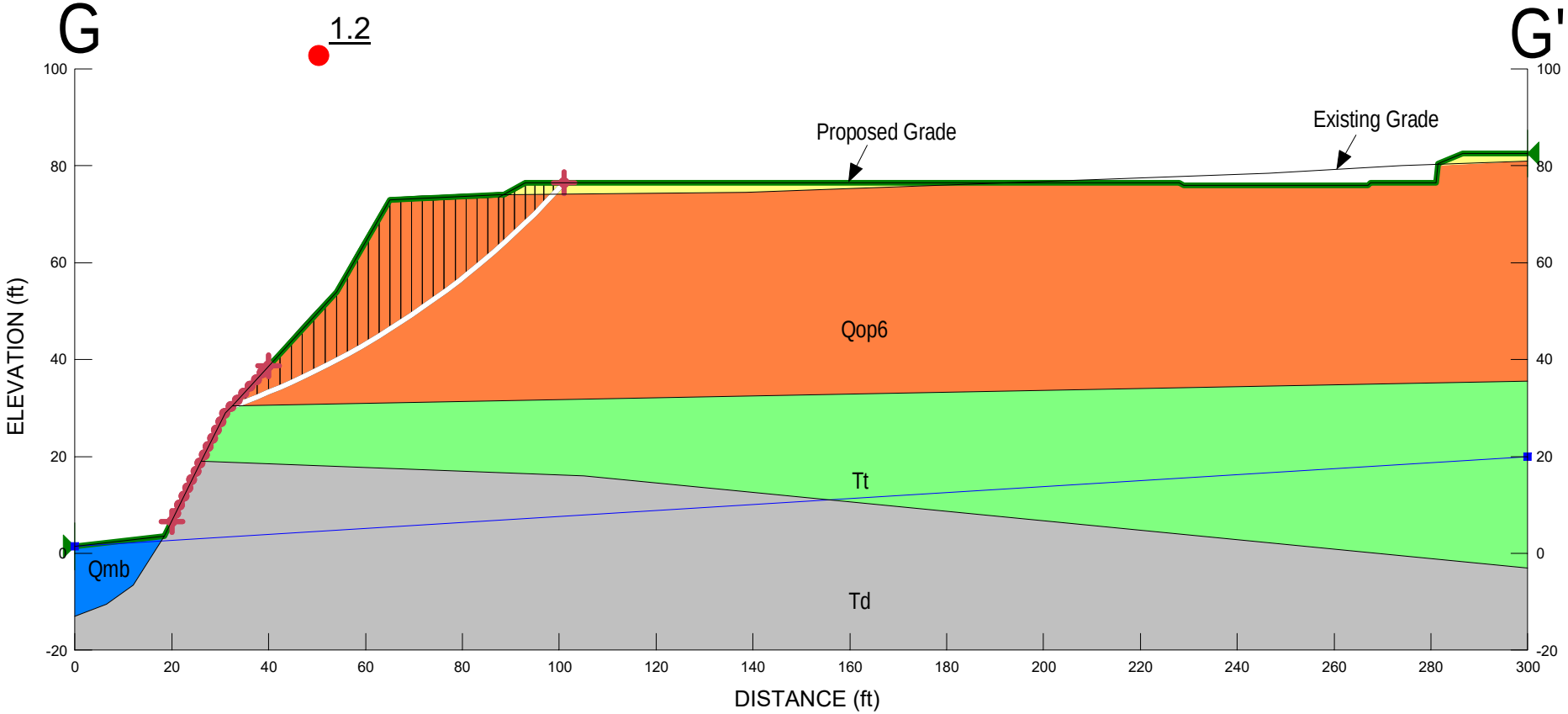

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Figure C-48

The Resort at Del Mar
Project No. G1710-32-04
Section H-H'
Name: HHc1s.gsz
Date: 08/30/2019 Time: 11:08:07 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

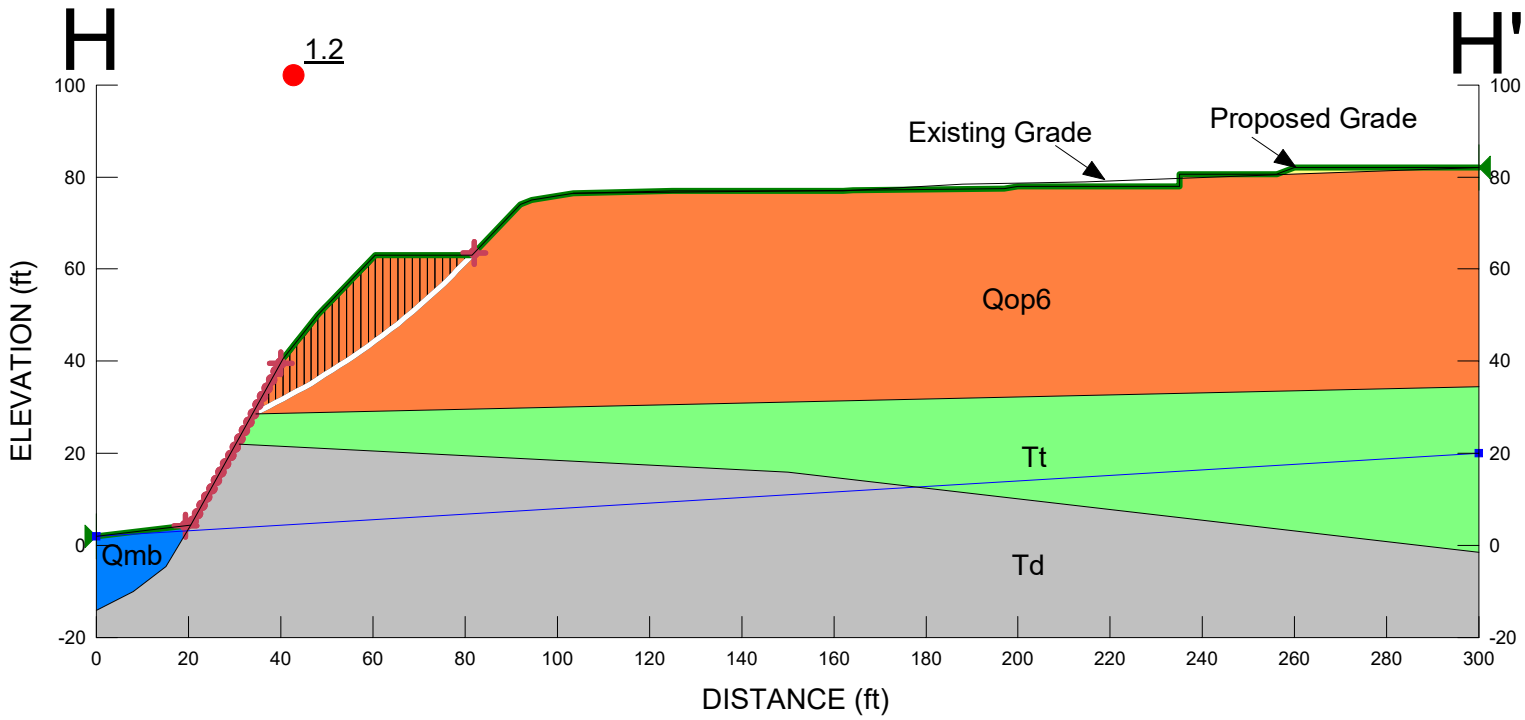

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Figure C-49

The Resort at Del Mar
Project No. G1710-32-04
Section I-I'
Name: IIc1s.gsz
Date: 08/30/2019 Time: 11:10:32 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

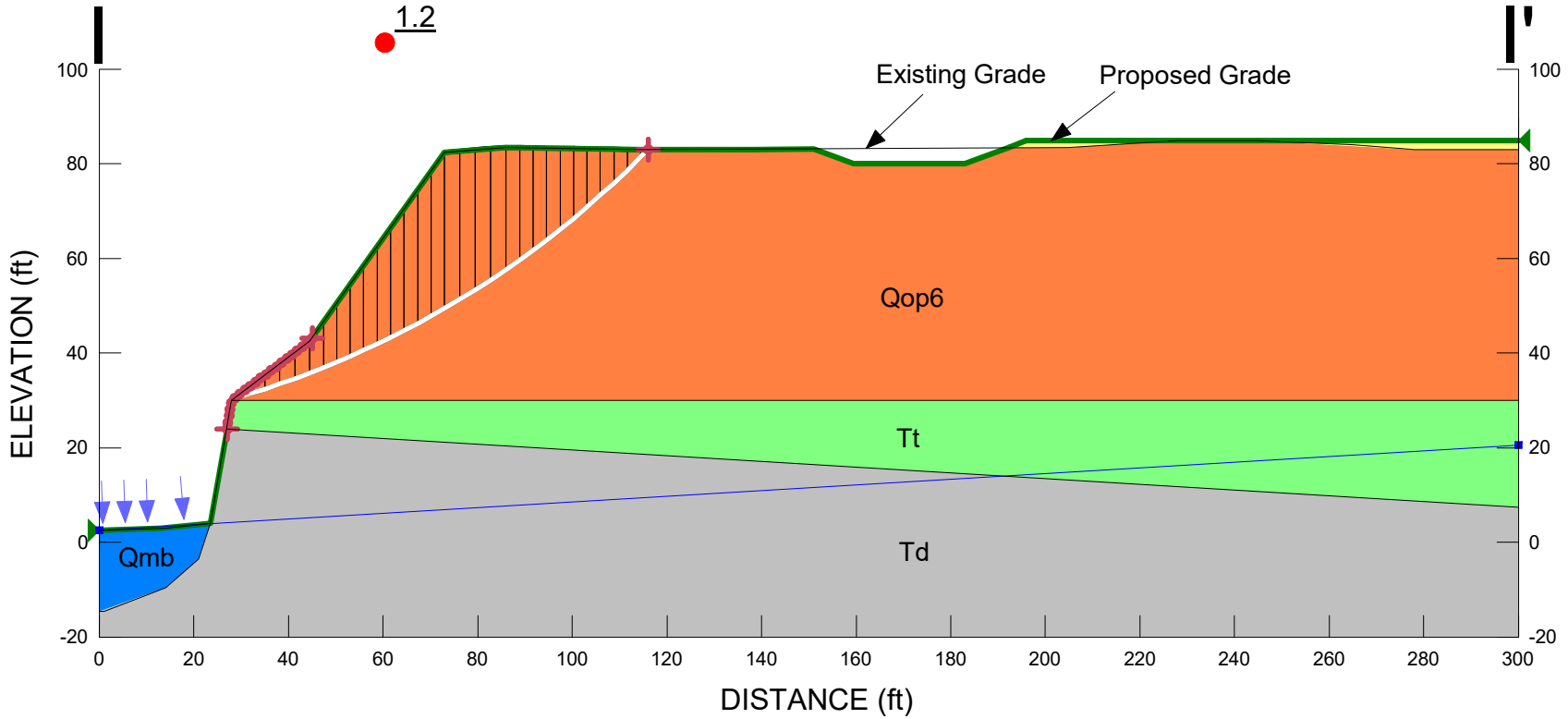

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Figure C-50

The Resort at Del Mar
Project No. G1710-32-04
Section J-J'
Name: JJc1s.gsz
Date: 08/30/2019 Time: 11:12:28 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

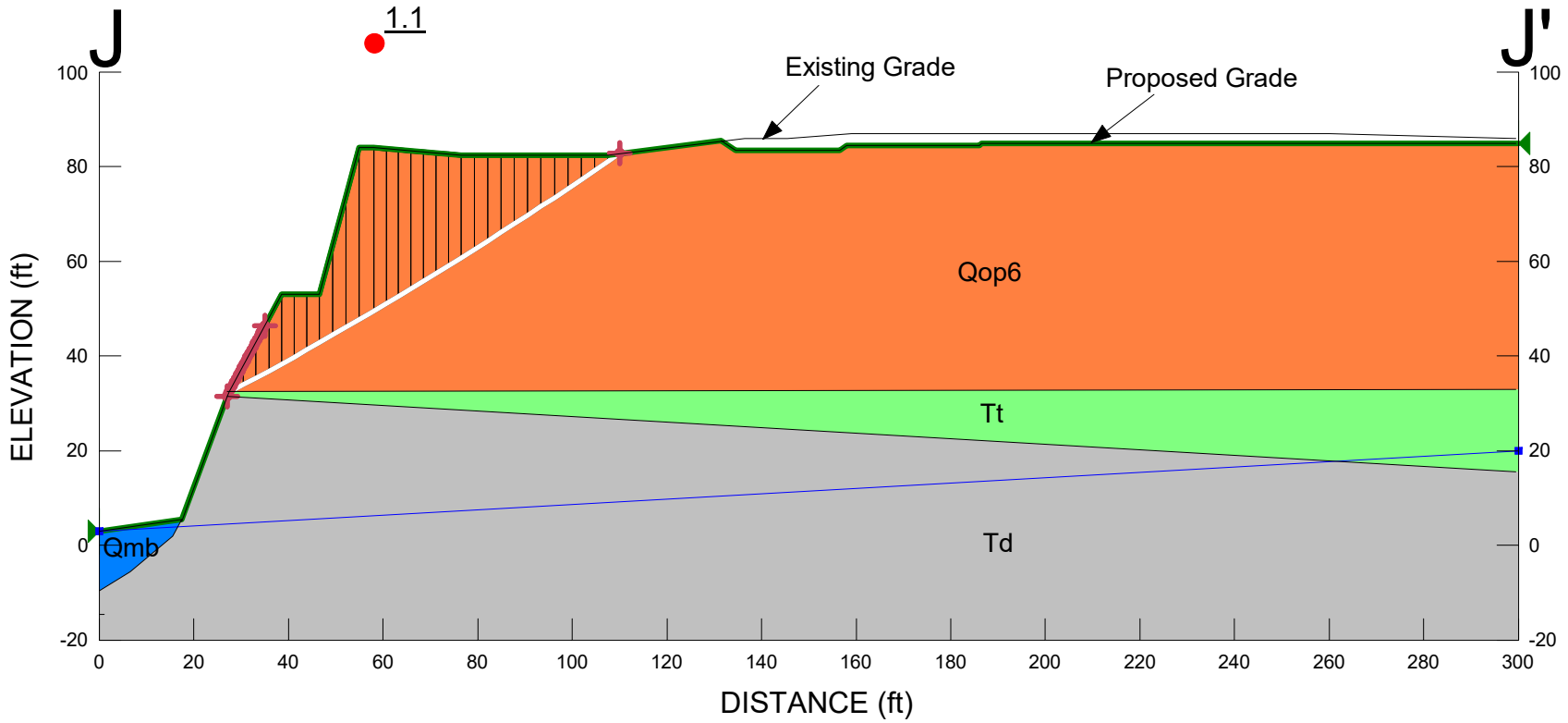

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Figure C-51

The Resort at Del Mar
Project No. G1710-32-04
Section K-K'
Name: KKc1s.gsz
Date: 08/30/2019 Time: 11:14:03 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

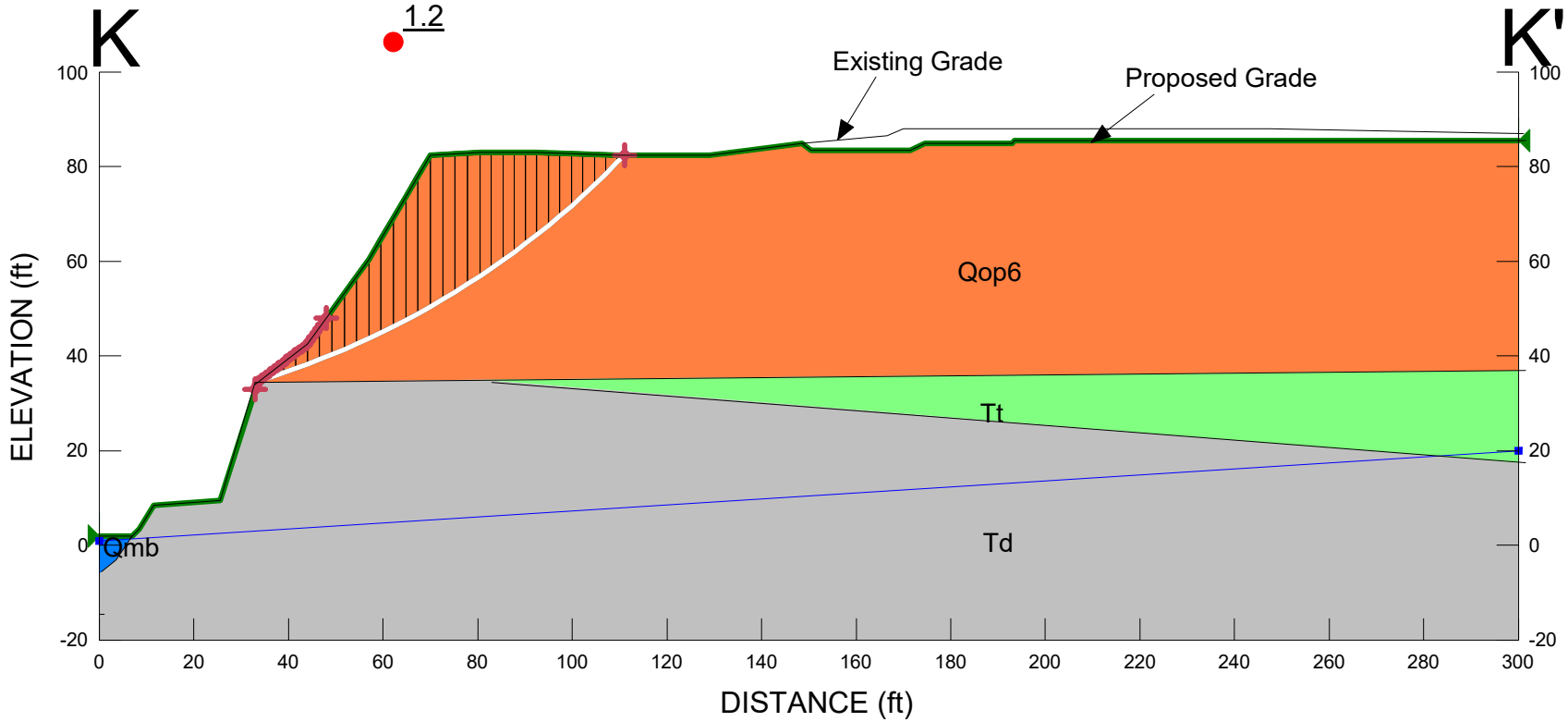

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Figure C-52

The Resort at Del Mar
Project No. G1710-32-04
Section L-L'
Name: LLc1s.gsz
Date: 08/30/2019 Time: 11:24:30 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

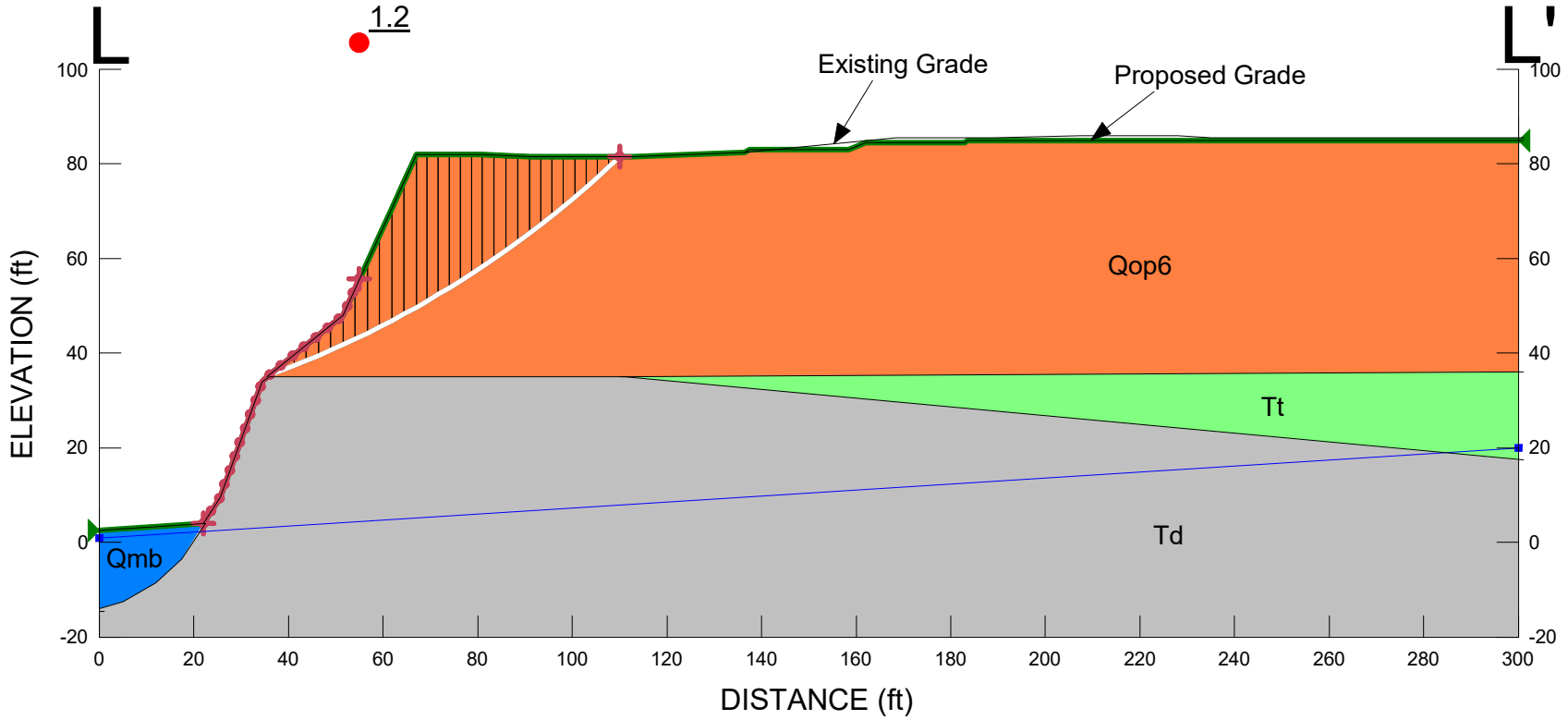

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Figure C-53

The Resort at Del Mar
Project No. G1710-32-04
Section M-M'
Name: MMc1s.gsz
Date: 08/30/2019 Time: 11:26:36 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

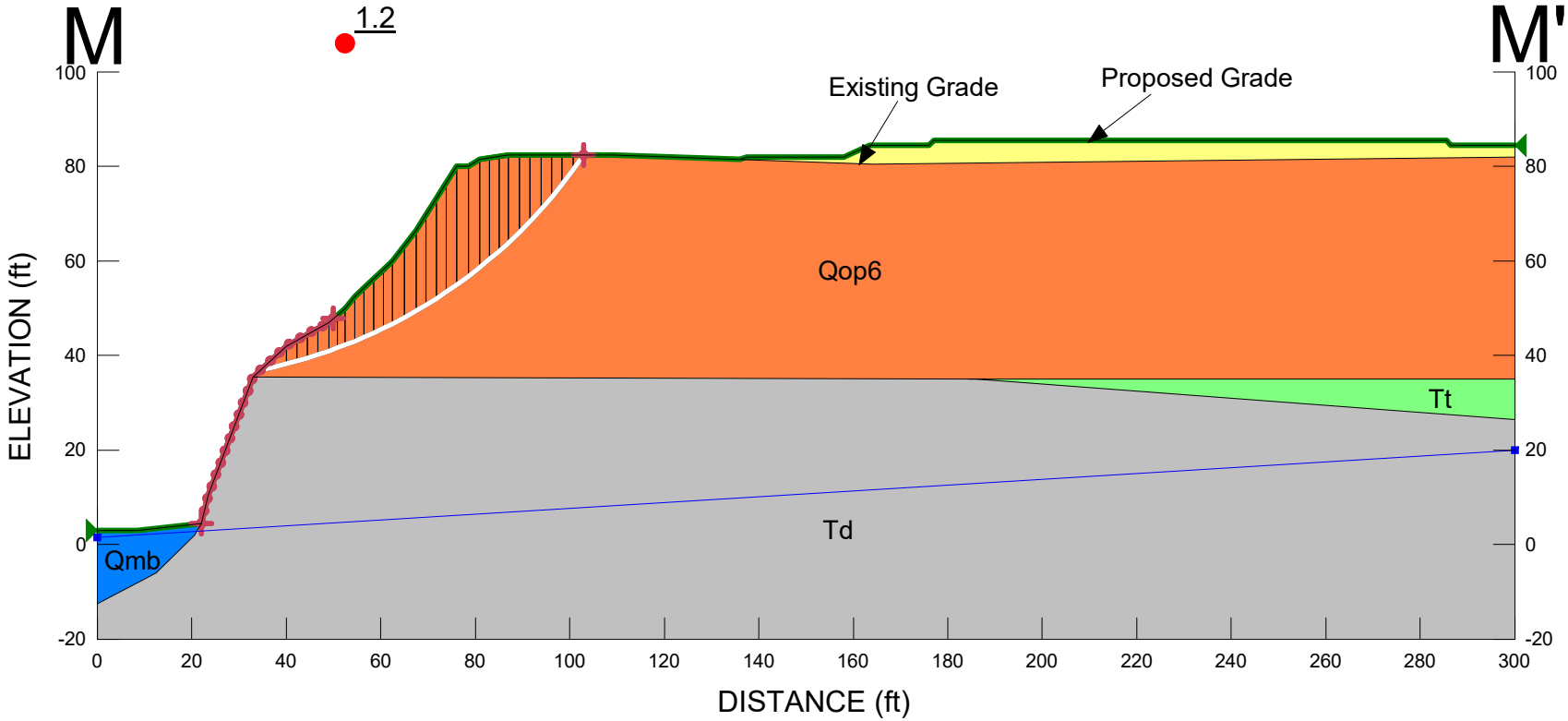

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Figure C-54

The Resort at Del Mar
Project No. G1710-32-04
Section N-N'
Name: NNc0s.gsz
Date: 08/30/2019 Time: 11:28:30 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

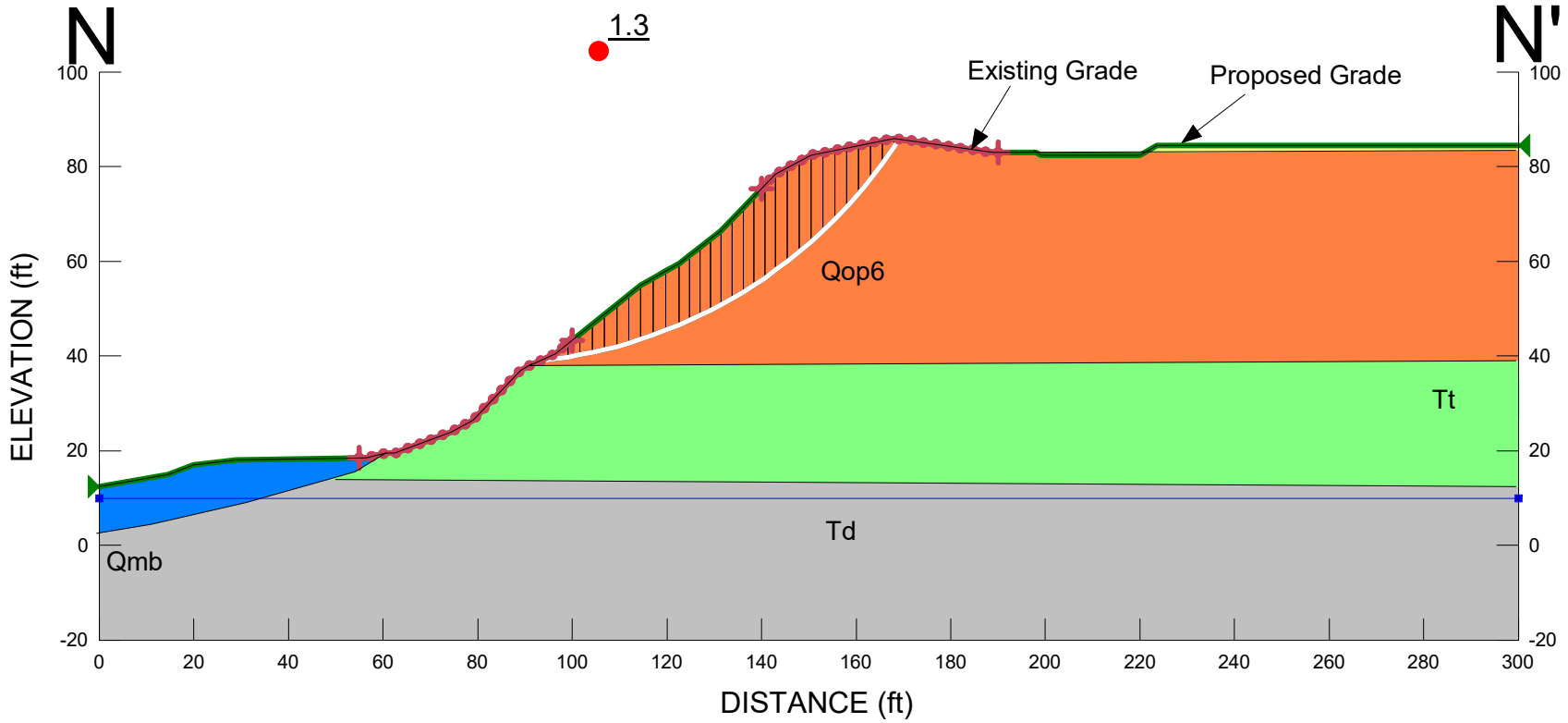

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Figure C-55

The Resort at Del Mar
Project No. G1710-32-04
Section O-O'
Name: OOc0s.gsz
Date: 08/30/2019 Time: 11:30:17 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

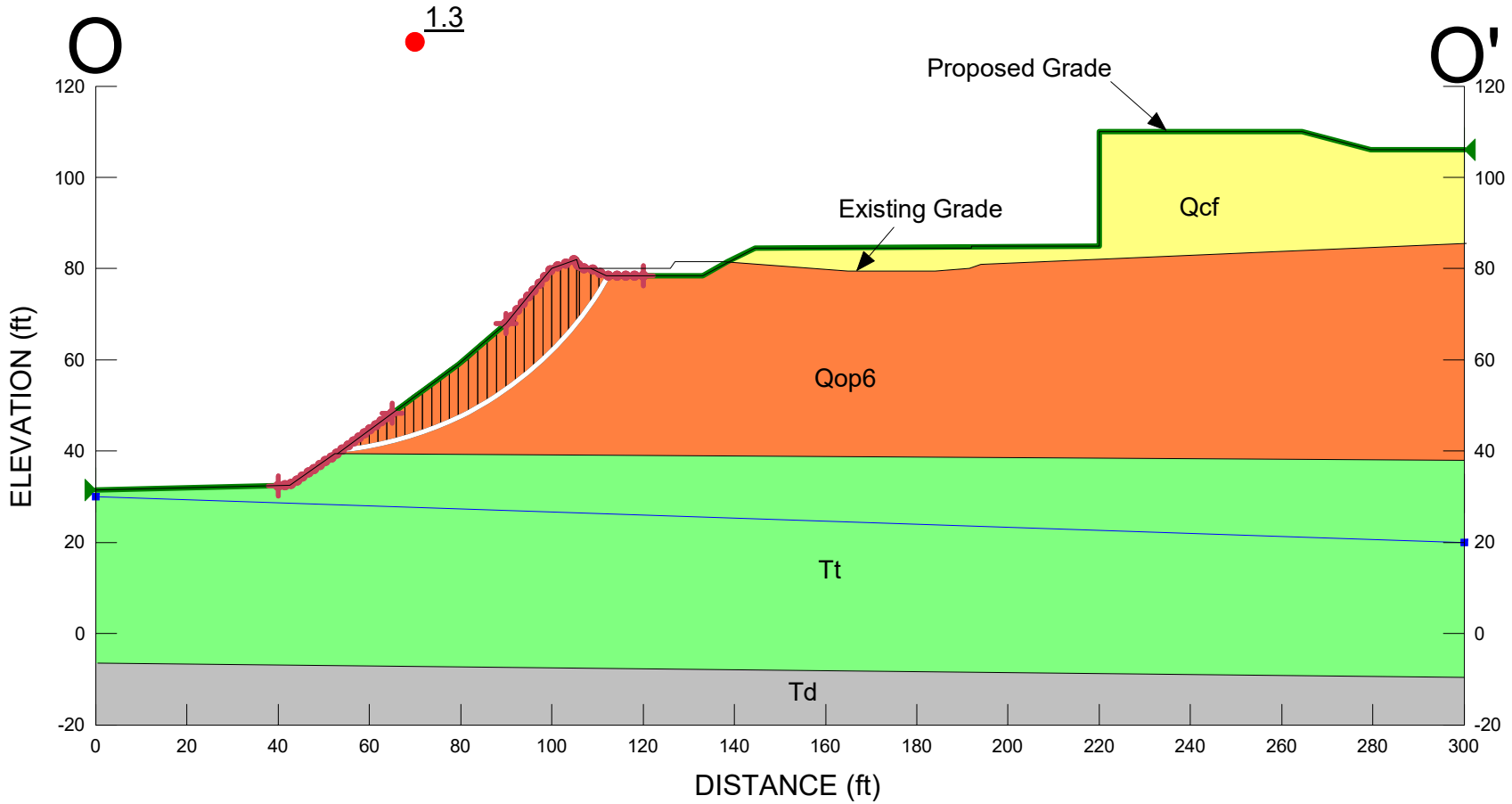

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Figure C-56

The Resort at Del Mar
Project No. G1710-32-04
Section P-P'
Name: PPc0s.gsz
Date: 08/30/2019 Time: 11:31:59 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

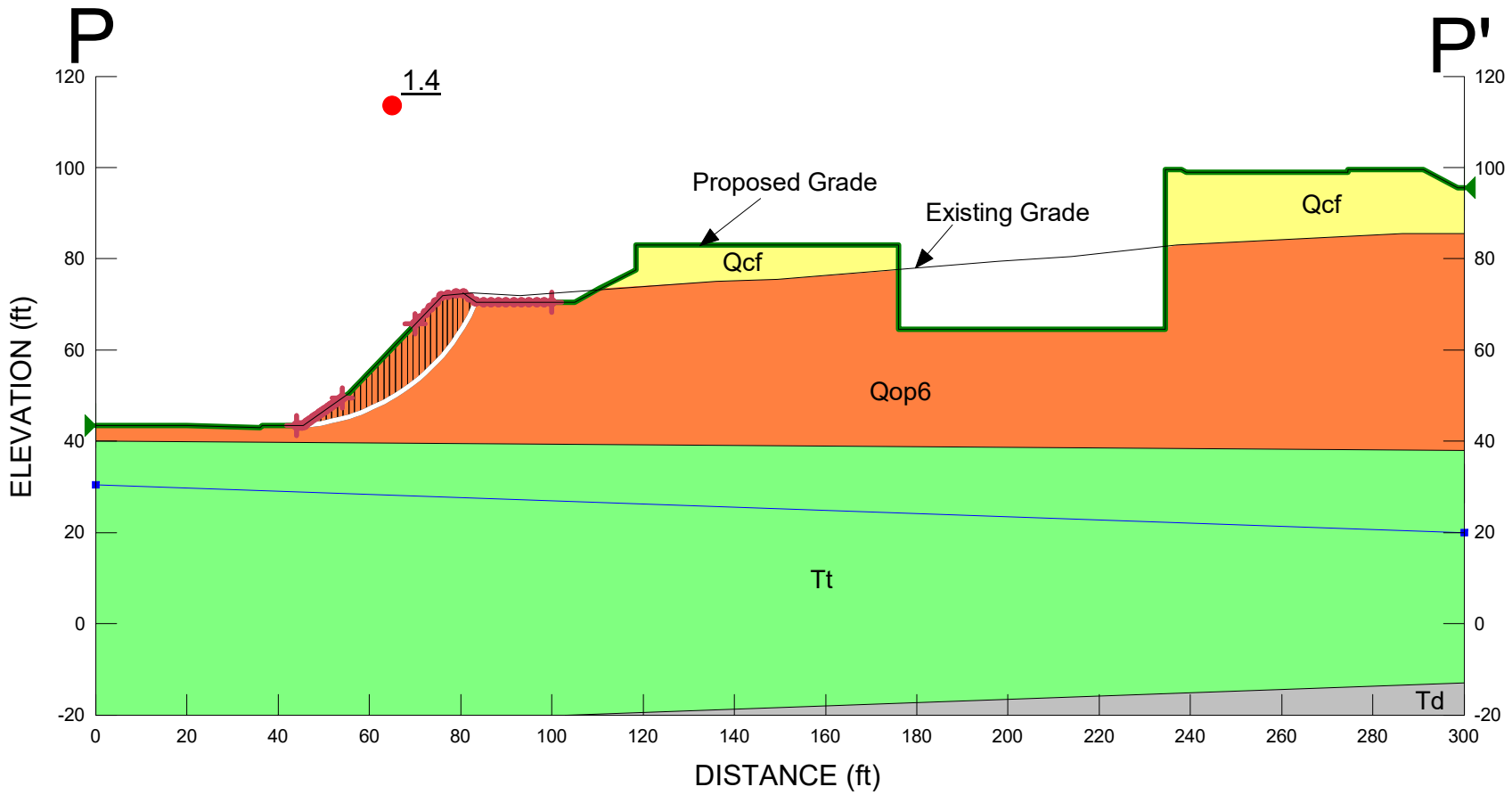

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Figure C-57

The Resort at Del Mar
Project No. G1710-32-04
Section Q-Q'
Name: QQc1s.gsz
Date: 08/30/2019 Time: 11:34:05 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

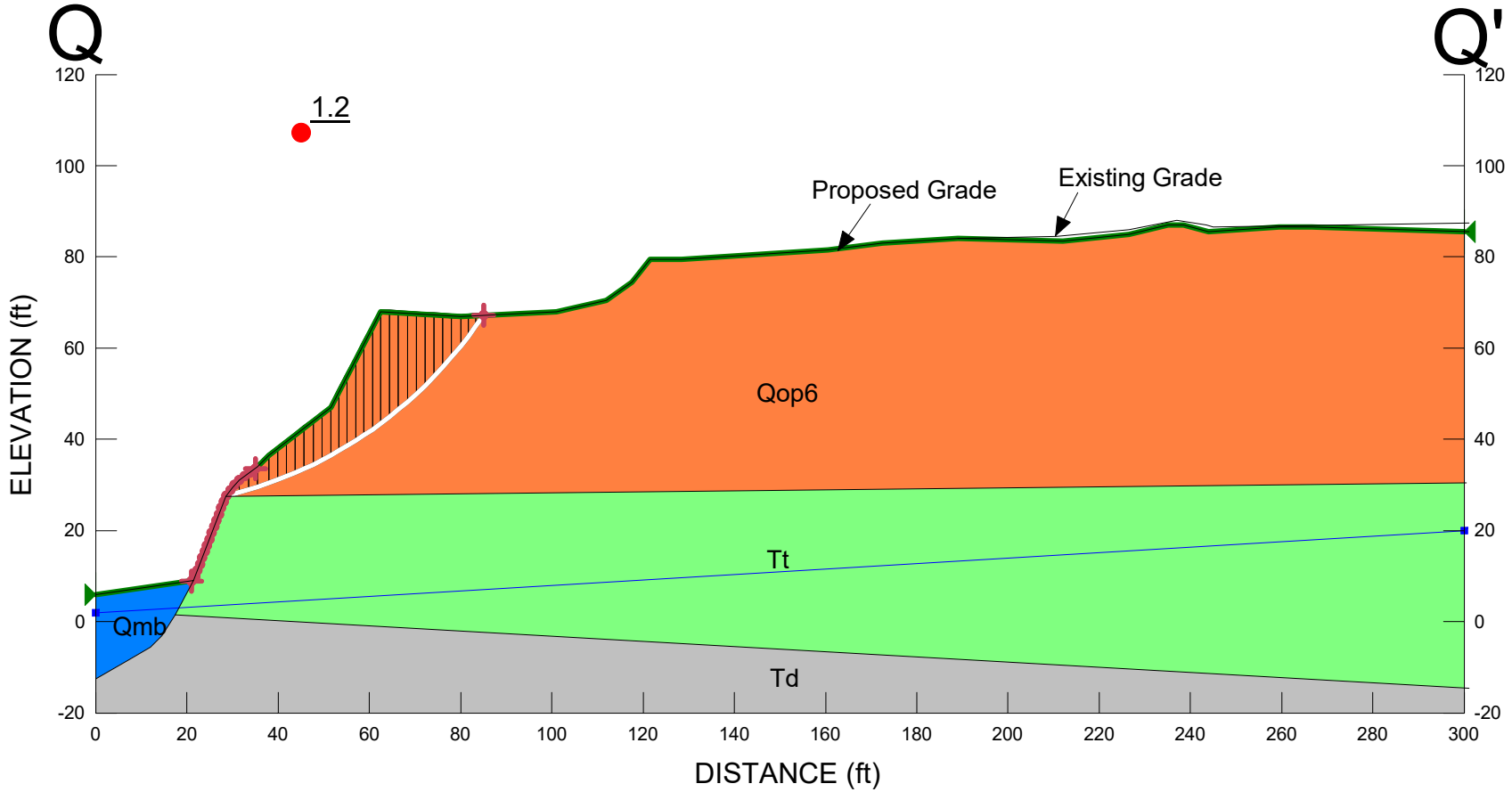

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Figure C-58

The Resort at Del Mar
Project No. G1710-32-04
Section R-R'
Name: RRc0s.gsz
Date: 08/30/2019 Time: 11:50:06 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qbp - Brush Pile	100	0	2
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

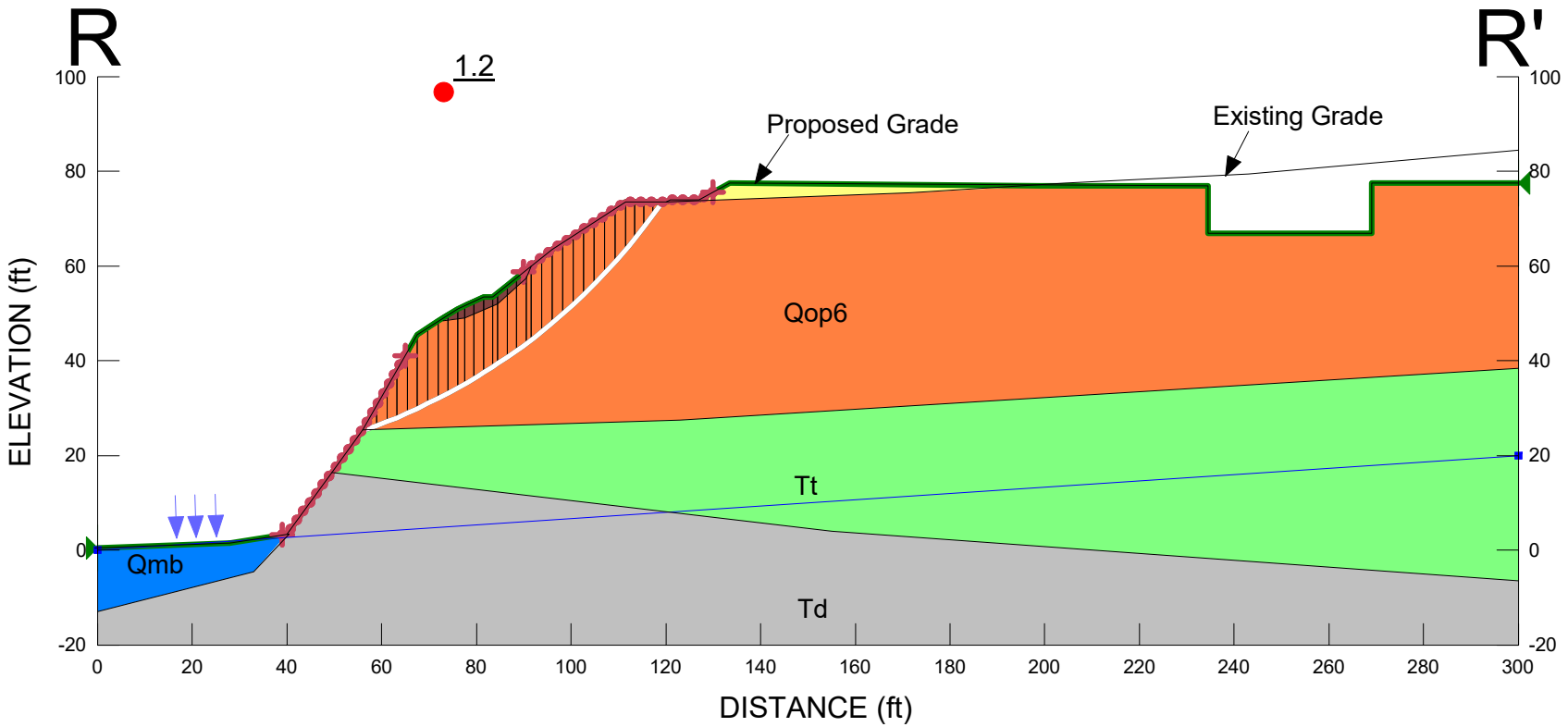

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Figure C-59

The Resort at Del Mar
Project No. G1710-32-04
Section S-S'
Name: SSc1s.gsz
Date: 08/30/2019 Time: 11:52:05 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

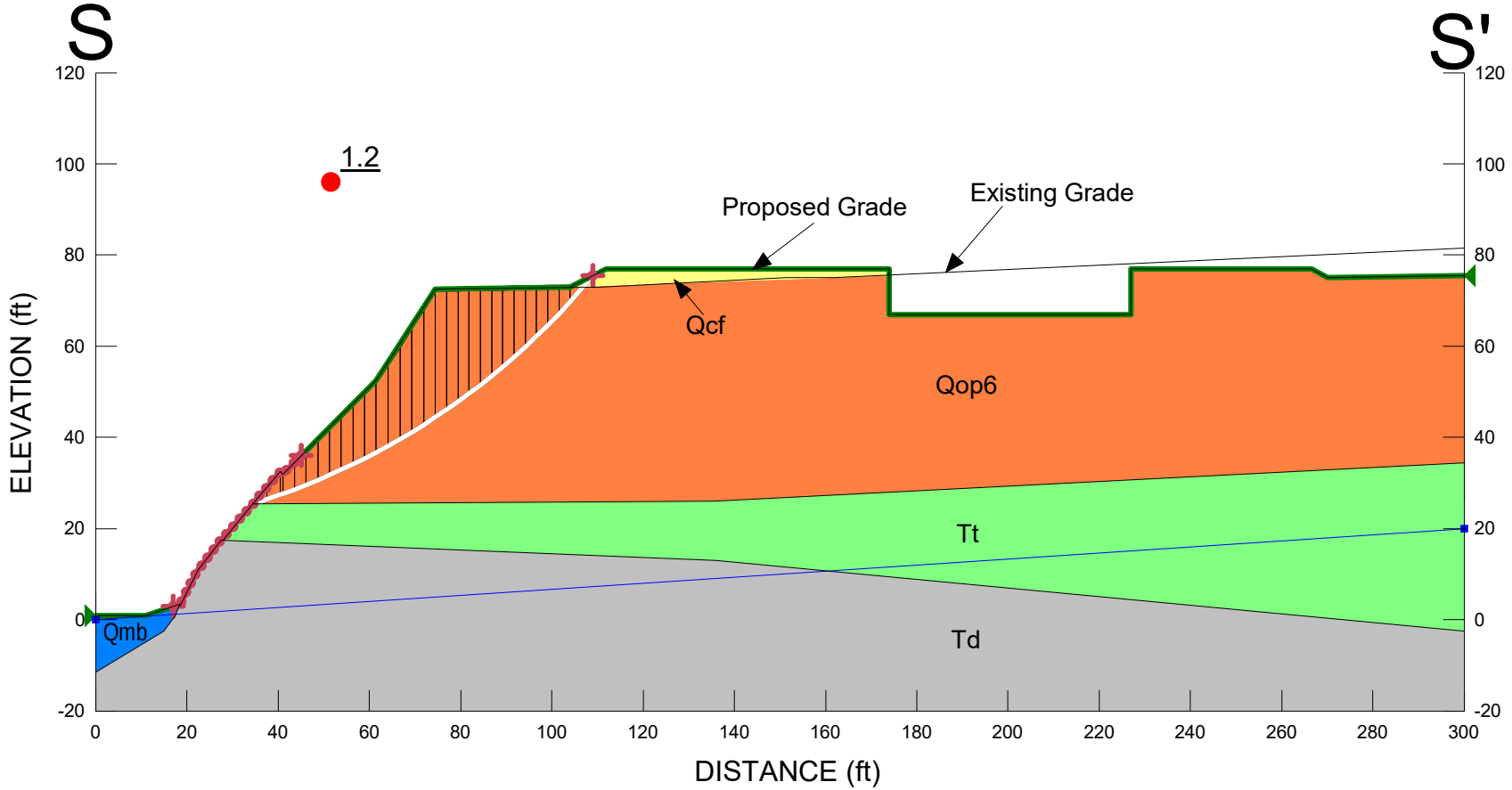

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Figure C-60

The Resort at Del Mar
Project No. G1710-32-04
Section T-T'
Name: TTc1s.gsz
Date: 08/30/2019 Time: 11:53:45 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

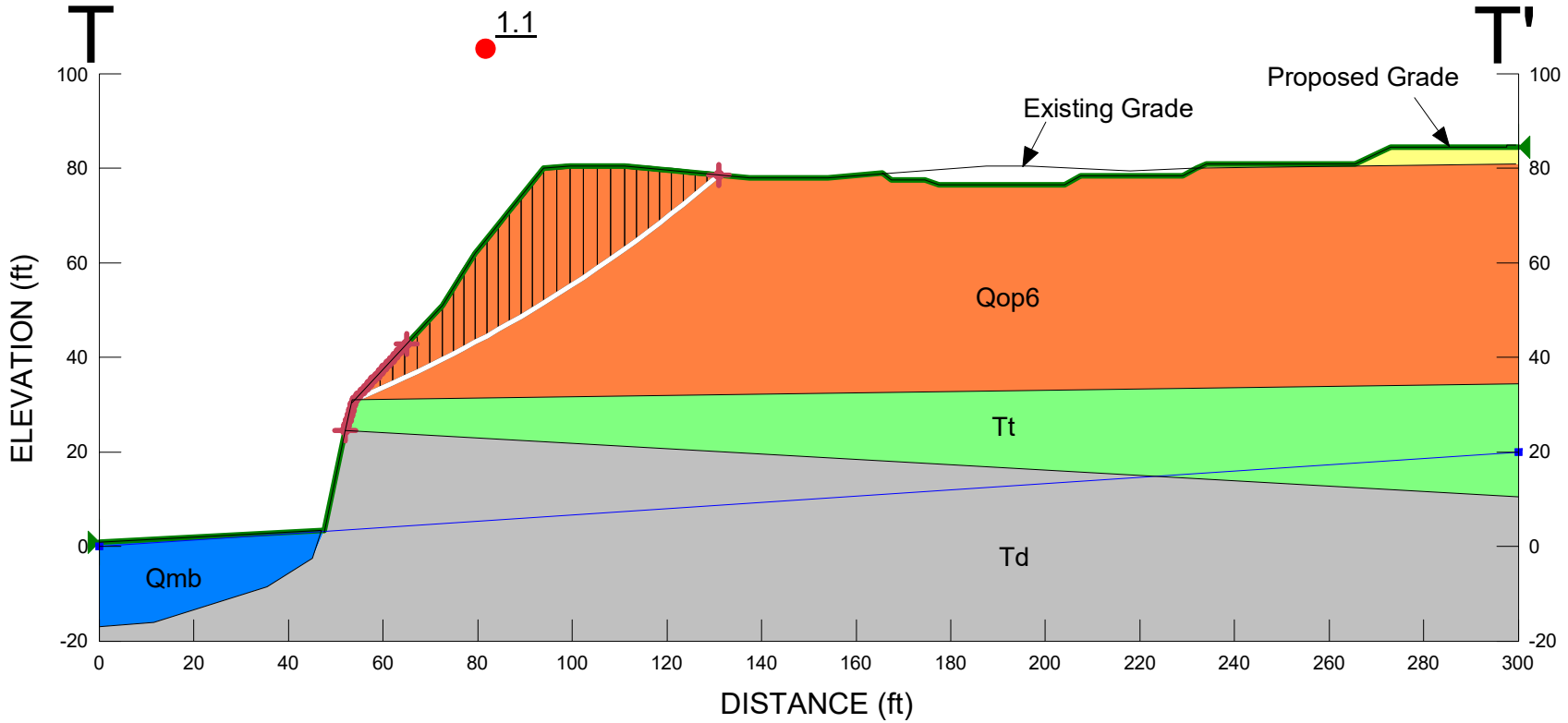

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Figure C-61

The Resort at Del Mar
Project No. G1710-32-04
Section U-U'
Name: UUc1s.gsz
Date: 08/30/2019 Time: 11:55:13 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

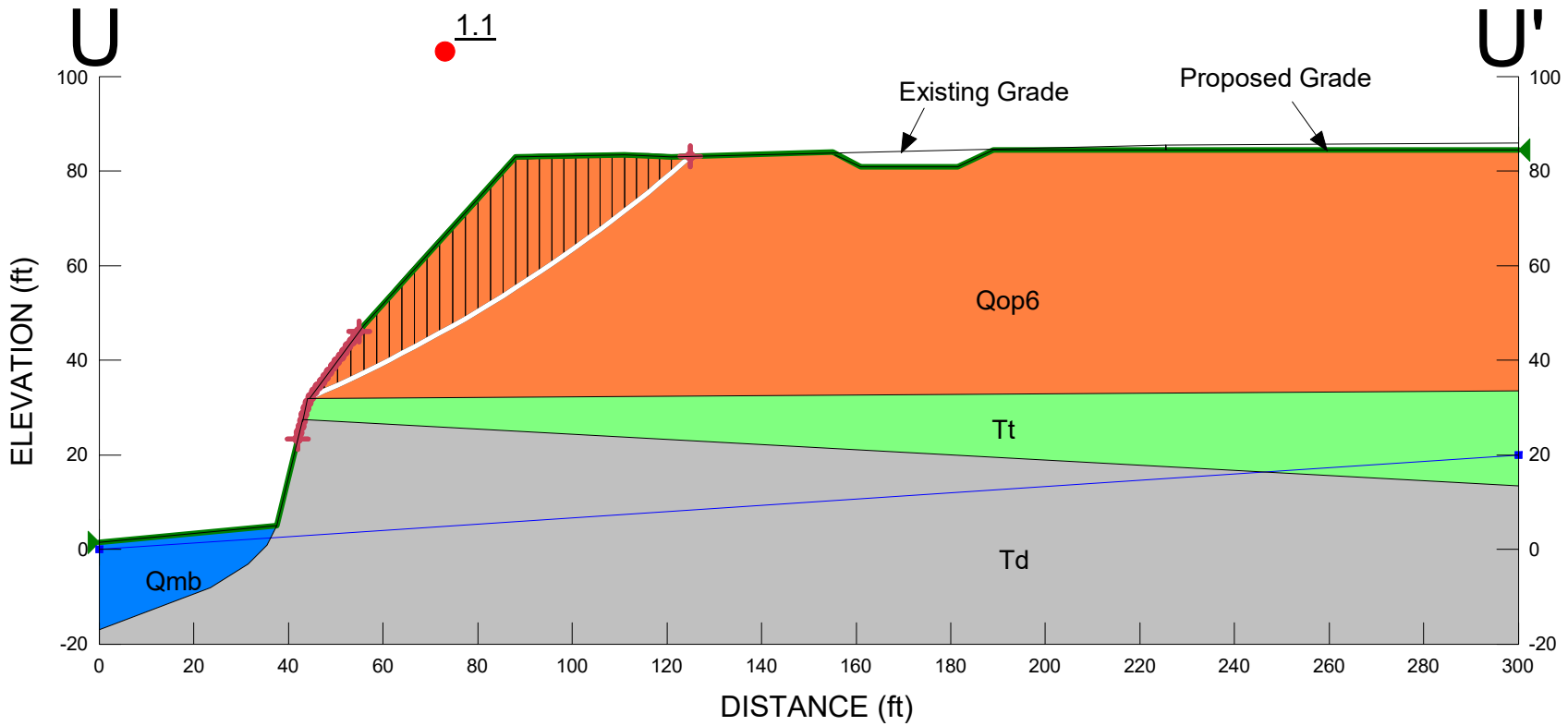

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Figure C-62

The Resort at Del Mar
Project No. G1710-32-04
Section V-V'
Name: VVc1s.gsz
Date: 08/30/2019 Time: 11:56:31 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

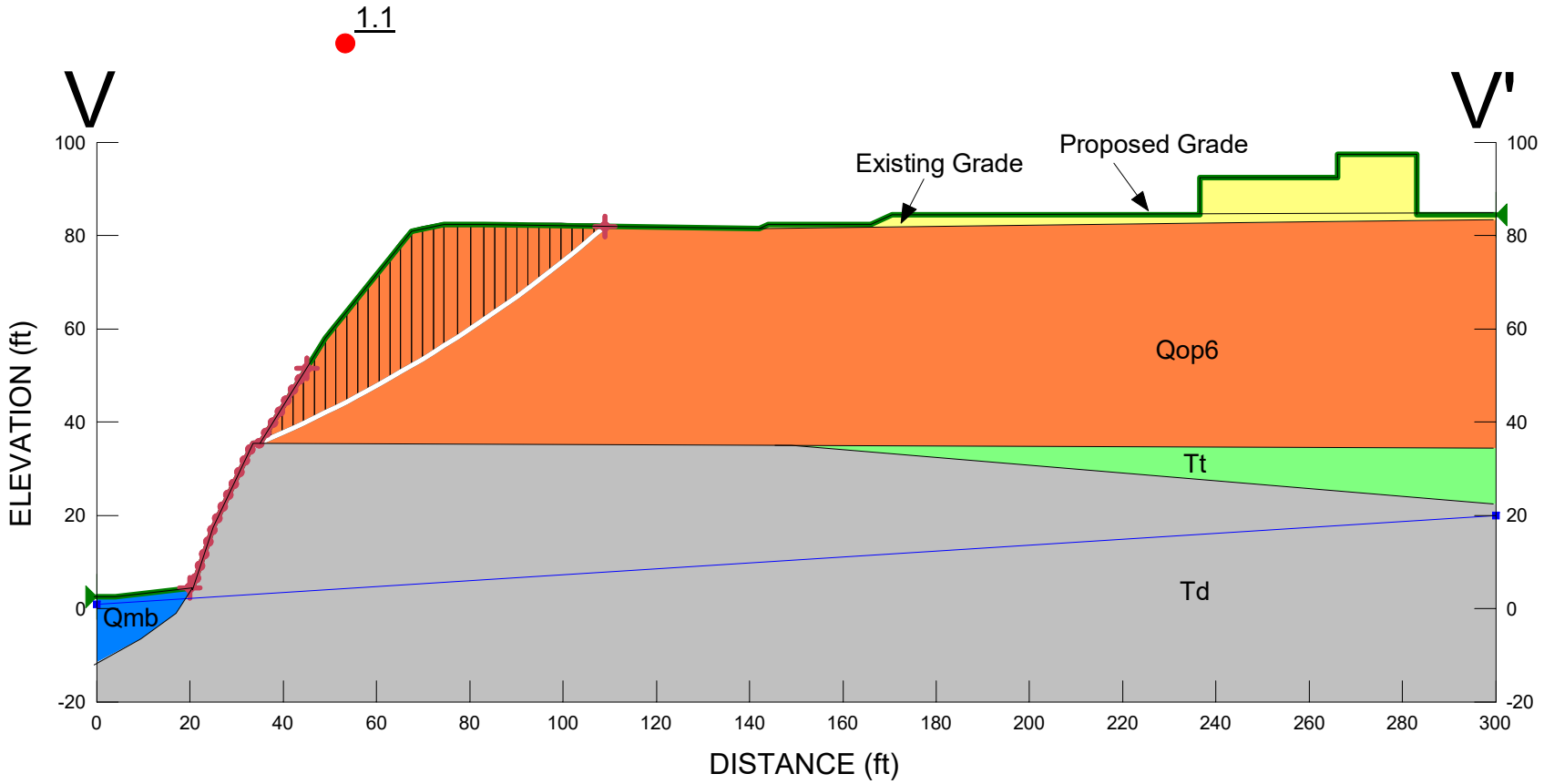

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Figure C-63

The Resort at Del Mar
Project No. G1710-32-04
Section W-W'
Name: WWc0s.gsz
Date: 08/30/2019 Time: 11:57:57 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

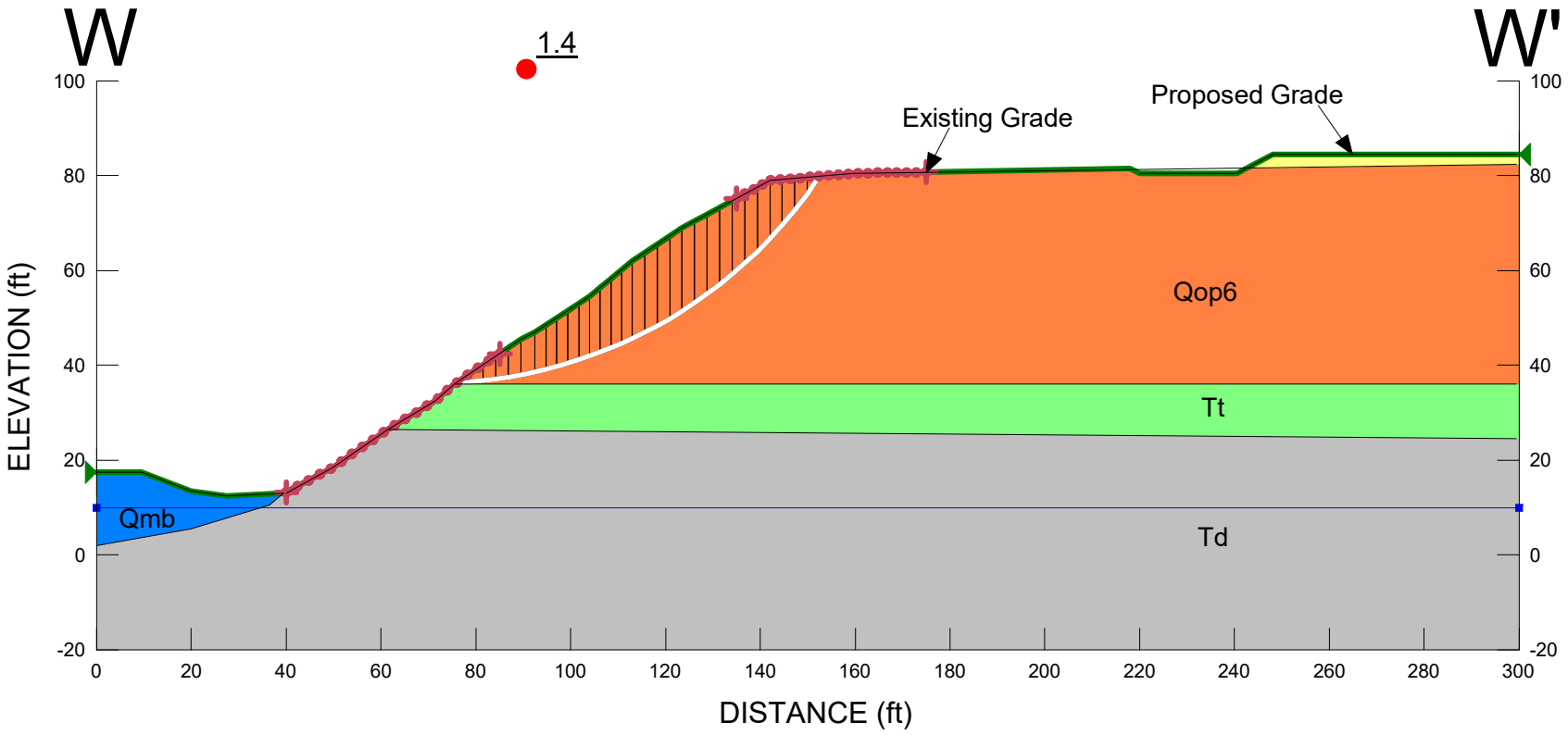

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Figure C-64

The Resort at Del Mar
Project No. G1710-32-04
Section X-X'
Name: XXc0s.gsz
Date: 08/30/2019 Time: 11:59:41 AM

Proposed Condition

Seismic Analysis
keq = 0.15g

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	Qcf - Compacted Fill	125	300	28
	Qmb - Beach Deposits	120	0	28
	Qop6 - Terrace Deposits	110	300	34
	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

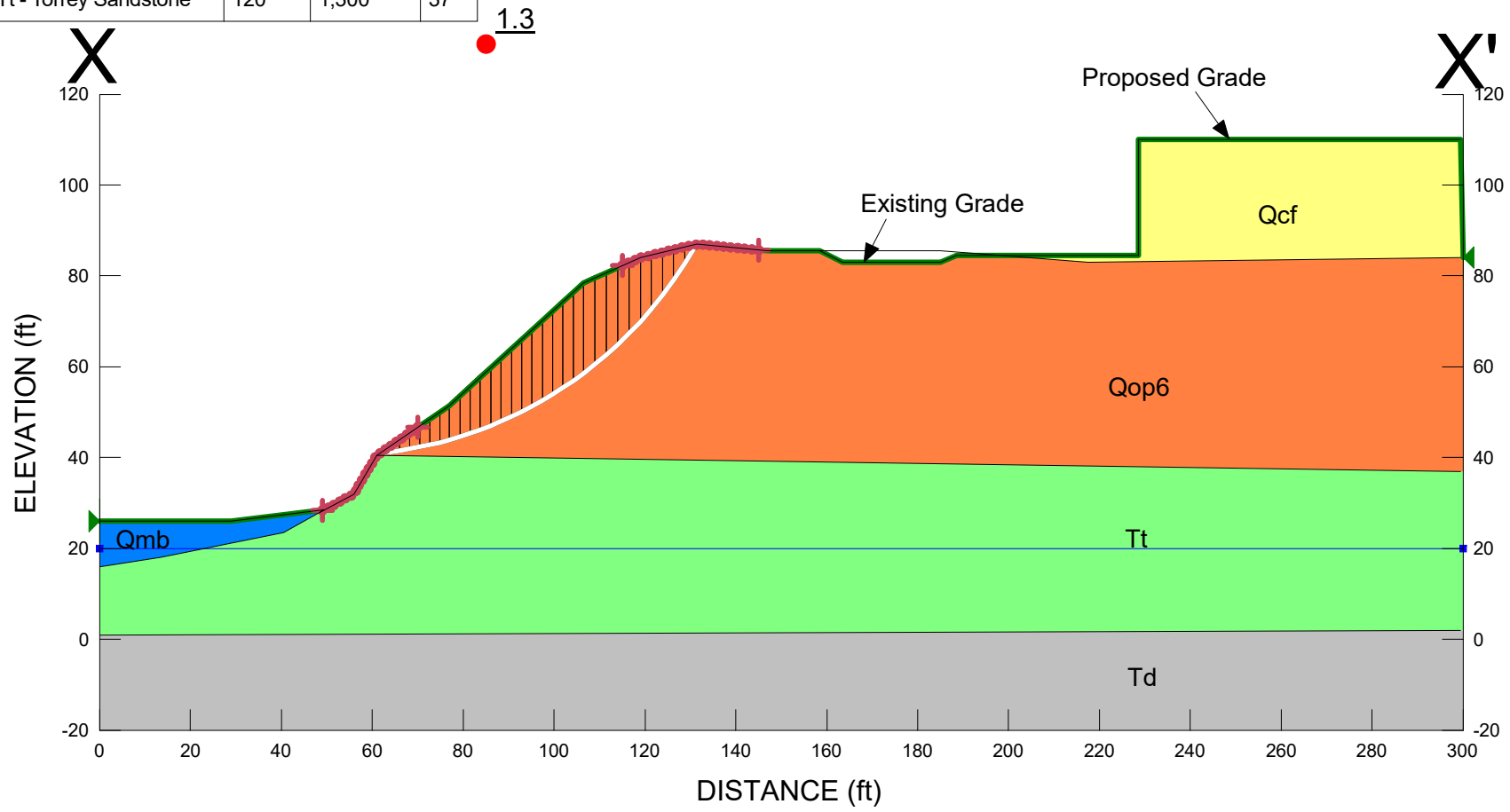

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Figure C-65

The Resort at Del Mar
Project No. G1710-32-04
Section Y-Y'
Name: YYc0s.gsz
Date: 08/30/2019 Time: 12:01:17 PM

Proposed Condition

Seismic Analysis
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Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf - Compacted Fill	125	300	28
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	Td - Del Mar Formation	130	1,700	39
	Tt - Torrey Sandstone	120	1,300	37

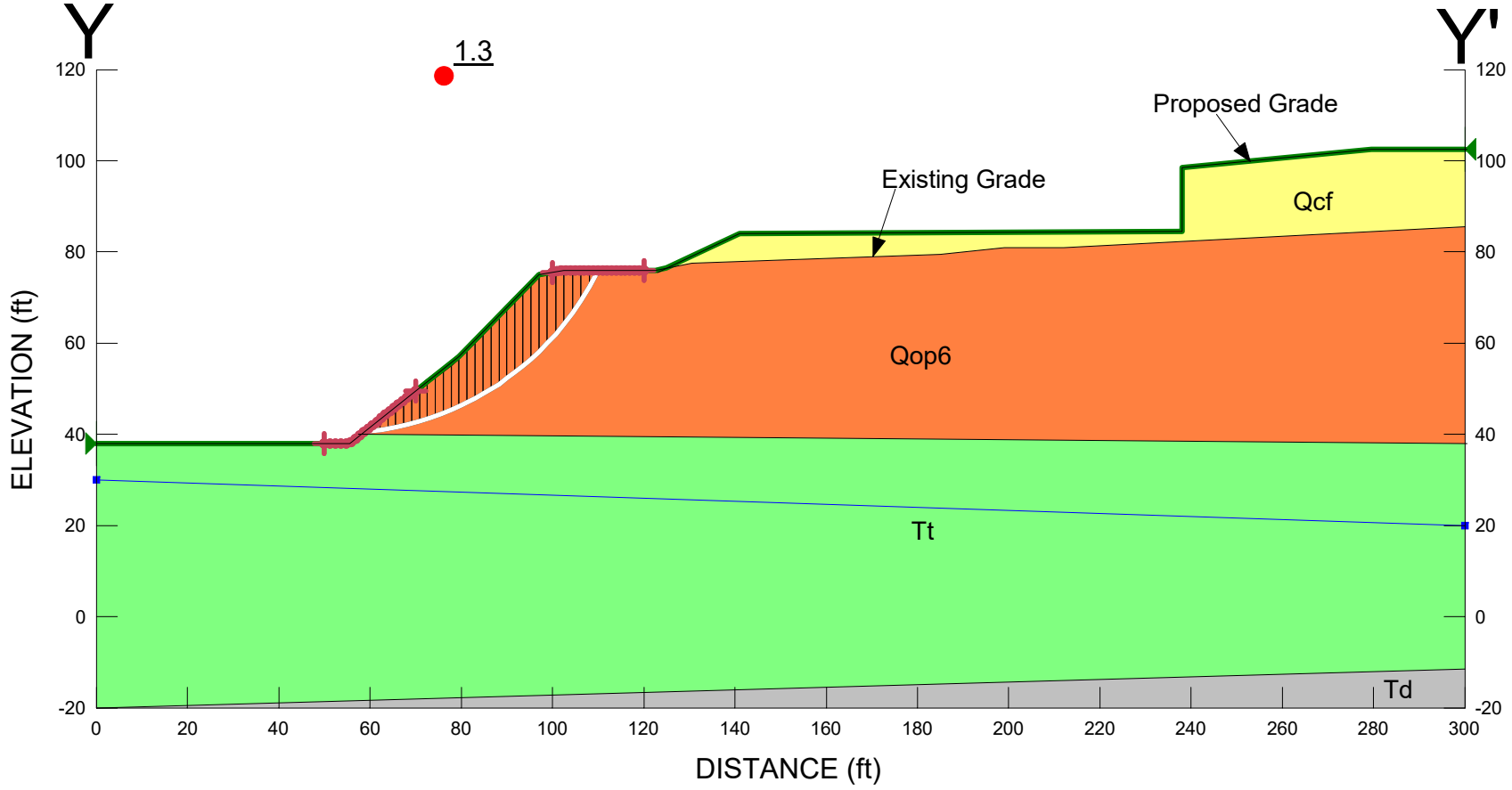

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Figure C-66

APPENDIX D

APPENDIX D

BLUFF RETREAT ANALYSIS
PERFORMED BY MR. MICHAEL HART, C. E. G. 706

FOR

MARISOL
DEL MAR, CALIFORNIA

PROJECT NO. G1710-32-04

Historic Bluff Edge Retreat

We have calculated historic bluff edge retreat by two methods; first we compared and measured the distance between the foundations of a gazebo visible on 1953 aerial photographs and the top of bluff as it currently exists and the bluff edge in 1953. Second, average bluff recession was measured for the entire 1,500 (+/-) feet length of the bluff from Border Avenue to the southern property limits by photogrammetric methods. To accomplish this task, Project Design Consultants (PDC) was provided with two digital aerial tiff images dated 1953. The images were flown with 60% overlap at approximately 15,000 feet altitude. The 1953 images were processed using photogrammetric methods and set up in a modern digital 3D stereo plotter. The 1953 stereo model was scaled and leveled as a means of control by comparing common ground features found in the 1953 flight that still exist today. After scaling and leveling the model, the image was viewed and compared to the 2016 Del Mar CAD file as a quality control method. Once the 1953 model was determined to be properly set in the stereo plotter the top and toe of the bluff was carefully traced in CAD defining the 1953 bluff line for the exhibit shown on Figure 12. Project Design Consultants were not only able to compare the 1953 bluff line with the bluff line as it existed in 2016 but also the bluff edge as it existed in 1986 as determined from the City of Del Mar Beach Overlay Zone.

The average rate of bluff retreat was then calculated from 30 measuring points located at approximately 50 ft intervals along the edge of the bluff. We then scaled the distance from the 1953 and 1986 bluff edges to the current (2016) top of bluff. The average bluff recession rate was then determined by averaging the measurements. These calculations yielded an average rate of bluff recession between 1953 and the present of 0.16 ft./yr. and 0.13 ft./yr. between 1986 and the present. There is one area in the northern portion of the bluff at the southwest corner of Parcel A where the 1986 position of the bluff edge plots seaward of the 1953 bluff edge. We attribute this anomaly to an original error in the City of Del Mar Beach overlay Zone plot that does not accurately depict the topography of the re-entrant in the bluff at that location.

The above averages determined from photogrammetric methods agree well with an important physical measurement taken on the ground between the bluff top gazebo that was constructed prior to 1953 and the bluff edge utilizing the diameter of the gazebo as a scale. Utilizing the 15 ft. diameter gazebo, the distance from the bluff edge in 1953 to the western edge of the gazebo is calculated to have been 10 feet (+/- 1'). The foundation of the original gazebo still exists on the edge of the bluff as shown on the photograph below. Currently, the foundation extends two feet over the bluff top. These measurements indicate that the bluff edge in the area of the gazebo has retreated 12 feet since 1953 or an average of 0.19 ft./yr., the same distance for this location determined by Project Design Consultants by photogrammetric methods. For our determination of future bluff retreat we have adopted the more

conservative rate determined from the gazebo to bluff edge that is slightly higher than the average rate of 0.16 ft./yr. determined by photogrammetric methods for the entire 1500 feet long section of the bluff.

Figure 1. The original gazebo foundation (arrow) that now extends two feet beyond the edge of the bluff.

The calculation of approximately 0.19 feet per year also agrees with the amount of erosion that is estimated to have occurred since 1953 to two graded paths, or narrow roads down the face of the bluff that once existed below the gazebo and the northwest property corner. The upper portion of the more northerly of the two roads still exists near the top of the bluff.

Recent Published Bluff Erosion Rates

A recent study of bluff face retreat as opposed to bluff edge retreat, by Young and Ashford (2006) for a very short time interval between 1998 and 2007 indicated bluff face retreat over that period that averaged 13 cm/yr. (0.42 ft./yr). This was an average rate for all of the Solana Beach area and included areas of the bluff where the highly cemented and erosionally resistant Del Mar Formation is not present as it is in the southern half of the project site. They noted that the period of time included in their study was too brief to make long term projections.

A study of erosion rates for the San Diego County Coastline by Benumof and Griggs (1999 & 2000) where rates were determined using robust photogrammetric methods over the 1932-1994 time-frame, yielded mean recession rates of 0.27 ft/yr and 0.25 ft/yr, respectively, for the Solana Beach and Encinitas areas, both of which are comprised largely of Torrey Sandstone bedrock overlain by terrace deposits. Their erosion rate for the Solana Beach area, specifically the coastal cliffs just to the north of the proposed

project site, where the geologic conditions and bluff profiles are similar, is reasonably consistent with the results calculated for the subject property.

Projected Future Bluff Edge Retreat and Sea Level Rise

Current sea level rise along the San Diego coast as published by NOAA is 2.13 +/- 0.19 mm/yr. There are several published sets of curves that show the amount of sea level rise by year 2100 that range from approximately 12 to 80 cm (Figure 2.). There is little doubt that a rise in sea level will have an effect on the bluff erosion rate and there are a several published methods that attempt to predict the rate (Bray and Hooke (1997, Young and others, 2014). The formulas vary from too simplistic to too complex and are replete with variables that are extremely difficult to determine accurately. For this project, we recommend applying a safety factor of 1.5 to the historic erosion rate as suggested by California Coastal Commission guidelines to allow for uncertainty in predicting the potential effects of future sea level rise.

Recommended Setback for bluff erosion
Historic erosion rate- 0.19ft/yr X 70 yr project life = 13.3 ft X F.S. of 1.5 = total setback of 19.95 ft(or 20ft).
This setback is in addition to the setback required to meet bluff stability standards.

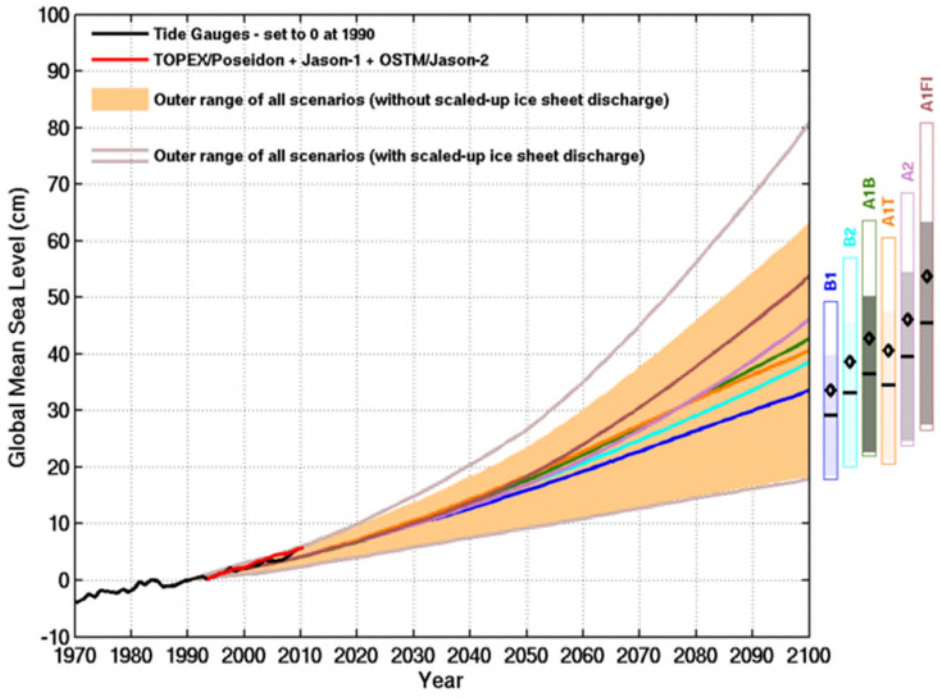

Figure 2. Mean sea level projections to Year 2100. (from CSIRO ACECRC, 2016)

Analysis of Potential effects of past and future El Nino Events on Bluff stability

An inspection of Figure 3 indicates that there have been at least 22 El Nino events varying from weak to very strong since 1951, several years before the date of the historic aerial photographs that were used

to determine the amount of bluff edge retreat. A comparison of Figure 3 with tidal curves for the El Nino years indicates that the strongest El Nino events result in an approximately 0.2 ft. increase in mean sea levels at San Diego that can last for several years. The calculation of bluff retreat incorporates a period of time that includes most of the El Nino events shown on Figure 3. Accordingly, the effect of any increased erosion/bluff edge retreat resulting from the El Nino events is automatically included in the calculation of the projected total bluff edge retreat for the life of the project.

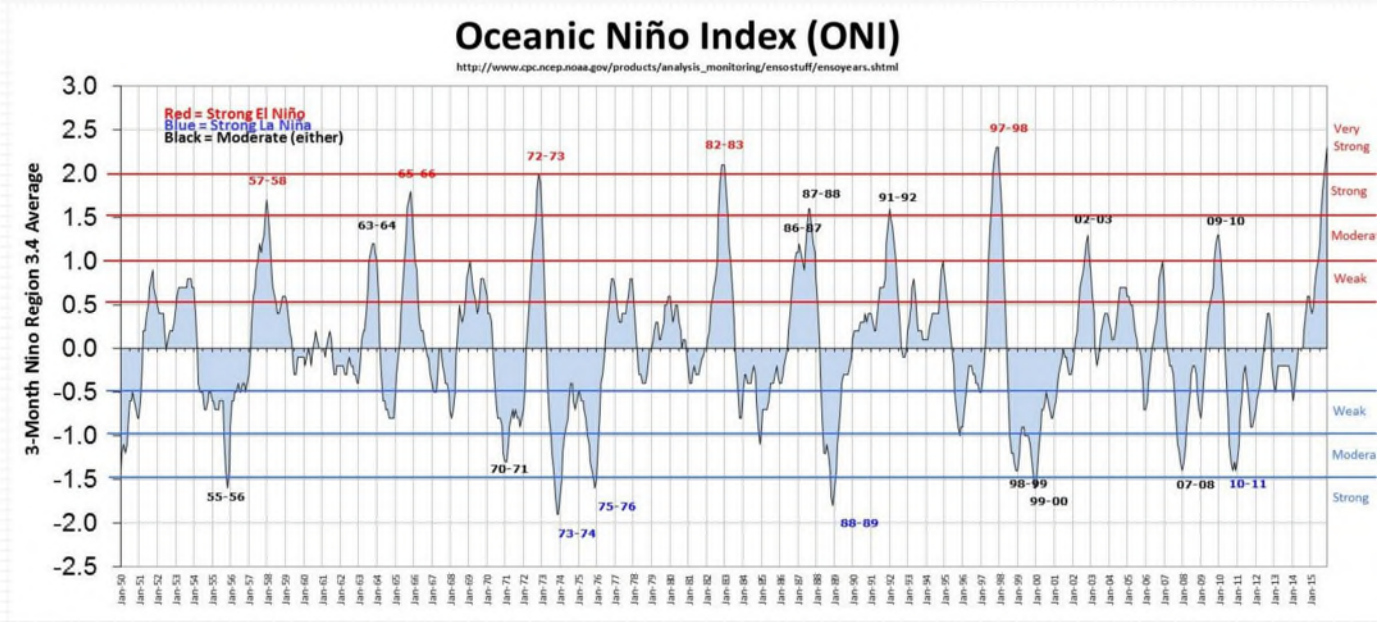

Figure 3. 3-Month Mean Sea Surface Temperature Anomalies, NOAA, updated Feb. 4, 2016 ggweather.com/enso/oni.html

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Young, A.P., and Ashford, S.A., 2007, Quantifying Short-Term Seacliff Morphology of a Developed Coast: San Diego County, California, Dept. of Structural Engineering, Univ. of California, San Diego, La Jolla, California, Rept. No. SSRP-07/01.

Young, A.P., Flick, R.E., O'Reilly, W.C., Chadwick, D.B., Crampton, W.C., and Helly, J.J., 2014, Estimating cliff retreat in southern California considering seal rise using a sand balance approach, Marine Geology 348, 15-26.

Aerial Photographs

1928, San Diego County, Flt 45, D,E, and F
1941, c-6850 100 and 101, Univ. Calif. Santa Barbara Library Aerial Imagery Research Service, Maps and Imagery Lab,
1953, U.S. Dept. Agriculture, AXN 8M, 80 and 81
1978, San Diego County Flt. 17, Frms B40-43, and Flt. 16, Frames 46 and 47

APPENDIX E

APPENDIX E

THIRD PARTY INDEPENDENT REVIEW
PREPARED BY DR. BENJAMIN BENUMOF

FOR

MARISOL
DEL MAR, CALIFORNIA

PROJECT NO. G1710-32-04

GEO-LAW
LAW AS IT RELATES TO THE EARTH

September 6, 2019

VIA E-MAIL

Mr. David B. Evans, CEG
Vice President
GEOCON, Inc.
6960 Flanders Drive
San Diego, CA 92121-2974
Phone: 858.558.6900
Email: evans@geoconinc.com

Re: Third-Party Independent Review and Analysis of Bluff-Top Erosion Rate and Stability Studies Performed by GEOCON, Inc. and Michael Hart, CEG for Zephyr Partners' Del Mar Resort Project

Dear Mr. Evans:

In accordance with your request and the authorization of Zephyr Partners, the developer of the proposed bluff-top resort project southwest of the intersection of Camino Del Mar (Highway 101) and Via De La Valle/Border Avenue in Del Mar, California ("Zephyr Project" site), the undersigned ("Reviewer") is providing this third-party independent evaluation of bluff-top erosion rate and stability studies performed by GEOCON, Inc. and Mr. Michael Hart, CEG for the Zephyr Project.

More specifically, the purpose of this letter is to provide comprehensive review and analysis of historical and future bluff-top erosion studies performed for and in the vicinity of the Zephyr Project site, including key geotechnical evidence demonstrating the mechanisms of coastal bluff erosion and the importance of material properties in controlling the manner and rate of erosion along Del Mar's northernmost coastal bluffs (i.e., the Project site), extending from the popular "Dog Beach" at the rivermouth of the San Dieguito River to the southwesternmost boundary of the City of Solana Beach.

A. Coastal Bluff Geomorphology and Erosion of the Northern Del Mar, California, Shoreline.

The typical coastal-bluff profile along the majority of the northern Del Mar, California, shoreline in the vicinity of the Project site is divided into three zones: (1) the shore platform, (2)

a lower near-vertical cliff surface termed the sea-cliff that is typically comprised of well-lithified sandstone and mudstone units with relatively high intact rock strength, and (3) an upper bluff slope generally ranging in inclination between about 20 and 80 degrees (measured from the horizontal) that is typically comprised of relatively weakly lithified, sandy marine terrace deposits. The bluff-top or bluff edge is the boundary between the upper bluff and the relatively flat lying to gently sloping coastal terrace.

Offshore from the sea-cliff is an area of relatively indefinite extent termed the near-shore zone. The bedrock surface in the near-shore zone, which extends out to sea from the base of the sea-cliff, is the shore platform. As pointed out by Trenhaile (1987) in one of the leading texts on the geomorphology of rocky coastlines, worldwide, the shore platform may vary in inclination from near horizontal to as steep as 3:1 (h:v). In the Del Mar, Solana Beach, and Encinitas areas, the shore platform extends 500 to 900-feet offshore at a 1-to-2 percent grade (United States Army Corps of Engineers [USACE], 2012). The boundary between the sea-cliff (the lower vertical and near-vertical section of the bluff) and the shore platform is called the cliff-platform junction, or sometimes the shoreline angle. Within the near-shore zone, there is a subdivision called the inshore zone, where the waves begin to break. This boundary varies with time because the point at which waves begin to break changes dramatically with changes in wave size, tidal level, and the presence or absence of sand bars, reefs, etc., that trigger the break point of a breaking wave.

During low tides, large waves will begin to break further away from shore. During high tides, waves may not break at all, or they may break directly on the lower cliff. Closer to shore is the foreshore zone, or the portion of the shore lying between the upper limit of wave wash at high tide and the ordinary low water mark. Both of these boundaries often lie on a sand or cobble beach. In the instant matter, a shoreline with a well-defined seacliff and blufftop exceeding 80-feet above mean sea level, the foreshore zone extends from low water to the lower face of the seacliff where the Torrey Sandstone and Del Mar Formations are relatively resistant to erosive forces as compared to the more weakly lithified and (topographically) lower bluffs to the south of the Project site (i.e., approximately 15th Street and trending to the south, where the bluffs are much more susceptible to erosion because intact rock strength is lower and the rocks have less cohesive strength) (see Benumof & Griggs (1999)).[1]

Emery and Kuhn (1982) developed a global system of classification of coastal bluff profiles, and applied that system to the San Diego County coastline from San Onofre State Park to the southerly tip of Point Loma. Emery and Kuhn (1982) designated the majority of the Del Mar, Solana Beach and Encinitas coastline – including the Project site – as "active" and "Type C(c)." The letter "C" designates coastal bluffs having a resistant geologic formation along the base of the bluff and more erodible earth materials in the upper portions of the bluff, which is the designation for the Project site. The relative effectiveness of marine erosion compared to subaerial erosion of the bluff produces a characteristic profile. The letter "(c)" indicates that the long-term rate of marine erosion is approximately equal to that of subaerial erosion;

[1] Benumof & Griggs (1999), "The Dependence of Seacliff Erosion Rates on Cliff Material Properties and Physical Processes: San Diego County, California", Vol. 67, No. 4, pp. 29-41.

geomorphically, erosion tends to occur when the base of the sea-cliff erodes from marine erosive forces, tectonic shaking, or simple gravity failures along discontinuities, and the upper bluff is no longer well-supported from below, causing the upper bluff to collapse as a blockfall or topple. Additionally, the upper bluff, given its lesser cohesive strength, is susceptible to rain driven and anthropogenically induced runoff that is not properly channeled away from the bluff face.

As explained in detail in the GEOCON geotechnical investigation for the Project, the Project site is comprised of Middle Eocene-age Torrey Sandstone overlain by Old Paralic Deposits throughout the majority of the Project site. Where encountered, the Torrey Sandstone consists of "dense to very dense, light brown, silty, fine to medium sandstone with varying degrees of cementation." Importantly, where exposed on the beach along the northern portion of the Project site, the "Torrey Sandstone forms a robust and resistant face along the base of the seacliff." (See GEOCON Investigation Report, page 5.)

Likewise, the Middle Eocene-age Del Mar Formation underlies the Torrey Sandstone throughout the majority of the Project site. The Del Mar Formation consists of "cemented, very dense damp to moist, yellowish brown to grayish green silty, fine to medium sandstone with some interbeds of dark grey siltstone and claystone observed along the bluff face." Notably, in the southern portion of the Project site, "prominent cemented marine fossil beds" occur along the beach; as with the Torrey Sandstone along the beach, the Del Mar Formation "forms a robust and resistant face at the base of the seaward cliff face." (See GEOCON Investigation Report, page 6.)

Furthermore, "the contact and bedding within the Torrey Sandstone and Del Mar Formation is striking generally northwest-southeast and dips between 3 to 14 degrees to the northeast [i.e., landward]." (See GEOCON Investigation Report, Figure 4 "Geologic Structure Map", Figure 5 "Bluff Face Map", and annotated oblique aerial photos attached as Figures 12-16. As a matter of geologic principle, this means that the Project's coastal bluffs are not readily susceptible to dip-slope failures originating from bedding planes dipping out of slope.

In addition, GEOCON Figures 12-16 provide ample evidence demonstrating that the lower bluff area exposing stronger Eocene units with a robust profile has retreated at a slower rate than the Old Paralic deposits of the upper bluff. Indeed, much of the historical erosion appears to have been concentrated in bowl-shaped areas of the upper bluff where uncontrolled runoff or flow of water over the slope, from ordinary rain or runoff, has likely increased average erosion rates of the uppermost crest of the bluff-top compared to other areas where the surface runoff is controlled.

Overall, GEOCON notes that the upper terrace deposits are relatively weakly cemented and "have a higher propensity for shallow exfoliation and brittle planar failures due to shear and tensile stresses, respectively." (See GEOCON Investigation Report, page 8.) With proper development and channeling of water away from the bluff-top, the Project can substantially mitigate the effects of water flow from the Project to the bluff face and therefore help minimize long-term retreat of the Project site. GEOCON Figure 28 ("Subaerial Erosion Map") indicates that the westward flow of meteoric water over the blufftop will be reduced by 87% upon the completion of the proposed development.

B. Summary of Historical Seacliff Erosion Along the Northern Del Mar Shoreline As Published In Benumof & Griggs (1999) and Benumof et al (2000)

By way of background, according to numerous California Coastal Commission staff reports and the professional opinion of Dr. Mark Johnnson, the Commission's former chief geologist, in approving and conditioning recent bluff-top development applications in San Diego County, the current published state-of-the-art study for establishing bluff retreat rates in the area of the Zephyr Project is a FEMA-funded study conducted as part of a nationwide assessment of coastal erosion hazards by Benumof & Griggs (1999). Likewise, Commission Chairperson Bocho and others have recognized that the Benumof & Griggs (1999) study is the "best available scientific resource for establishing bluff retreat rates in this area."

The Benumof & Griggs (1999) investigation, published in part in Shore & Beach, the professional journal of the American Shore and Beach Preservation Association, but covering the vast majority of the San Diego County coastline, from the Mexican International Border to Oceanside Harbor, including the entire Del Mar, Solana Beach and Encinitas coastlines where the bluffs are largely comprised of the relatively resistant Torrey Sandstone and Del Mar Formation, utilized soft-copy photogrammetric and geographic information system (GIS) techniques and historical imagery from the Whittier Fairchild Collection dating back to 1932 to determine high-resolution recession rates by eliminating mapping errors arising from distortion of aerial imagery and ground-control data. This investigation has been unique to the San Diego County coastline in that coastal erosion rates have never been determined so extensively (both temporally and geographically) with high-precision techniques. The landward-most edge of the seacliff (bluff-top) served as the erosion reference feature for calculating erosion rates.

As described in Benumof & Griggs (1999), the effect of material properties on historical seacliff erosion was investigated at eight (8) geologically varied sites along the San Diego County coastline by quantifying the relationship between long-term erosion rates calculated for the FEMA study, varying cliff material properties such as intact rock strength and the geometry of structural discontinuities, and important and unique site erosive processes. This methodology involved quantification of seacliff resistance via: (1) in-situ measurement of intact rock strength, (2) measurement of the orientation, spacing, width, and continuity of structural discontinuities, and (3) generalized evaluation of the significance of groundwater seepage, weathering, and fatigue.

Importantly, the Benumof & Griggs (1999) findings reveal that "the stability of San Diego seacliffs (and probably many other rocky coastlines) is highly dependent on the physical properties of the material (intact rock strength and structure). Statistically significant at the 1.0% level (R^2=0.76), seacliff erosion rates are strongly correlated with intact rock strength. Quantification of cliff structure (joint geometry)…enhances stability analyses to the 0.1% level (R^2=0.81)." Thus, although waves are generally an important mechanism of seacliff or coastal bluff erosion, the Benumof & Griggs (1999) results indicate that marine forces are "secondary to material properties in influencing the rate of cliff retreat."

In addition, in a companion paper published in the Journal of Coastal Research[2], Drs. Benumof and Griggs, in conjunction and collaboration with Dr. Richard Seymour of Scripps Institution of Oceanography (SIO) and Dr. Curt Storlazzi (USGS), investigated the influence of waves on seacliff erosion by comparing the high-resolution erosion rates generated for the FEMA study to wave parameters (height, energy and power or energy flux). This study was specifically aimed at critically evaluating the historical assumption that wave erosion at the base of coastal bluffs is the basic driving factor influencing coastal bluff retreat. Wave parameters for the study were calculated using the California Data Information Program (CDIP) Southern California Refraction-Diffraction Model (SCRDM), an empirical relationship for breaking wave height, and relative power at the cliff toe. Directional wave data from offshore South-Central California were used to initiate the model.

Importantly, what the Benumof et al. (2000) study revealed was that the distribution of wave power in 10 meters of water, at the breakpoint, and at the cliff toe is *inversely* related to historical seacliff erosion rates at each of the Benumof & Griggs (1999) study sites, and that the relationship is shown to be statistically significant at the 1.0% significance level. The authors note, in particular, that while "[w]aves do attack seacliffs, exerting significant hydraulic and mechanical force, and are necessary for removing talus material deposited at the base of sea cliffs by subaerial erosion…our findings suggest that wave parameters along the San Diego coast are secondary to lithology and material strength in explaining the variability of erosion and overall retreat of seacliffs." More specifically, "while the relationship between wave power/energy and seacliff erosion rates may initially seem counter-intuitive, it in fact, supports the predominant theory regarding the evolution of seacliffs. These findings provide quantitative evidence supporting the long-standing concept that resistant rocks form coastal projections or headlands which focus wave energy or power."

To summarize, the findings of the Benumof & Griggs (1999) and Benumof et al. (2000) companion studies reveal that the stability of San Diego County coastal bluffs is variable and highly dependent on the physical properties of the material comprising the seacliffs and long-term erosion rates are mostly strongly correlated with intact rock strength and cliff structure. In a real sense, the collective findings reveal that while waves are a primary control on the *timing* of seacliff erosion, material strength largely determines whether coastal bluffs will be stable, or if they retreat, the *rate* and *manner* of their erosion. This is of *critical importance* in understanding historical rates of retreat in northern Del Mar and evaluating future bluff-top retreat at the Zephyr Project site, which extends from "Dog Beach" at the south end to the southwesternmost boundary of Solana Beach at the north end, the entire stretch of which is characterized by seacliff bedrock that forms a "robust and resistant face at the base of the seaward cliff face." (See GEOCON Investigation Report, page 5.)

In 2011, USGS researchers in conjunction and collaboration with the Department of Civil and Environmental Engineering at UC Berkeley, cited Benumof et al. (2000) as an authority for

[2] Benumof, Storlazzi, Seymour, and Griggs (2000), "The Relationship Between Incident Wave Energy and Seacliff Erosion Rates: San Diego County, California", Journal of Coastal Research, Vol. 16, No. 4, pp. 1162-1178.

the importance of material properties in the stability of steep, cemented sandstone slopes, such as the coastal bluffs that comprise the Project site. The authors, studying how the strength of cemented sands varies depending on the degree to which the sands are cemented, noted in particular that "the ability to form steep outcrops is a testament to cemented sand's intrinsic material strength."[3]

C. The Site-Specific Erosion Rate and Bluff Structure/Morphology Studies Performed By GEOCON and Mr. Michael Hart Are Consistent With and Supported By Benumof & Griggs (1999) and Benumof et al. (2000)

Given that site-specific erosion rate data is the best evidence of how a particular seacliff with a specific lithologic and structural composition will erode in the future[4], at the recommendation of the undersigned per this third-party independent review, GEOCON and Mr. Hart performed photogrammetric and physical surveys to evaluate historical bluff retreat at the Zephyr Project site.

a. GEOCON and Mr. Hart's Initial Coastal Bluff Retreat Investigation

As described in Appendix D to the GEOCON report, Mr. Hart initially performed a Project specific "Bluff Retreat Analysis" in conjunction with GEOCON and Project Design Consultants, calculating historic bluff edge retreat by two methods.

First, Mr. Hart compared and measured the distance between the foundation of a gazebo visible in the central portion of the Zephyr Project site on 1953 aerial photographs and the top of bluff as it currently exists and the bluff edge in 1953.

Second, Mr. Hart measured average bluff recession for the entire 1,500 (+/-) feet length of the bluff from Border Avenue to the southern property limits by photogrammetric methods.

To accomplish this task, Mr. Hart notes that Project Design Consultants (PDC) was provided with two digital aerial tiff images dated 1953. The images were flown with 60% overlap at approximately 15,000 feet altitude. The 1953 images were processed using photogrammetric methods and set up in a modern digital 3D stereo plotter. The 1953 stereo model was scaled and leveled as a means of control by comparing common ground features found in the 1953 flight that still exist today.

After scaling and leveling the model, the images were viewed and compared to the 2016 Del Mar CAD file as a quality control method. Once the 1953 model was determined to be properly set in the stereo plotter the top and toe of the bluff was carefully traced in CAD defining the 1953 bluff line for the exhibit shown on GEOCON Figure 17 (Bluff Retreat Exhibit). Mr.

[3] Collins & Sitar (2011), "Stability of Steep Slopes in Cemented Sands", Journal of Geotechnical and Geoenvironmental Engineering, Vol. 137, No. 1.

[4] See Johnnson (2002) [former Chief Geologist for the California Coastal Commission], "Establishing Development Setbacks From Coastal Bluffs," published in Proceedings, California and the World Ocean Conference, '02, Orville Magoon, ed., 21 p.

Hart reports that, with his supervision, Project Design Consultants were not only able to compare the 1953 bluff line with the bluff line as it existed in 2016, but also the bluff edge as it existed in 1986 as determined from the City of Del Mar Beach Overlay Zone.

Next, Mr. Hart calculated the average rate of bluff retreat from 30 measuring points located at approximately 50-foot intervals along the edge of the bluff. Mr. Hart then scaled the distance from the 1953 and 1986 bluff edges to the current (2016) top of bluff. The average bluff recession rate was then determined by averaging the measurements. These calculations yielded an average rate of bluff recession between 1953 and the present of 0.16 ft./yr. and 0.13 ft./yr. between 1986 and the present.

Importantly, as noted by Mr. Hart, the erosion rate averages determined from photogrammetric methods agree well with an important physical measurement taken on the ground between the bluff top gazebo that was constructed prior to 1953 and the bluff edge utilizing the diameter of the gazebo as a scale. Utilizing the 15 ft. diameter gazebo, Mr. Hart calculated a 10 foot distance (+/- 1') from the bluff edge in 1953 to the western edge of the gazebo, noting that the foundation of the original gazebo still exists on the edge of the bluff as shown in the photograph in GEOCON Appendix D (Hart) and GEOCON Figures 12-16 and Figure 21. Currently, Mr. Hart notes that a portion of the foundation for the gazebo extends two feet over the bluff top. Thus, Mr. Hart reports that these measurements indicate that the bluff edge in the area of the gazebo has retreated 12 feet since 1953 or an average of 0.19 ft./yr., the same distance for this specific location determined by Project Design Consultants by photogrammetric methods.

In addition, at the request of the City of Del Mar planning staff and the City's third-party reviewing consultant, GEOCON calculated site-specific bluff erosion based on the 20-foot and 30-foot elevation contours from 1953 and 2016 (see Figure 22). The 30-foot elevation contour roughly coincides with the contact between Terrace materials and Eocene deposits below and the 20-foot contour is within the Eocene Deposits. GEOCON notes that the combination of blufftop, 20-foot contour, and 30-foot contour provides a representative range of bluff face and blufftop positions for comparison. The calculated erosion rate for these contour intervals is 0.18 ft./yr. and 0.17 ft./yr., respectively. (See GEOCON Investigation Report, page 13 and Figure 22.)

For the initial determination of future bluff retreat and the mitigation of potential but unknown sea level rise, GEOCON and Mr. Hart initially suggested a conservative erosion rate determined from the gazebo to bluff edge (0.19 ft/yr) that is slightly higher than the average rate of 0.16 ft./yr. determined by photogrammetric methods for the entire 1,500 feet long section of the bluff.

b. <u>GEOCON and Mr. Hart's Expanded Coastal Bluff Retreat Investigation</u>

Following the initial photogrammetric work noted above and after meeting with the City of Del Mar's planning staff and third-party reviewing consultant, GEOCON and Mr. Hart initiated and performed a more detailed erosion history investigation, expanding the operative data set by obtaining additional aerial imagery dating back to 1932 and geo-referencing the entire

data set to present day orthophotographs to obtain as much erosion history information as possible and present the data as accurately as modern science allows.

As a means of expanding the time frame of GEOCON's historic erosion rate study, an aerial flight of the property was commissioned in February 2019, to produce an orthophotograph of the site with an accuracy of 6 inches. GEOCON also obtained stereo-pairs of 1932 aerial photographs to expand its study range to 87 years. (See GEOCON Investigation Report, pages 13-14). A photogrammetrist was then retained to geo-reference the historic aerial photos from 1932 (Figure 23) and 1953 (Figure 23), with the 2019 (Figure 24) orthophotograph and measure the difference in bluff top positions at 20-foot intervals along the blufftop. The only exception in GEOCON's comparison occurred in the extreme northern portion of the site where GEOCON did not measure the erosion rate between 1932 and 1953 because of extensive grading at the top of the bluff prior to 1953 that created a road and path to the beach and a flat graded pad at the top of the bluff just south of the northern Project property line.

The geo-referencing process utilized by GEOCON aligned points in common (typically man-made features) between the orthophoto and the historic aerial photographs. The final product produced by GEOCON is a slightly "reshaped" aerial photograph such that the geo-referencing eliminates distortion and has a scale that allows an accurate overlay with the 2019 orthophoto; with the completed orthophotograph, GEOCON was then able to accurately compare and measure the difference in bluff edge location on both photographs. The accuracy of the bluff edge determination for GEOCON's orthophoto is 6 inches (see GEOCON Investigation Report, page 13), which is about as accurate as reasonably possible. The accuracy of the bluff edge location on the 1953 aerial photography is estimated to be +/- 3 feet. As noted by GEOCON, this is based primarily on the high degree of accuracy of the geo-referencing procedure and the excellent quality of the aerial photographs. (See GEOCON Investigation Report, page 13.)

GEOCON's interpretation of the bluff top positions for 1932, 1953, and 2019 are presented on Figure 25. The calculated average retreat rates and the location of measurements of bluff recession recorded at 20-foot intervals along the length of the bluff top are also shown. These positions are based on stereo pair analysis and georeferenced aerial photography. The 2016 top of bluff line originally used in GEOCON's study was determined from the project topographic map. For the position of the modern bluff edge, GEOCON utilized an orthophotograph flown in February 2019, specifically to allow more accurate geo-referencing of the 1932 and 1953 historic aerial photos. (See GEOCON Investigation Report, page 13.)

As reported in GEOCON's Investigation Report, the average bluff recession rate from 1932 to 2019 utilizing the geo-referenced aerial photos is **0.17 ft./yr.** (+/- 0.04 ft./yr.). In GEOCON's opinion the use of this rate represents a conservative estimate of the historic rate of bluff recession for the Project site because it is the longest time-period studied and therefore best takes into account the temporal variability in coastal bluff erosion. GEOCON is correct in this regard.

c. GEOCON and Mr. Hart's Site-Specific Erosion Rate Studies Are Consistent With and Supported By Benumof & Griggs (1999) and Benumof et al (2000)

In the nearby vicinity of the Zephyr Project site, Benumof & Griggs (1999) presents alongshore erosion rate data (see Table 1 and Figure 3a of that study) that supports the findings of GEOCON and Mr. Hart. More specifically, Benumof & Griggs (1999) and data from the aforementioned FEMA erosion rate study documents that the long-term historical average erosion rate from 1932-1994 for the great majority of the Encinitas coastline is 6-7 cm/yr (0.19-0.26 ft/yr), where the coastal bluffs are largely comprised of Torrey Sandstone bedrock overlain by terrace deposits with various degrees of cementation.

What's more, in a relevant matter recently before the California Coastal Commission and now pending before the Court of Appeal after a trial court decision in favor of the applicant property owner, this Reviewer recently performed a third-party independent review for a residential bluff-top project at 444 Neptune Avenue in Encinitas (the "Martin" project) where the project geologists conducted a site-specific erosion rate study (1932-present) using the same historical aerial photography used in the Benumof & Griggs (1999) and FEMA studies to support the project's design with site-specific erosion rate data. Of noted significance, the site-specific study for 444 Neptune conducted by the project geologists revealed that the average long-term erosion rate was 0.13 ft/yr where the upper bluff is comprised locally of a relatively well-cemented iron-oxide cap and the lower seacliff is comprised of massive Torrey Sandstone bedrock that, under the Benumof & Griggs (1999) and Benumof et al. (2000) methodology, explains why 444 Neptune has eroded at a slightly lower average erosion rate than nearby areas with slightly different upper bluff lithology, particularly with respect to the degree of cementation that tends to significantly influence bluff-face morphology (i.e., cross-section profile of the bluff); in general, this much can be said as true – the more cementation in the bluff materials, the more vertical the upper bluff profile exhibits, and the greater tendency for the upper bluff to resist subaerial erosion from rainfall, drainage, and overflow.

These findings are of *great importance* when evaluating historical and future coastal bluff retreat at the Zephyr Project site because of Zephyr's relatively unique lithologic composition and geologic characteristics that directly influence the manner and rate of coastal bluff erosion.

As noted in the GEOCON investigation for the Zephyr Project, the Middle Eocene-age Torrey Sandstone was observed underlying Old Paralic Deposits throughout the majority of the Project site. Where encountered, the Torrey Sandstone consists of "dense to very dense, light brown, silty, fine to medium sandstone with varying degrees of cementation." GEOCON reports that, where exposed on the beach along the northern portion of the Project site, the "Torrey Sandstone forms a robust and resistant face along the base of the seacliff." (See GEOCON Investigation Report, page 5.)

Likewise, GEOCON reports that Middle Eocene-age Del Mar Formation underlies the Torrey Sandstone throughout the majority of Project site. The Del Mar Formation consists of "cemented, very dense damp to moist, yellowish brown to grayish green silty, fine to medium sandstone with some interbeds of dark grey siltstone and claystone observed along the bluff

face." Notably, in the southern portion of the Project site, "prominent cemented marine fossil beds" occur along the beach; as with the Torrey Sandstone along the beach, GEOCON notes that the Del Mar Formation "forms a robust and resistant face at the base of the seaward cliff face." (See GEOCON Investigation Report, page 5.)

Furthermore, GEOCON's measurements indicate that "the contact and bedding within the Torrey Sandstone and Del Mar Formation is striking generally northwest-southeast and dips between 3 to 14 degrees to the northeast [i.e., landward]." (See GEOCON Figure 4 "Geologic Structure Map", Figure 5 "Bluff Face Map", and annotated oblique aerial photos attached as Figures 12-16).[5] Again, as a matter of geologic principle, this means that the Project's coastal bluffs are not readily susceptible to dip-slope failures originating from bedding planes dipping out of slope.

In addition, GEOCON Figures 12-16 provide ample evidence demonstrating that the lower bluff area exposing stronger Eocene units with a robust profile has retreated at a slower rate than the Old Paralic deposits of the upper bluff. Indeed, much of the historical erosion appears to have been concentrated in bowl-shaped areas of the upper bluff where uncontrolled runoff or flow of water over the slope, from ordinary rain or runoff, has likely increased average erosion rates of the uppermost crest of the bluff-top compared to other areas where the surface runoff is controlled.

Overall, GEOCON notes that the upper terrace deposits are relatively weakly cemented and "have a higher propensity for shallow exfoliation and brittle planar failures due to shear and tensile stresses, respectively." (See GEOCON Investigation Report, page 8.) With proper development and channeling of water away from the bluff-top, the Project can substantially mitigate the effects of water flow from the Project to the bluff face and therefore help minimize long-term retreat of the Project site.

In summary, GEOCON and Mr. Hart have documented direct and compelling evidence/observations explaining why the entirety of the Project site has eroded at an average long-term rate of **0.17 ft./yr.** as determined by their site-specific erosion rate studies for the Project's ~1500 feet of coastal bluffs.

In the opinion of the Reviewer, the findings and recommendations of GEOCON and Mr. Hart are in accordance with the findings of Benumof & Griggs (1999) and Benumof et al. (2000), "time-tested" companion studies published in peer-reviewed journals that document that material strength largely determines whether coastal bluffs will be stable, or if they retreat, the rate and manner of their erosion. GEOCON's proposed setback for development for the Project as delineated in GEOCON Figure 3 is therefore supported by site-specific data/observations and is consistent with published literature and the City of Del Mar's erosion setback standards.

[5] As part of this third-party independent review and analysis, this Reviewer accompanied Mr. Evans of GEOCON and Mr. Hart during their reconnaissance field work to observe the geologic and structural conditions and characteristics of the Project's bluff face used to compile GEOCON Figures 4 and 5.

D. Long-Term (Geologic) and Historic Sea Level Change In San Diego County.

The discussion above summarizes the coastal geomorphology and erosion history of the Project site; a coastline defined by tall, rocky, robust sea-cliffs comprised of well-lithified sandstone and mudstone that has proven to be relatively resistant to erosion over human (decadal) time scales, with properly located shoreline development prevalent in San Diego County for many decades now.

Over long-term (geologic) time scales, however, sea level change is a major factor determining coastal evolution, or in other words, the landward or seaward migration of the coastline (Emery and Aubrey, 1991). This is because sea level has fluctuated many tens of feet over many millions of years depending on whether global climate is relatively "cold" (i.e., during ice ages, where sea level drops dramatically and the coastline extends miles seaward of its present location) or relatively "hot" periods (i.e., our current global environment) where sea level is at or about its known or postulated higher levels.

Three general sea level conditions are recognized in the scientific literature: (1) rising, (2) falling, and (3) stationary. The rising and falling stages result in massive sediment release and transport given that coastal streams and rivers are able to meander further seaward and deposit material on the coastal plain, while the "stationary" stage allows time for adjustment and reorganization toward a so-called natural "equilibrium".[6]

It is widely accepted that major changes in sea level of the Quaternary period were caused by worldwide climate fluctuation resulting in at least seventeen (17) glacial and interglacial stages in the last 800,000 years and many before then (see Shakelton and Opdyke, 1976). Worldwide, sea level rise associated with the melting of glaciers is commonly referred to as "glacio-eustatic" or "true" sea level rise. During the past 200,000 years, eustatic sea level has ranged from more than ±350-feet below the present sea level to possibly as high as about ±31-feet above present sea level.

Tectonic activity (i.e., the shifting of land masses along fault lines) can also account for significant relative changes in sea level in a local area. For example, past movement along the Rose Canyon fault zone and associated faults, which served to uplift Mount Soledad and formed Point La Jolla due to convergence along a bend in the right-lateral fault zone (Benumof & Griggs (1999)), also created a zone of structural weakness along which the La Jolla Submarine Canyon has been incised. The Torrey Pines block, with its relatively horizontally stratified Eocene-age formations and wave-cut terraces, has experienced more than 450-feet of tectonic uplift in the

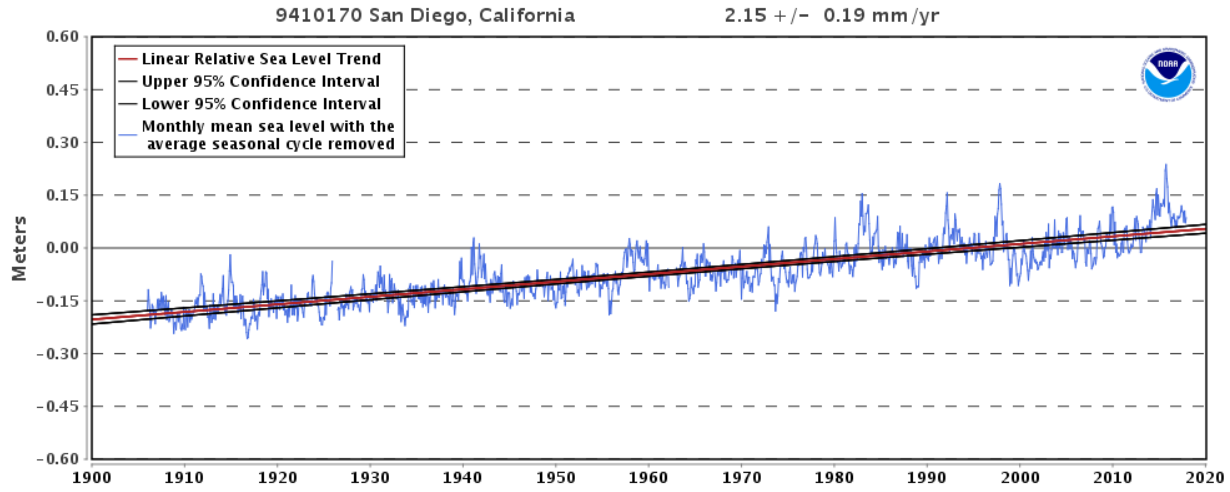
[6] The "stationary" condition is largely the construct of overly academic definitions for the sake of labeling the obvious, ever-changing cycle of coastal, physical processes. In reality, the "stationary" condition is but a "moment" that may exist in classical mathematical theory applied to coastal processes on an hourly, or lesser, time scale, but when the so-called "equilibrium" does occur, it must, in reality, only be for a fleeting moment (at any particular fleeting moment) given the constant push-pull nature of Mother Nature and the wildly dynamic forces that exist in the coastal, near-shore environment over short-term time scales.

last 2 million years, while the tilted and uplifted Soledad Mountain block has undergone more than 750-feet of tectonic uplift in the same period (Kern, 1977).

Sea level changes during the last 18,000 years have resulted in an approximately 400-foot rise in sea level when relatively cold global climates of the Wisconsin ice age started to become warmer; melting a substantial portion of the continental ice caps (Curray, 1960 and 1961). Sea level data show a relatively rapid rise of about one (1) meter per century from about 18,000 years before present to about 8,000 years ago, as indicated in Masters & Fleming (1983). About 8,000 years ago, the rate of sea level rise slowed, ultimately to a relatively constant rate of about 10-centimeters per century since about 6,000 years ago (Curray, 1960,1965; Inman & Veeh, 1966). More importantly, the world coastline, including that of California and the subject Project site, has been shaped largely within this 6,000-year period, with the sea at or within 16-feet of its present level (Bird, 1985).

E. <u>Published Literature/Authoritive Guidelines Regarding Future Sea Level Rise Along The Western United States, and the San Diego County Shoreline, In Particular, Indicates That Sea Level Rise – Even As Much as 7-Feet Over The Next 100 Years – Will Not Adversely Affect The Project Over Its Economic Lifetime.</u>

As demonstrated by the long-term historical record that has been acutely captured at Scripps Institution of Oceanography since the turn of the 20th Century, the fact of the matter is sea level in San Diego County has been rising *linearly* at the mean rate of 2.15 mm/yr (+/- 0.19 mm/yr) since 1906 as monitored by monthly mean sea level data.[7]



Although various future sea level scenarios have been projected and publicized in areas where sea level rise is projected across low-lying beach profiles absent of rocky coastal sea-cliffs – for example, the low-lying "Dog Beach" at the rivermouth of the San Dieguito River (where the coastal cliffs of the Project cease to occur and the beach profile is controlled by wave and tidal influences) – the quantitative impact of rising sea level and its effect on the rate of erosion

[7] See https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?stnid=9410170

of dense, rocky coastal cliffs such as those comprising the Project site, where the Torrey Sandstone and Del Mar Formation are the dominant cemented materials resisting wave attack, as opposed to unconsolidated beaches, dunes or weakly lithified terrace deposits that are much more susceptible to wave attack, is subject to numerous assumptions and speculation as to cliff erodibility as reported in the published literature addressing cliff retreat considering sea level rise.[8]

There is currently a wide range of predicted rates in sea level rise over the next century for the west coast of the United States, from a few inches to over 7-feet. This wide range makes it extremely difficult for the design of coastal development, particularly in low-lying areas that are susceptible to tidal flooding and wave run-up.

In considering the potential future effect or impact of sea level rise on future erosion of the Project's bluffs, GEOCON initially applied a 1.5 factor of safety multiplier to the historic erosion rate calculation to account for the unknown effects or impacts of sea level rise on the future rate of erosion. This procedure has been suggested as the standard of practice in the California since Dr. Johnnson issued his Coastal Commission guideline Memorandum W11.5. in 2003. Thereafter, it was subsequently was revealed by City Staff and the City's third-party reviewing consultant that, while the Coastal Commission has accepted a "multiplier" approach in the past, this method is not endorsed or recommended in the newly developed sea level rise guidance literature when other, science-based approaches are available. As a consequence, several other sea level rise models were considered by GEOCON.

Given the regional nature and the admittedly low accuracy of the erosion rates identified in several of the newly published sea level rise models such as COSMOS developed by researchers at the USGS, as well as the fact that these models are admittedly not intended to be used for site-specific analyses as disclaimed by the COSMOS authors, the selected model used by GEOCON to calculate the effects of sea level rise on the future rate of bluff retreat at the Project site is the "Simple Equation" method, which is more appropriate for relatively erodible soft cliff shorelines as disclosed in the literature (unlike the hard rock seacliffs of the Zephyr Project site).

The Simple Equation analyzed by GEOCON is expressed as: **R2 = R1 (S2 / S1)1/2**, where R2 is future rate of bluff retreat, R1 is historical bluff retreat rate, and S2/S1 is the ratio of future (anticipated) sea level rise rate to historical sea level rise rate. The use of the simple equation has been recognized as a *conservative estimate of future bluff retreat* by the CCC (per GEOCON team member communication with CCC) in the San Diego area. As noted, the equation is intended for evaluation of *soft cliff* retreat which is a conservative assumption considering the lithified nature of the onsite lower bluffs of the Zephyr Project site.

[8] See A.P. Young et al (2014), "Estimating Cliff Retreat in Southern California Considering Sea Level Rise Using A Sand Balance Approach", Marine Geology (2014) 15-26; and M. J. Bray and J.M. Hooke (1997), "Prediction of Soft Cliff Retreat With Accelerating Sea Level Rise", Journal of Coastal Research, Vol. 13, No. 2, pp. 453-467 [concluding that "[c]hanges on cliffed coasts are not easily predicted because recession is the cumulative result of numerous interacting variables].

For evaluation of historical sea level rise, GEOCON utilized the 1932 to 2019 time-period because it provides a conservative erosion estimate using site-specific data for a multi-decadal analysis. In addition, GEOCON utilized historical sea level data from Scripps Pier in La Jolla to establish sea level rise for the same period. Detailed calculations for the Simple Equation are provided on GEOCON's Figure 26. The sea level data from Scripps Pier in La Jolla is presented in Appendix G. As noted by GEOCON, Figure 26 presents projected future bluff positions and associated Simple Equation calculations.

As recommended by the CCC's Sea Level Rise Policy Guidance (2018 update), GEOCON analyzed bluff retreat based on three scenarios: (1) the low risk aversion scenario with a 17 percent probability of exceedance (also referred to as OPC's 66% probability scenario) under a high emission scenario; (2) the medium-high risk aversion scenario with a 0.5 percent probability of exceedance for projected sea level rise per the Ocean Protection Council (OPC) 2018 under a high emission scenario; and (3) the extreme risk aversion H++ scenario.

According the CCC's new guidelines, the 0.5 percent probability of exceedance scenario setback is recommended for all primary structures associated with the project. As such, GEOCON and Zephyr's planning team have designed all primary structures to the medium-high risk aversion scenario's bluff setback range. GEOCON reasonably concludes that since the likelihood that sea-level rise will meet or exceed this value is low, planning for this scenario provides a precautionary approach, as recommended by both OPC and CCC's sea level rise guidance documents. Indeed, a precautionary approach should be used when project components are less adaptive and more vulnerable, such as the proposed resort housing. By using the medium-high risk aversion scenario to calculate the blufftop setback range, GEOCON notes that these principal structures will be built to assure structural stability for 75 years without the reliance of new bluff or shoreline protection measures. (See GEOCON Investigation Report, page 15). The blufftop setback range for medium-high risk aversion structures can be seen in GEOCON's Table 6.3 and Figures 26 and 27.

As reported in GEOCON's investigation, the future rate of bluff retreat assuming the Simple Equation with a 0.5 percent probability of exceedance sea level rise under a high emission scenario (medium-high risk aversion), equates to **33 total feet of retreat in a 75-year span**. (See GEOCON Investigation Report, Table 6.3). Then, adding this distance to the 1.5 factor of safety setback line for slope stability results in a total setback from the top of the bluff ranging from **43 to 95 feet** which is the recommended setback criteria for primary structures (structures that are less adaptive, e.g. resort buildings).

In addition, the proposed development includes public access trails, pools, hardscape, landscaping, benches, and other types of soft adaptive development. In order for the Project's new trails to connect with existing trails and coastal access paths currently located in the North Bluff Preserve area, new trails will be located seaward of the blufftop setback range calculated for medium-high risk aversion development types (F.S.1.5 + 33 feet).

As noted by GEOCON, the adaptive capacity of the soft development components of the Project are fairly high, and if necessary, can be easily removed and/or moved back. Following

the recommendations set forth in both the OPC and CCC sea level rise guidance documents, these are fairly risk tolerant and low consequence types of development can be located in front of the medium-high blufftop setback. Indeed, the Project has adequate space for the trails to be moved back if necessary, ensuring that no public access will be lost in light of future sea level rise.

GEOCON Figures 3 and 26 presents the recommended blufftop setback delineations considering the Simple Equation model with medium-high risk aversion scenarios to account for sea level rise. Figure 27 presents the 0.5 percent probability of exceedance sea level rise under a high emission scenario (medium-high risk aversion, F.S.1.5 + 33 feet) plotted on a resort rendering.

Importantly, due to the relatively high elevation of the proposed development (mostly above 80-feet NAD83 at the majority of cross-sections analyzed by GEOCON), the Project is reasonably considered by GEOCON to be reasonably safe from coastal hazards including shoreline erosion, wave attack, wave overtopping and coastal flooding, even with a conservative sea level rise of 7-feet over the life of the Project.

The illustrations and photographs on the following pages (see, e.g., "Sea Level Rise Exhibit Geologic Cross-Section T-T'") are useful for showing how even a conservative-minded 7-foot rise in sea level over the next 100 years would appear to have nominal geotechnical or impact on the massive bluffs comprised of the Torrey Sandstone and Del Mar Formations, and there is no compelling evidence indicating that the incremental sea level rise would be such a strong driving force that erosion of the Project would accelerate in any way because the mechanisms and manner of erosion would remain the same (see discussion above regarding Project site geomorphology). In short, the scientific literature suggests that even a 7-foot rise in sea level over the life of the Project will simply shift the beach profile upwards and landwards, but only landward if appreciable erosion occurs at the toe of the sea-cliff. Otherwise, the beach profile will simply adjust upwards, particularly given that the Encinitas, Solana Beach and Del Mar areas are approved to be regularly nourished via a 50-year federal beach nourishment project aimed at increasing beach with by 50-feet in Encinitas and Solana Beach.[9] In addition, it is this Reviewer's understanding that the Zephyr Project will also provide for regular beach nourishment funded by taxes collected from guests that stay and utilize the proposed resort.

Indeed, it is widely accepted that for any given stretch of beach, a wider beach fronting adjacent coastal bluffs will provide those bluffs more protection from wave attack than will a narrower beach. In other words, the wider the beach, the less of a chance for wave run-up, and the more protection afforded to the base of the seacliff.

Thus, whereas structural means of beach retention were common 30 to 50 years ago, beach nourishment has become the preferred method in recent decades because beach nourishment represents a "soft" method of shoreline stabilization, in contrast to "hard"

[9] See http://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Solana-Encinitas-Shoreline-Study

alternatives such as groins. Soft stabilization alternatives, such as sand or cobble beach fills, mimic nature and are intended to be dynamic, responding to changes in wave and current conditions.

Introducing new sand onto the beach can compensate for a reduced sediment supply delivered by rivers and streams. In this way, beach nourishment represents a means of restoring a more natural system. Wider beaches, in turn, reduce the need for hard structures by providing the base of coastal bluffs with protection from wave attack while simultaneously increasing recreational opportunities.

With respect to the proposed Zephyr Project and any postulated erosive *impact* of future sea level rise within the Project's lifetime, it is important for all interested parties to recognize any that any meaningful import of beach sand to the Project site or areas immediately updrift of the littoral movement of sand (generally, north to south) will provide the Zephyr Project site with significant added protection from wave attack at the base of the seacliff due to the presence of a wider beach,

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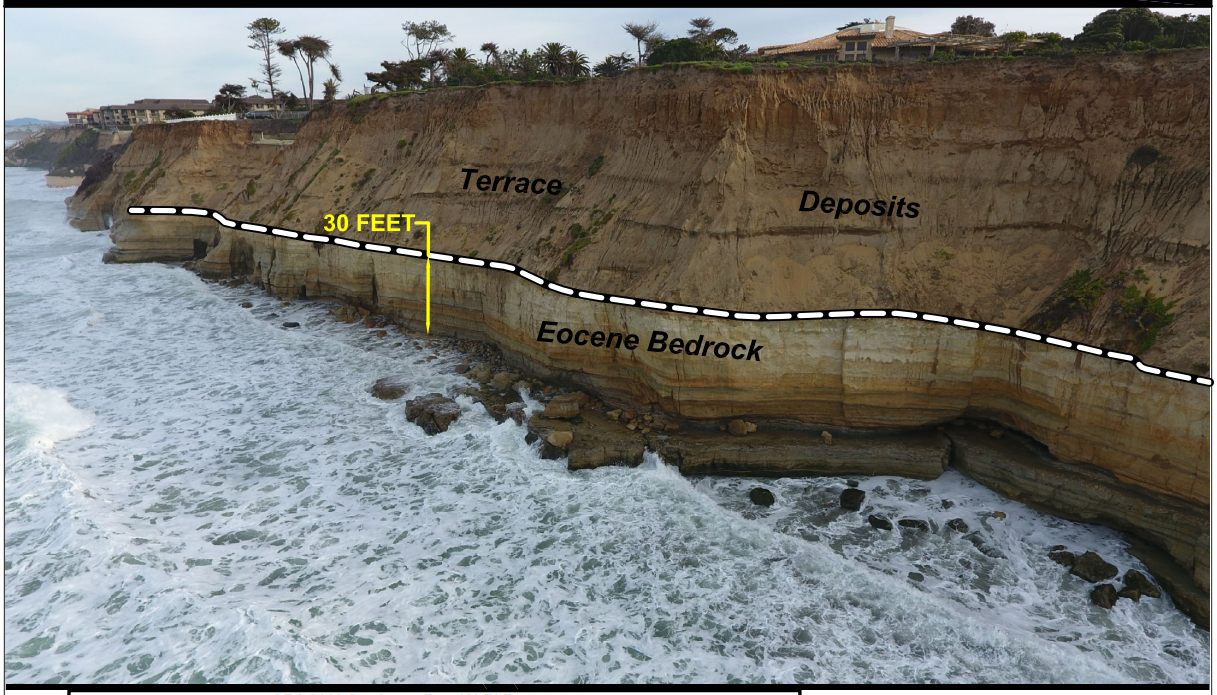
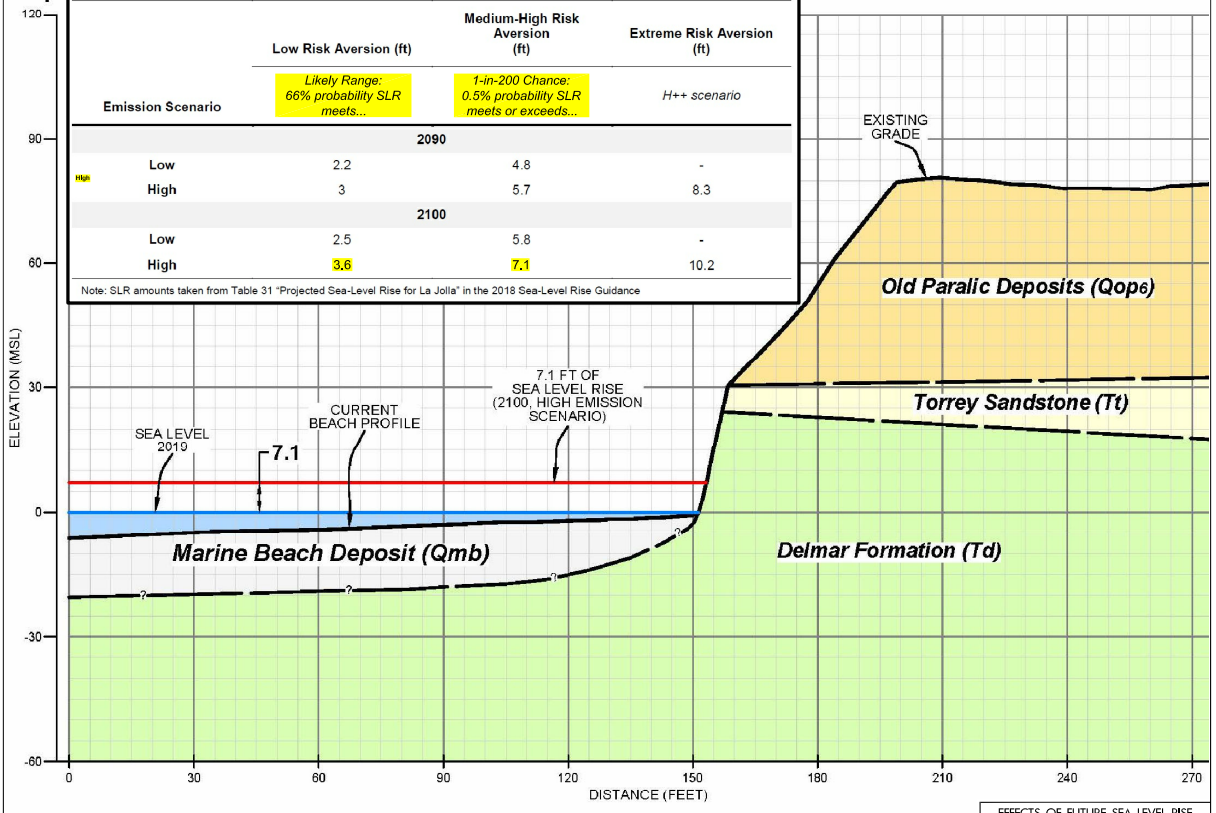
EFFECTS OF FUTURE SEA LEVEL RISE AT DEL MAR NORTH BEACH



OPC 2018 Sea Level Rise (SLR) Projections

Emission Scenario	Low Risk Aversion (ft)	Medium-High Risk Aversion (ft)	Extreme Risk Aversion (ft)
	Likely Range: 66% probability SLR meets...	*1-in-200 Chance: 0.5% probability SLR meets or exceeds...*	*H++ scenario*
2090			
Low	2.2	4.8	-
High	3	5.7	8.3
2100			
Low	2.5	5.8	-
High	3.6	7.1	10.2

Note: SLR amounts taken from Table 31 "Projected Sea-Level Rise for La Jolla" in the 2018 Sea-Level Rise Guidance



GEOLOGIC CROSS-SECTION T-T'

SCALE: 1" = 30' (Vert. = Horiz.)

EFFECTS OF FUTURE SEA LEVEL RISE
MARISOL
DEL MAR, CALIFORNIA
GEOCON INCORPORATED
SCALE: 1" = NTS
DATE: 09 - 06 - 2019
PROJECT NO. G1710 - 32 - 04
SHEET 1 OF 1

Figure 1. View looking north showing the dense, intact rock of the lower sea-cliff and upper bluff terrace deposits, with bedding planes dipping landward.

Figure 2. View looking south also showing the dense, intact rock of the lower sea-cliff and upper bluff terrace deposits, with bedding planes dipping landward.

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Limitations

This third-party independent review has been performed at the request of GEOCON, Inc. and with the authorization of Zephyr Partners. The role of the Reviewer has been to provide technical advice to assist GEOCON and Zephyr Partners in their development and processing of the Project, and the Reviewer is afforded all reasonable protections under California state law in relying on information provided to the Reviewer and in opining on matters related to the review of the Project. The Reviewer's services have been limited to the review of the documents noted and site reconnaissance of the Project site and the length of the coastal bluff face involved in the Zephyr Project. The Reviewer has no control over future construction on the Zephyr Project property and makes no representations or warranties regarding future conditions affecting the Zephyr Project.

The Reviewer has employed accepted coastal geology and geotechnical procedures, and the Reviewer's opinions and conclusions are made in accordance with generally accepted coastal geologic and geotechnical engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

If you have any questions or would like to discuss the foregoing, please feel free to call or e-mail.

Sincerely,

Benjamin T. Benumof. Ph.D., Esq.
GEO-LAW, P.C.

cc: Jim McMenamin, Zephyr Partners

APPENDIX F

APPENDIX F

CALCULATIONS

FOR

MARISOL
DEL MAR, CALIFORNIA

PROJECT NO. G1710-32-04

Station Name : La Jolla (Scripps Pier) California
Country: U.S.A.
GLOSS Number: 159
PSMSL Code: 256
Latitude: 32.86666
Longitude: -117.26666

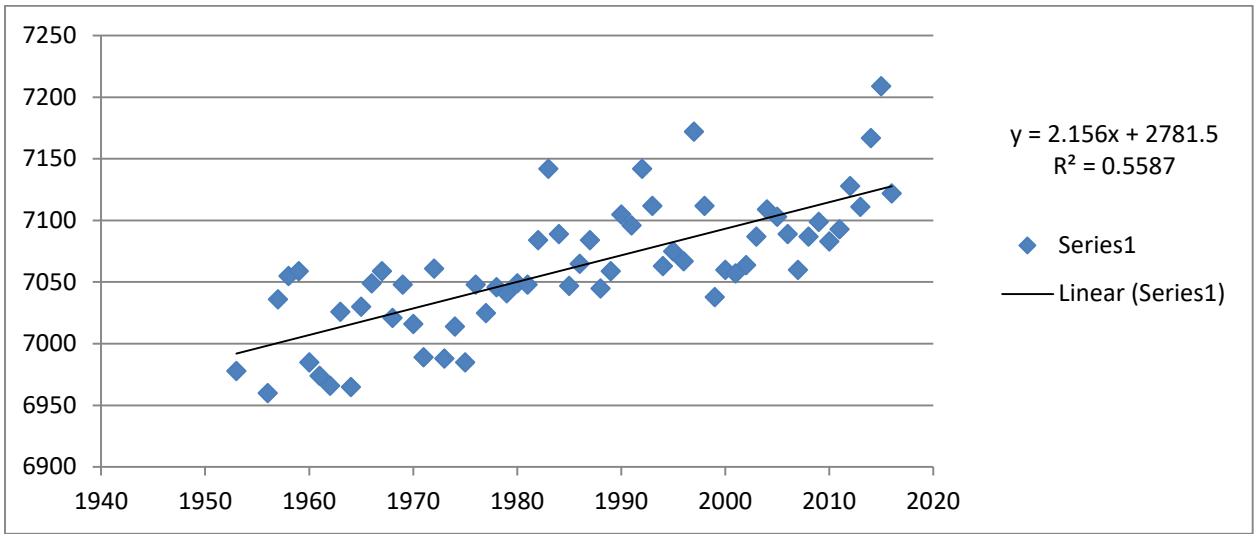
Year	Mean Sea Level (mm)	Missing Days	Attention
1925	6938	N	0
1926	6964	N	0
1927	6937	N	0
1928	6956	N	0
1929	6967	N	0
1930	6973	N	0
1931	6975	N	0
1932	6955	N	0
1933	6907	N	0
1934	6935	N	0
1935	6933	N	0
1936	6951	N	0
1937	6961	N	0
1938	6947	N	0
1939	6979	N	0
1940	6987	N	0
1941	7024	N	0
1942	6974	N	0
1943	6969	N	0
1944	6968	N	0
1945	6972	N	0
1946	6982	N	0
1950	6957	N	0
1951	7003	N	0
1952	6991	N	0
1953	6978	N	0
1956	6960	N	0
1957	7036	N	0
1958	7055	N	0
1959	7059	N	0
1960	6985	N	0
1961	6974	N	0
1962	6966	N	0
1963	7026	N	0
1964	6965	N	0

Station Name : La Jolla (Scripps Pier) California
Country: U.S.A.
GLOSS Number: 159
PSMSL Code: 256
Latitude: 32.86666
Longitude: -117.26666

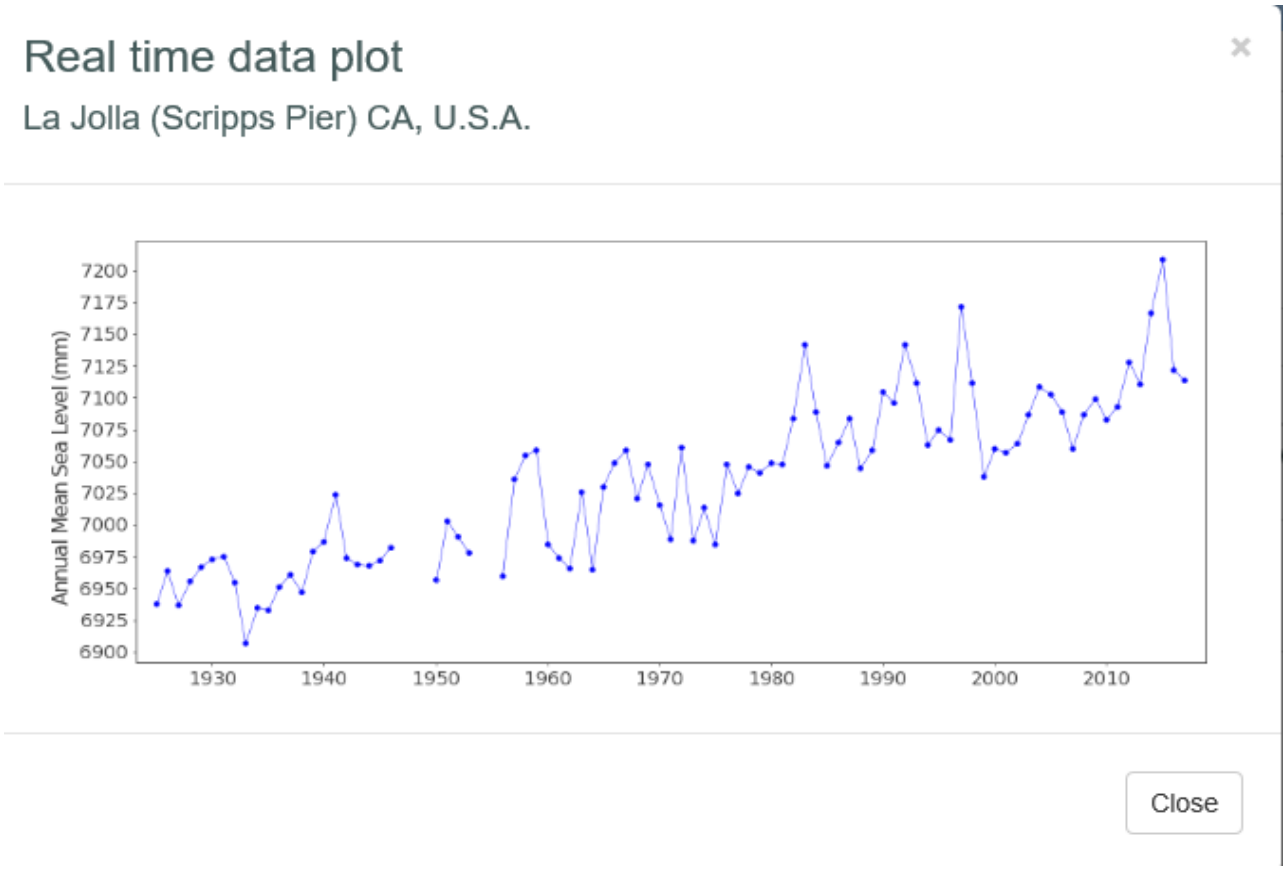
Year	Mean Sea Level (mm)	Missing Days	Attention
1965	7030	N	0
1966	7049	Y	0
1967	7059	N	0
1968	7021	N	0
1969	7048	N	0
1970	7016	N	0
1971	6989	N	0
1972	7061	N	0
1973	6988	N	0
1974	7014	N	0
1975	6985	N	0
1976	7048	N	0
1977	7025	N	0
1978	7046	N	0
1979	7041	N	0
1980	7049	N	0
1981	7048	N	0
1982	7084	N	0
1983	7142	N	0
1984	7089	N	0
1985	7047	N	0
1986	7065	N	0
1987	7084	N	0
1988	7045	N	0
1989	7059	N	0
1990	7105	N	0
1991	7096	N	0
1992	7142	N	0
1993	7112	N	0
1994	7063	N	0
1995	7075	N	0
1996	7067	N	0
1997	7172	N	0
1998	7112	N	0
1999	7038	N	0
2000	7060	N	0

Station Name : La Jolla (Scripps Pier) California
Country: U.S.A.
GLOSS Number: 159
PSMSL Code: 256
Latitude: 32.86666
Longitude: -117.26666

Year	Mean Sea Level (mm)	Missing Days	Attention
2001	7057	N	0
2002	7064	N	0
2003	7087	N	0
2004	7109	N	0
2005	7103	N	0
2006	7089	N	0
2007	7060	N	0
2008	7087	N	0
2009	7099	N	0
2010	7083	Y	0
2011	7093	N	0
2012	7128	N	0
2013	7111	N	0
2014	7167	N	0
2015	7209	N	0
2016	7122	N	0
2017	7114	N	0



2.156 mm per year calculated sea level rise (1953 to 2016)



NOAA gloss-station handbook data Scripps Pier, La Jolla

Table G-11. Sea Level Rise Projections for the La Jolla Tide Gauge[116] (OPC 2018)

Projected Sea Level Rise (in feet): *La Jolla*			
	Probabilistic Projections (in feet) (based on Kopp et al. 2014)		H++ Scenario (Sweet et al. 2017)
	Low Risk Aversion	**Medium-High Risk Aversion**	**Extreme Risk Aversion**
	Upper limit of "likely range" (~17% probability SLR exceeds...)	*1-in-200 chance (0.5% probability SLR exceeds...)*	*Single scenario (no associated probability)*
2030	0.6	0.9	1.1
2040	0.9	1.3	1.8
2050	1.2	2.0	2.8
2060	1.6	2.7	3.9
2070	2.0	3.6	5.2
2080	2.5	4.6	6.7
2090	3.0	5.7	8.3
2100	3.6	7.1	10.2
2110*	3.7	7.5	12.0
2120	4.3	8.8	14.3
2130	4.9	10.2	16.6
2140	5.4	11.7	19.2
2150	6.1	13.3	22.0

**Most of the available climate model experiments do not extend beyond 2100. The resulting reduction in model availability causes a small dip in projections between 2100 and 2110, as well as a shift in uncertainty estimates (see Kopp et al., 2014). Use of 2110 projections should be done with caution and acknowledgement of increased uncertainty around these projections.*

[116] Probabilistic projections for the height of sea level rise and the H++ scenario are presented. The H++ projection is a single scenario and does not have an associated likelihood of occurrence. Projections are with respect to a baseline year of 2000 (or more specifically, the average relative sea level over 1991-2009). Table is adapted from the 2018 OPC SLR Guidance to present only the three scenarios OPC recommends evaluating. Additionally, while the OPC tables include low emissions scenarios, only high emissions scenarios, which represent RCP 8.5, are included here because global greenhouse gas emissions are currently tracking along this trajectory. The Coastal Commission will continue to update best available science as necessary, including if emissions trajectories change.

APPENDIX G

APPENDIX G

RECOMMENDED GRADING SPECIFICATIONS

FOR

MARISOL
DEL MAR, CALIFORNIA

PROJECT NO. G1710-32-04

RECOMMENDED GRADING SPECIFICATIONS

1. GENERAL

1.1 These Recommended Grading Specifications shall be used in conjunction with the Geotechnical Report for the project prepared by Geocon. The recommendations contained in the text of the Geotechnical Report are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict.

1.2 Prior to the commencement of grading, a geotechnical consultant (Consultant) shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the recommendations of the Geotechnical Report and these specifications. The Consultant should provide adequate testing and observation services so that they may assess whether, in their opinion, the work was performed in substantial conformance with these specifications. It shall be the responsibility of the Contractor to assist the Consultant and keep them apprised of work schedules and changes so that personnel may be scheduled accordingly.

1.3 It shall be the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and the approved grading plans. If, in the opinion of the Consultant, unsatisfactory conditions such as questionable soil materials, poor moisture condition, inadequate compaction, and/or adverse weather result in a quality of work not in conformance with these specifications, the Consultant will be empowered to reject the work and recommend to the Owner that grading be stopped until the unacceptable conditions are corrected.

2. DEFINITIONS

2.1 **Owner** shall refer to the owner of the property or the entity on whose behalf the grading work is being performed and who has contracted with the Contractor to have grading performed.

2.2 **Contractor** shall refer to the Contractor performing the site grading work.

2.3 **Civil Engineer** or **Engineer of Work** shall refer to the California licensed Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topography.

2.4 **Consultant** shall refer to the soil engineering and engineering geology consulting firm retained to provide geotechnical services for the project.

2.5 **Soil Engineer** shall refer to a California licensed Civil Engineer retained by the Owner, who is experienced in the practice of geotechnical engineering. The Soil Engineer shall be responsible for having qualified representatives on-site to observe and test the Contractor's work for conformance with these specifications.

2.6 **Engineering Geologist** shall refer to a California licensed Engineering Geologist retained by the Owner to provide geologic observations and recommendations during the site grading.

2.7 **Geotechnical Report** shall refer to a soil report (including all addenda) which may include a geologic reconnaissance or geologic investigation that was prepared specifically for the development of the project for which these Recommended Grading Specifications are intended to apply.

3. MATERIALS

3.1 Materials for compacted fill shall consist of any soil excavated from the cut areas or imported to the site that, in the opinion of the Consultant, is suitable for use in construction of fills. In general, fill materials can be classified as *soil* fills, *soil-rock* fills or *rock* fills, as defined below.

3.1.1 **Soil fills** are defined as fills containing no rocks or hard lumps greater than 12 inches in maximum dimension and containing at least 40 percent by weight of material smaller than ¾ inch in size.

3.1.2 **Soil-rock fills** are defined as fills containing no rocks or hard lumps larger than 4 feet in maximum dimension and containing a sufficient matrix of soil fill to allow for proper compaction of soil fill around the rock fragments or hard lumps as specified in Paragraph 6.2. **Oversize rock** is defined as material greater than 12 inches.

3.1.3 **Rock fills** are defined as fills containing no rocks or hard lumps larger than 3 feet in maximum dimension and containing little or no fines. Fines are defined as material smaller than ¾ inch in maximum dimension. The quantity of fines shall be less than approximately 20 percent of the rock fill quantity.

3.2 Material of a perishable, spongy, or otherwise unsuitable nature as determined by the Consultant shall not be used in fills.

3.3 Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Code of Regulations, Title 22, Division 4, Chapter 30, Articles 9

and 10; 40CFR; and any other applicable local, state or federal laws. The Consultant shall not be responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request from the Owner the termination of grading operations within the affected area. Prior to resuming grading operations, the Owner shall provide a written report to the Consultant indicating that the suspected materials are not hazardous as defined by applicable laws and regulations.

3.4 The outer 15 feet of *soil-rock* fill slopes, measured horizontally, should be composed of properly compacted *soil* fill materials approved by the Consultant. *Rock* fill may extend to the slope face, provided that the slope is not steeper than 2:1 (horizontal:vertical) and a soil layer no thicker than 12 inches is track-walked onto the face for landscaping purposes. This procedure may be utilized provided it is acceptable to the governing agency, Owner and Consultant.

3.5 Samples of soil materials to be used for fill should be tested in the laboratory by the Consultant to determine the maximum density, optimum moisture content, and, where appropriate, shear strength, expansion, and gradation characteristics of the soil.

3.6 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered by the Contractor. The Consultant shall be notified immediately to evaluate the significance of the unanticipated condition.

4. CLEARING AND PREPARING AREAS TO BE FILLED

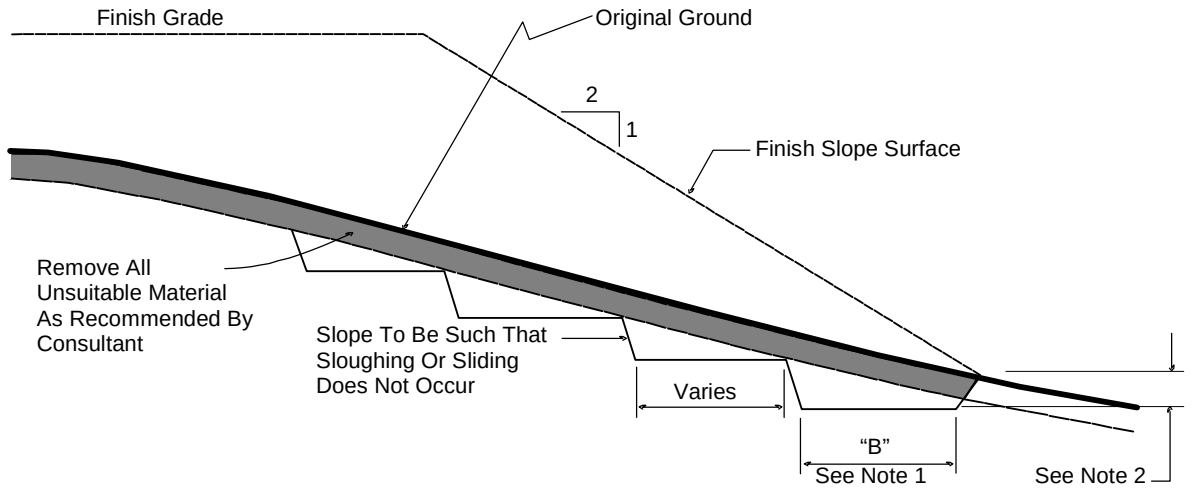
4.1 Areas to be excavated and filled shall be cleared and grubbed. Clearing shall consist of complete removal above the ground surface of trees, stumps, brush, vegetation, man-made structures, and similar debris. Grubbing shall consist of removal of stumps, roots, buried logs and other unsuitable material and shall be performed in areas to be graded. Roots and other projections exceeding 1½ inches in diameter shall be removed to a depth of 3 feet below the surface of the ground. Borrow areas shall be grubbed to the extent necessary to provide suitable fill materials.

4.2 Asphalt pavement material removed during clearing operations should be properly disposed at an approved off-site facility or in an acceptable area of the project evaluated by Geocon and the property owner. Concrete fragments that are free of reinforcing steel may be placed in fills, provided they are placed in accordance with Section 6.2 or 6.3 of this document.

4.3 After clearing and grubbing of organic matter and other unsuitable material, loose or porous soils shall be removed to the depth recommended in the Geotechnical Report. The depth of removal and compaction should be observed and approved by a representative of the Consultant. The exposed surface shall then be plowed or scarified to a minimum depth of 6 inches and until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.

4.4 Where the slope ratio of the original ground is steeper than 5:1 (horizontal:vertical), or where recommended by the Consultant, the original ground should be benched in accordance with the following illustration.

TYPICAL BENCHING DETAIL



No Scale

DETAIL NOTES: (1) Key width "B" should be a minimum of 10 feet, or sufficiently wide to permit complete coverage with the compaction equipment used. The base of the key should be graded horizontal, or inclined slightly into the natural slope.

(2) The outside of the key should be below the topsoil or unsuitable surficial material and at least 2 feet into dense formational material. Where hard rock is exposed in the bottom of the key, the depth and configuration of the key may be modified as approved by the Consultant.

4.5 After areas to receive fill have been cleared and scarified, the surface should be moisture conditioned to achieve the proper moisture content, and compacted as recommended in Section 6 of these specifications.

5. COMPACTION EQUIPMENT

5.1 Compaction of *soil* or *soil-rock* fill shall be accomplished by sheepsfoot or segmented-steel wheeled rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compaction equipment. Equipment shall be of such a design that it will be capable of compacting the *soil* or *soil-rock* fill to the specified relative compaction at the specified moisture content.

5.2 Compaction of *rock* fills shall be performed in accordance with Section 6.3.

6. PLACING, SPREADING AND COMPACTION OF FILL MATERIAL

6.1 *Soil* fill, as defined in Paragraph 3.1.1, shall be placed by the Contractor in accordance with the following recommendations:

6.1.1 *Soil* fill shall be placed by the Contractor in layers that, when compacted, should generally not exceed 8 inches. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to obtain uniformity of material and moisture in each layer. The entire fill shall be constructed as a unit in nearly level lifts. Rock materials greater than 12 inches in maximum dimension shall be placed in accordance with Section 6.2 or 6.3 of these specifications.

6.1.2 In general, the *soil* fill shall be compacted at a moisture content at or above the optimum moisture content as determined by ASTM D 1557.

6.1.3 When the moisture content of *soil* fill is below that specified by the Consultant, water shall be added by the Contractor until the moisture content is in the range specified.

6.1.4 When the moisture content of the *soil* fill is above the range specified by the Consultant or too wet to achieve proper compaction, the *soil* fill shall be aerated by the Contractor by blading/mixing, or other satisfactory methods until the moisture content is within the range specified.

6.1.5 After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted by the Contractor to a relative compaction of at least 90 percent. Relative compaction is defined as the ratio (expressed in percent) of the in-place dry density of the compacted fill to the maximum laboratory dry density as determined in accordance with ASTM D 1557. Compaction shall be continuous over the entire area, and compaction equipment shall make sufficient passes so that the specified minimum relative compaction has been achieved throughout the entire fill.

6.1.6 Where practical, soils having an Expansion Index greater than 50 should be placed at least 3 feet below finish pad grade and should be compacted at a moisture content generally 2 to 4 percent greater than the optimum moisture content for the material.

6.1.7 Properly compacted *soil* fill shall extend to the design surface of fill slopes. To achieve proper compaction, it is recommended that fill slopes be over-built by at least 3 feet and then cut to the design grade. This procedure is considered preferable to track-walking of slopes, as described in the following paragraph.

6.1.8 As an alternative to over-building of slopes, slope faces may be back-rolled with a heavy-duty loaded sheepsfoot or vibratory roller at maximum 4-foot fill height intervals. Upon completion, slopes should then be track-walked with a D-8 dozer or similar equipment, such that a dozer track covers all slope surfaces at least twice.

6.2 *Soil-rock* fill, as defined in Paragraph 3.1.2, shall be placed by the Contractor in accordance with the following recommendations:

6.2.1 Rocks larger than 12 inches but less than 4 feet in maximum dimension may be incorporated into the compacted *soil* fill, but shall be limited to the area measured 15 feet minimum horizontally from the slope face and 5 feet below finish grade or 3 feet below the deepest utility, whichever is deeper.

6.2.2 Rocks or rock fragments up to 4 feet in maximum dimension may either be individually placed or placed in windrows. Under certain conditions, rocks or rock fragments up to 10 feet in maximum dimension may be placed using similar methods. The acceptability of placing rock materials greater than 4 feet in maximum dimension shall be evaluated during grading as specific cases arise and shall be approved by the Consultant prior to placement.

6.2.3 For individual placement, sufficient space shall be provided between rocks to allow for passage of compaction equipment.

6.2.4 For windrow placement, the rocks should be placed in trenches excavated in properly compacted *soil* fill. Trenches should be approximately 5 feet wide and 4 feet deep in maximum dimension. The voids around and beneath rocks should be filled with approved granular soil having a Sand Equivalent of 30 or greater and should be compacted by flooding. Windrows may also be placed utilizing an "open-face" method in lieu of the trench procedure, however, this method should first be approved by the Consultant.

6.2.5 Windrows should generally be parallel to each other and may be placed either parallel to or perpendicular to the face of the slope depending on the site geometry. The minimum horizontal spacing for windrows shall be 12 feet center-to-center with a 5-foot stagger or offset from lower courses to next overlying course. The minimum vertical spacing between windrow courses shall be 2 feet from the top of a lower windrow to the bottom of the next higher windrow.

6.2.6 Rock placement, fill placement and flooding of approved granular soil in the windrows should be continuously observed by the Consultant.

6.3 *Rock* fills, as defined in Section 3.1.3, shall be placed by the Contractor in accordance with the following recommendations:

6.3.1 The base of the *rock* fill shall be placed on a sloping surface (minimum slope of 2 percent). The surface shall slope toward suitable subdrainage outlet facilities. The *rock* fills shall be provided with subdrains during construction so that a hydrostatic pressure buildup does not develop. The subdrains shall be permanently connected to controlled drainage facilities to control post-construction infiltration of water.

6.3.2 *Rock* fills shall be placed in lifts not exceeding 3 feet. Placement shall be by rock trucks traversing previously placed lifts and dumping at the edge of the currently placed lift. Spreading of the *rock* fill shall be by dozer to facilitate *seating* of the rock. The *rock* fill shall be watered heavily during placement. Watering shall consist of water trucks traversing in front of the current rock lift face and spraying water continuously during rock placement. Compaction equipment with compactive energy comparable to or greater than that of a 20-ton steel vibratory roller or other compaction equipment providing suitable energy to achieve the required compaction or deflection as recommended in Paragraph 6.3.3 shall be utilized. The number of passes to be made should be determined as described in Paragraph 6.3.3. Once a *rock* fill lift has been covered with *soil* fill, no additional *rock* fill lifts will be permitted over the *soil* fill.

6.3.3 Plate bearing tests, in accordance with ASTM D 1196, may be performed in both the compacted *soil* fill and in the *rock* fill to aid in determining the required minimum number of passes of the compaction equipment. If performed, a minimum of three plate bearing tests should be performed in the properly compacted *soil* fill (minimum relative compaction of 90 percent). Plate bearing tests shall then be performed on areas of *rock* fill having two passes, four passes and six passes of the compaction equipment, respectively. The number of passes required for the *rock* fill shall be determined by comparing the results of the plate bearing tests for the *soil* fill and the *rock* fill and by evaluating the deflection

variation with number of passes. The required number of passes of the compaction equipment will be performed as necessary until the plate bearing deflections are equal to or less than that determined for the properly compacted *soil* fill. In no case will the required number of passes be less than two.

6.3.4 A representative of the Consultant should be present during *rock* fill operations to observe that the minimum number of "passes" have been obtained, that water is being properly applied and that specified procedures are being followed. The actual number of plate bearing tests will be determined by the Consultant during grading.

6.3.5 Test pits shall be excavated by the Contractor so that the Consultant can state that, in their opinion, sufficient water is present and that voids between large rocks are properly filled with smaller rock material. In-place density testing will not be required in the *rock* fills.

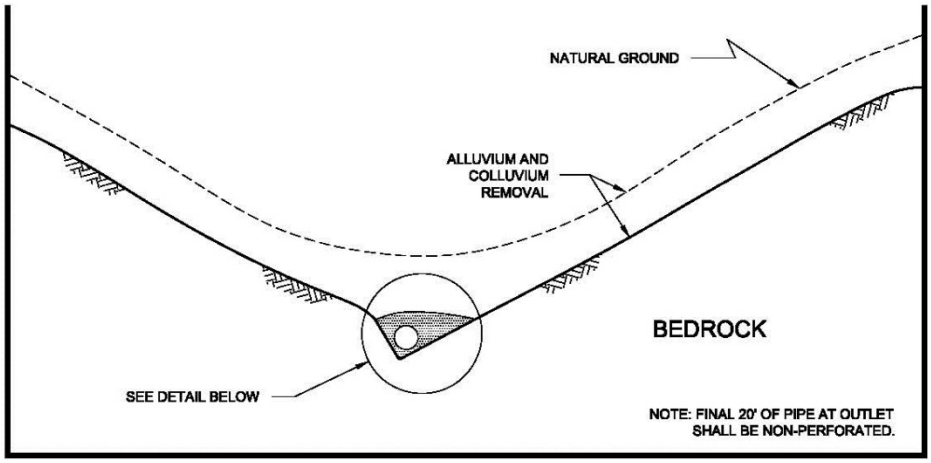
6.3.6 To reduce the potential for "piping" of fines into the *rock* fill from overlying *soil* fill material, a 2-foot layer of graded filter material shall be placed above the uppermost lift of *rock* fill. The need to place graded filter material below the *rock* should be determined by the Consultant prior to commencing grading. The gradation of the graded filter material will be determined at the time the *rock* fill is being excavated. Materials typical of the *rock* fill should be submitted to the Consultant in a timely manner, to allow design of the graded filter prior to the commencement of *rock* fill placement.

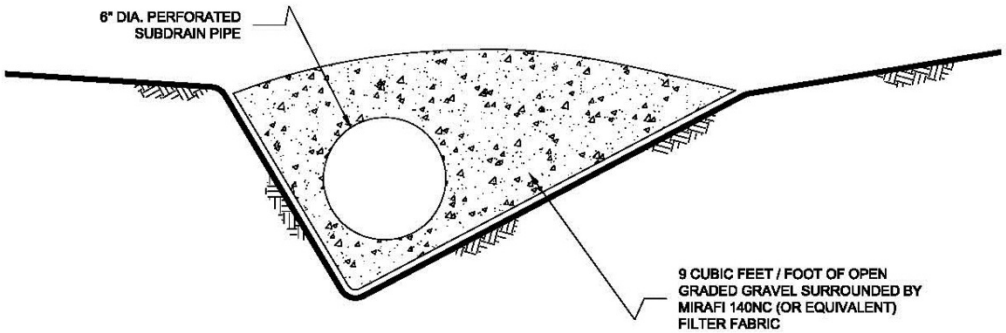
6.3.7 *Rock* fill placement should be continuously observed during placement by the Consultant.

7. SUBDRAINS

7.1 The geologic units on the site may have permeability characteristics and/or fracture systems that could be susceptible under certain conditions to seepage. The use of canyon subdrains may be necessary to mitigate the potential for adverse impacts associated with seepage conditions. Canyon subdrains with lengths in excess of 500 feet or extensions of existing offsite subdrains should use 8-inch-diameter pipes. Canyon subdrains less than 500 feet in length should use 6-inch-diameter pipes.

TYPICAL CANYON DRAIN DETAIL





NOTES:

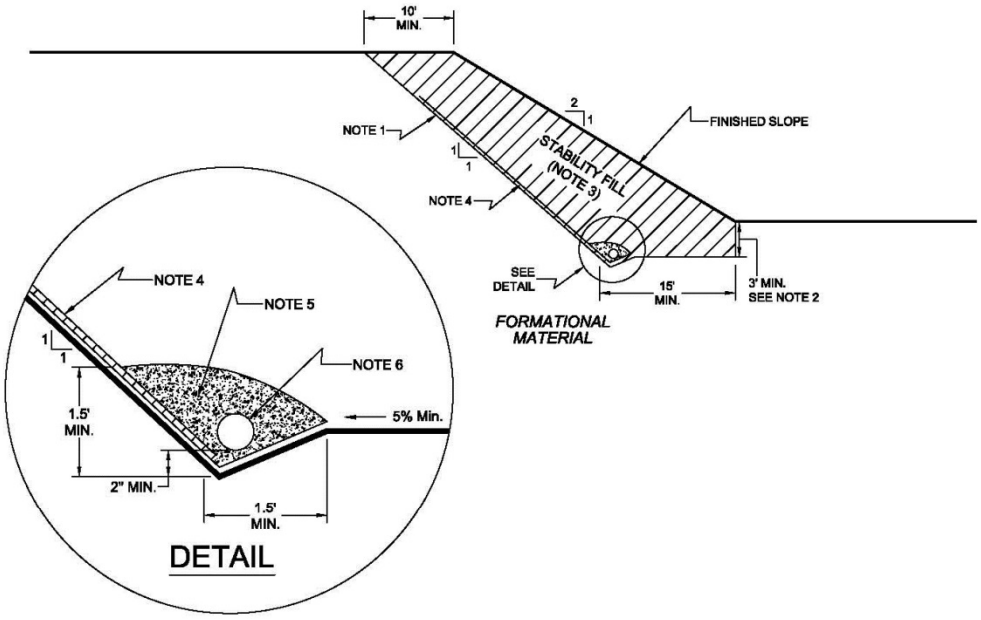
1.....6-INCH DIAMETER, SCHEDULE 80 PVC PERFORATED PIPE FOR FILLS
IN EXCESS OF 100-FEET IN DEPTH OR A PIPE LENGTH OF LONGER THAN 500 FEET.

2.....6-INCH DIAMETER, SCHEDULE 40 PVC PERFORATED PIPE FOR FILLS
LESS THAN 100-FEET IN DEPTH OR A PIPE LENGTH SHORTER THAN 500 FEET.

NO SCALE

7.2 Slope drains within stability fill keyways should use 4-inch-diameter (or lager) pipes.

TYPICAL STABILITY FILL DETAIL



NOTES:

1.....EXCAVATE BACKCUT AT 1:1 INCLINATION (UNLESS OTHERWISE NOTED).

2.....BASE OF STABILITY FILL TO BE 3 FEET INTO FORMATIONAL MATERIAL, SLOPING A MINIMUM 5% INTO SLOPE.

3.....STABILITY FILL TO BE COMPOSED OF PROPERLY COMPACTED GRANULAR SOIL.

4.....CHIMNEY DRAINS TO BE APPROVED PREFABRICATED CHIMNEY DRAIN PANELS (MIRADRAIN G200N OR EQUIVALENT) SPACED APPROXIMATELY 20 FEET CENTER TO CENTER AND 4 FEET WIDE. CLOSER SPACING MAY BE REQUIRED IF SEEPAGE IS ENCOUNTERED.

5.....FILTER MATERIAL TO BE 3/4-INCH, OPEN-GRADED CRUSHED ROCK ENCLOSED IN APPROVED FILTER FABRIC (MIRAFI 140NC).

6.....COLLECTOR PIPE TO BE 4-INCH MINIMUM DIAMETER, PERFORATED, THICK-WALLED PVC SCHEDULE 40 OR EQUIVALENT, AND SLOPED TO DRAIN AT 1 PERCENT MINIMUM TO APPROVED OUTLET.

NO SCALE

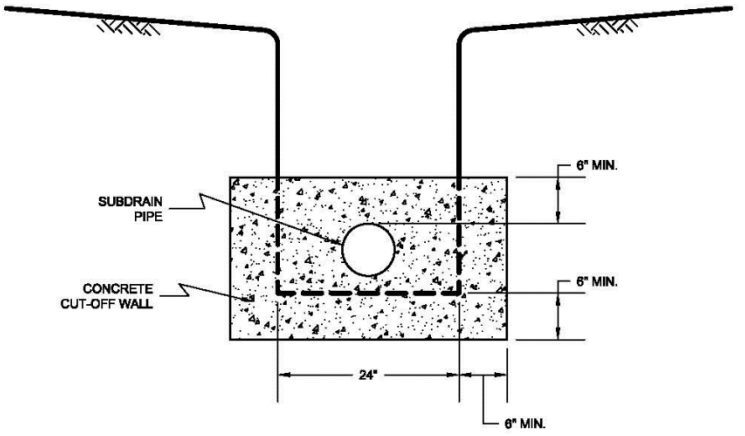
7.3 The actual subdrain locations will be evaluated in the field during the remedial grading operations. Additional drains may be necessary depending on the conditions observed and the requirements of the local regulatory agencies. Appropriate subdrain outlets should be evaluated prior to finalizing 40-scale grading plans.

7.4 *Rock* fill or *soil-rock* fill areas may require subdrains along their down-slope perimeters to mitigate the potential for buildup of water from construction or landscape irrigation. The subdrains should be at least 6-inch-diameter pipes encapsulated in gravel and filter fabric. *Rock* fill drains should be constructed using the same requirements as canyon subdrains.

7.5 Prior to outletting, the final 20-foot segment of a subdrain that will not be extended during future development should consist of non-perforated drainpipe. At the non-perforated/ perforated interface, a seepage cutoff wall should be constructed on the downslope side of the pipe.

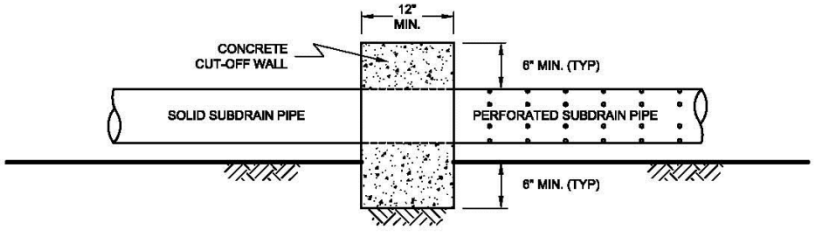
TYPICAL CUT OFF WALL DETAIL

FRONT VIEW



NO SCALE

SIDE VIEW

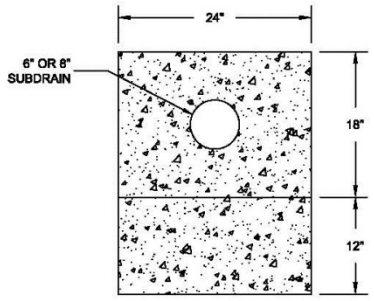


NO SCALE

7.6 Subdrains that discharge into a natural drainage course or open space area should be provided with a permanent headwall structure.

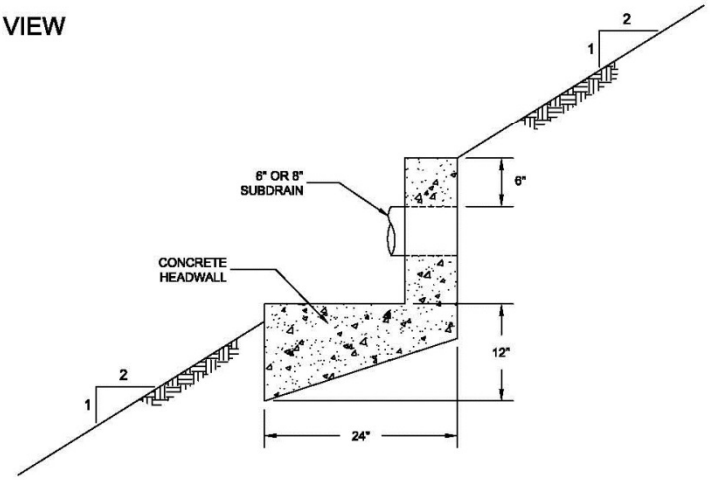
TYPICAL HEADWALL DETAIL

FRONT VIEW



NO SCALE

SIDE VIEW



NOTE: HEADWALL SHOULD OUTLET AT TOE OF FILL SLOPE OR INTO CONTROLLED SURFACE DRAINAGE

NO SCALE

7.7 The final grading plans should show the location of the proposed subdrains. After completion of remedial excavations and subdrain installation, the project civil engineer should survey the drain locations and prepare an “as-built” map showing the drain locations. The final outlet and connection locations should be determined during grading operations. Subdrains that will be extended on adjacent projects after grading can be placed on formational material and a vertical riser should be placed at the end of the subdrain. The grading contractor should consider videoing the subdrains shortly after burial to check proper installation and functionality. The contractor is responsible for the performance of the drains.

8. OBSERVATION AND TESTING

8.1 The Consultant shall be the Owner's representative to observe and perform tests during clearing, grubbing, filling, and compaction operations. In general, no more than 2 feet in vertical elevation of *soil* or *soil-rock* fill should be placed without at least one field density test being performed within that interval. In addition, a minimum of one field density test should be performed for every 2,000 cubic yards of *soil* or *soil-rock* fill placed and compacted.

8.2 The Consultant should perform a sufficient distribution of field density tests of the compacted *soil* or *soil-rock* fill to provide a basis for expressing an opinion whether the fill material is compacted as specified. Density tests shall be performed in the compacted materials below any disturbed surface. When these tests indicate that the density of any layer of fill or portion thereof is below that specified, the particular layer or areas represented by the test shall be reworked until the specified density has been achieved.

8.3 During placement of *rock* fill, the Consultant should observe that the minimum number of passes have been obtained per the criteria discussed in Section 6.3.3. The Consultant should request the excavation of observation pits and may perform plate bearing tests on the placed *rock* fills. The observation pits will be excavated to provide a basis for expressing an opinion as to whether the *rock* fill is properly seated and sufficient moisture has been applied to the material. When observations indicate that a layer of *rock* fill or any portion thereof is below that specified, the affected layer or area shall be reworked until the *rock* fill has been adequately seated and sufficient moisture applied.

8.4 A settlement monitoring program designed by the Consultant may be conducted in areas of *rock* fill placement. The specific design of the monitoring program shall be as recommended in the Conclusions and Recommendations section of the project Geotechnical Report or in the final report of testing and observation services performed during grading.

8.5 We should observe the placement of subdrains, to check that the drainage devices have been placed and constructed in substantial conformance with project specifications.

8.6 Testing procedures shall conform to the following Standards as appropriate:

8.6.1 Soil and Soil-Rock Fills:

8.6.1.1 Field Density Test, ASTM D 1556, *Density of Soil In-Place By the Sand-Cone Method.*

8.6.1.2 Field Density Test, Nuclear Method, ASTM D 6938, *Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).*

8.6.1.3 Laboratory Compaction Test, ASTM D 1557, *Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Pound Hammer and 18-Inch Drop.*

8.6.1.4. Expansion Index Test, ASTM D 4829, *Expansion Index Test*.

9. PROTECTION OF WORK

9.1 During construction, the Contractor shall properly grade all excavated surfaces to provide positive drainage and prevent ponding of water. Drainage of surface water shall be controlled to avoid damage to adjoining properties or to finished work on the site. The Contractor shall take remedial measures to prevent erosion of freshly graded areas until such time as permanent drainage and erosion control features have been installed. Areas subjected to erosion or sedimentation shall be properly prepared in accordance with the Specifications prior to placing additional fill or structures.

9.2 After completion of grading as observed and tested by the Consultant, no further excavation or filling shall be conducted except in conjunction with the services of the Consultant.

10. CERTIFICATIONS AND FINAL REPORTS

10.1 Upon completion of the work, Contractor shall furnish Owner a certification by the Civil Engineer stating that the lots and/or building pads are graded to within 0.1 foot vertically of elevations shown on the grading plan and that all tops and toes of slopes are within 0.5 foot horizontally of the positions shown on the grading plans. After installation of a section of subdrain, the project Civil Engineer should survey its location and prepare an *as-built* plan of the subdrain location. The project Civil Engineer should verify the proper outlet for the subdrains and the Contractor should ensure that the drain system is free of obstructions.

10.2 The Owner is responsible for furnishing a final as-graded soil and geologic report satisfactory to the appropriate governing or accepting agencies. The as-graded report should be prepared and signed by a California licensed Civil Engineer experienced in geotechnical engineering and by a California Certified Engineering Geologist, indicating that the geotechnical aspects of the grading were performed in substantial conformance with the Specifications or approved changes to the Specifications.

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34. 1932, Flight, C-1980, Frame 69, February 27, Scale 1:9,600;

35. 1932, Flight, C-1980, Frame 70, February 27, Scale 1:9,600;

36. 1932, Flight, C-1980, Frame Z-109, February 27, Scale 1:9,600;

37. 1932, Flight, C-1980, Frame Z-110, February 27, Scale 1:9,600.

Appendix G

Noise Analysis Technical Report

Noise Analysis Technical Report for the Marisol Specific Plan Project City of Del Mar, California

Prepared for:

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Del Mar, California 92014

Prepared by:

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NOVEMBER 2019

Printed on 30% post-consumer recycled material.

TABLE OF CONTENTS

Section **Page No.**

EXECUTIVE SUMMARY ..... **V**

1 INTRODUCTION **1**
1.1 Report Purpose and Scope 1
1.2 Project Location 1
1.3 Project Description 1

2 EXISTING CONDITIONS **7**
2.1 Noise and Vibration Concepts 7
2.2 Existing Noise Environment 10

3 REGULATORY SETTING **15**
3.1 Federal 15
3.2 State 15
3.3 Local 16

4 THRESHOLDS OF SIGNIFICANCE **21**

5 IMPACTS AND MITIGATION **23**
5.1 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 23
5.2 Excessive Groundborne Vibration or Groundborne Noise Levels 35
5.3 Private Airstrip or Airport 36
5.4 Cumulative Impacts 36
5.5 Mitigation 37

6 SUMMARY AND CONCLUSIONS **39**

7 REFERENCES **41**

8 LIST OF PREPARERS **43**

APPENDICES

A Field Noise Measurement Data
B Construction Noise Modeling Input/Output Files
C Traffic Noise Modeling Input/Output Files
D Rail Noise Modeling Input/Output Files

TABLE OF CONTENTS (CONTINUED)

Page No.

FIGURES

1 Regional Map 3
2 Vicinity Map 5
3 Noise Measurement and Off-Site Modeling Locations 13
4 Modeled On-Site Receivers 33

TABLES

1 Typical Sound Levels 8
2 Short-Term Sound Level Measurement Results 11
3 City of Del Mar Noise Ordinance Limits 17
4 Construction Equipment Noise Emissions Levels 24
5 Construction Noise Analysis Summary 25
6 Summary of Off-Site Existing and Future (Year 2035) Unmitigated Traffic Noise Levels (dBA CNEL) 26
7 Summary of On-Site Future (Year 2035) plus Project Unmitigated Traffic Noise Levels (dBA CNEL) 29
8 Summary of On-Site Future plus Project Unmitigated Traffic plus Rail Noise Levels (dBA CNEL) 30

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
APN	Assessor's Parcel Number
CEQA	California Environmental Quality Act
CNEL	community noise equivalent level
dB	decibel
dBA	A-weighted decibel
FTA	Federal Transit Administration
HVAC	Heating, Ventilation and Air Conditioning
IPS	inches per second
L_{dn}	day-night average sound level
L_{eq}	equivalent sound level
MM	Mitigation Measure
PPV	peak particle velocity
TNM	Traffic Noise Model
VdB	Vibration decibel

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EXECUTIVE SUMMARY

The purpose of this technical report is to assess the potential noise and vibration impacts associated with implementation of the proposed Marisol Resort Project (Project). This assessment utilizes the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.).

The Plan Area includes approximately 17.45 acres of land, located at Border Avenue and west of Camino Del Mar, as well as a portion east of Camino Del Mar, in the northwestern corner of the City of Del Mar. The Plan Area is comprised of 16.55 acres of privately owned land, 0.78-acre of public right-of-way along Camino Del Mar, and a 0.12-acre City coastal viewing access parcel located at the northern extent of the Plan Area. The Specific Plan Area would be accessible from the intersection of South Sierra Avenue and Border Avenue on the northern side of the Plan Area.

The project consists of a Specific Plan including five land use sub-designations: Visitor Serving Accommodations (VSA), Parkland/Passive Open Space (PPOS), Coastal Bluff Protection Area (CBPA) and Steep Slope Protection Area (SSPA). The VSA land use sub-designation allows for the development of approximately 65 guest rooms, 31 villas (some of which may be used as guest rooms when not in use by owners, subject to provisions in the Specific Plan), 10 lower-cost shared visitor-serving accommodations, 22 affordable housing units, and associated amenities. Amenities include, but are not limited to, restaurants, bar/lounge, special event space, meeting space, swimming pools, a spa and fitness center and retail.

The PPOS land use sub-designation allows for public amenities such as trails, vista points, picnic areas, public access stairway and public restrooms, and passive recreational uses. Passive recreational uses are defined in the Specific plan as low intensity recreational activities that require little or no infrastructure and that are geared toward the viewing and appreciation of scenic and environmentally sensitive areas.

This noise analysis evaluates the potential for significant adverse impacts due to Project construction and operation. Implementation of the Project would result in two primary types of potential noise impacts: short-term (i.e., temporary) noise during construction and long-term noise during operation.

Noise from construction would exceed the 75-decibel construction noise standard established in the City of Del Mar's Noise Control Ordinance at adjacent noise-sensitive receivers; therefore, impacts would be significant. To reduce construction noise impacts, mitigation measure (MM) MM-NOI-1 is required. Implementation of MM-NOI-1 would reduce construction-related noise impacts to a level that is **less than significant**. The Project's traffic-related impacts would not

result in a noise level increase along adjacent roadways; therefore, traffic noise impacts would be **less than significant** at off-site land uses. On-site mechanical equipment (such as heating, ventilation and air conditioning (HVAC) equipment) has the potential to result in noise levels in excess of City of Del Mar noise standards; implementation of mitigation measure MM-NOI-2 would ensure that noise from mechanical equipment does not exceed applicable noise standards. Mitigation measure MM-NOI-3 would specify limits on hours for pool and other recreational area usage, as well as the use of amplified music, to ensure that noise from hotel guests and activities is less than significant. Vibration levels associated with Project construction would likely be perceptible at nearby residences, but they would be below the Federal Transit Administration (FTA) threshold of potential damage for normal structures (0.20 peak particle velocity in inches per second) and would not be considered excessive. The Project site is not located within the vicinity of an airport or private airstrip and, therefore, would not expose people residing or working in the Project area to excessive noise levels associated with an airport or airstrip. Finally, the noise analysis concludes that the Project would not result in any significant cumulative impacts.

1 INTRODUCTION

1.1 Report Purpose and Scope

The purpose of this report is to evaluate the potential noise and vibration impacts associated with implementation of the Marisol Resort Project (Project).

1.2 Project Location

The project site is located south of Border Avenue and west of Camino Del Mar, in the northwestern corner of the City of Del Mar (City), within coastal Southern California. The site comprises eight parcels, seven of which are vacant. A one-story 5,800 square foot residence (with accessory garage structure and pool cabana building) is located on the most southern parcel of the project site. See Figure 1, Regional Map, and Figure 2, Vicinity Map.

The Plan Area comprises eight parcels, seven of which are vacant (APNs 298-241-06, 07, 29, -34, -35, and -36, and 299-030-14 and –15) as shown on the aerial photo on the next page. As of 2018, the Plan Area is mostly disturbed, vacant land with a 5,800-square-foot residence remaining on the most southern parcel of the Plan Area with an accessory garage structure and pool cabana building (APN 299-030-1500).

1.3 Project Description

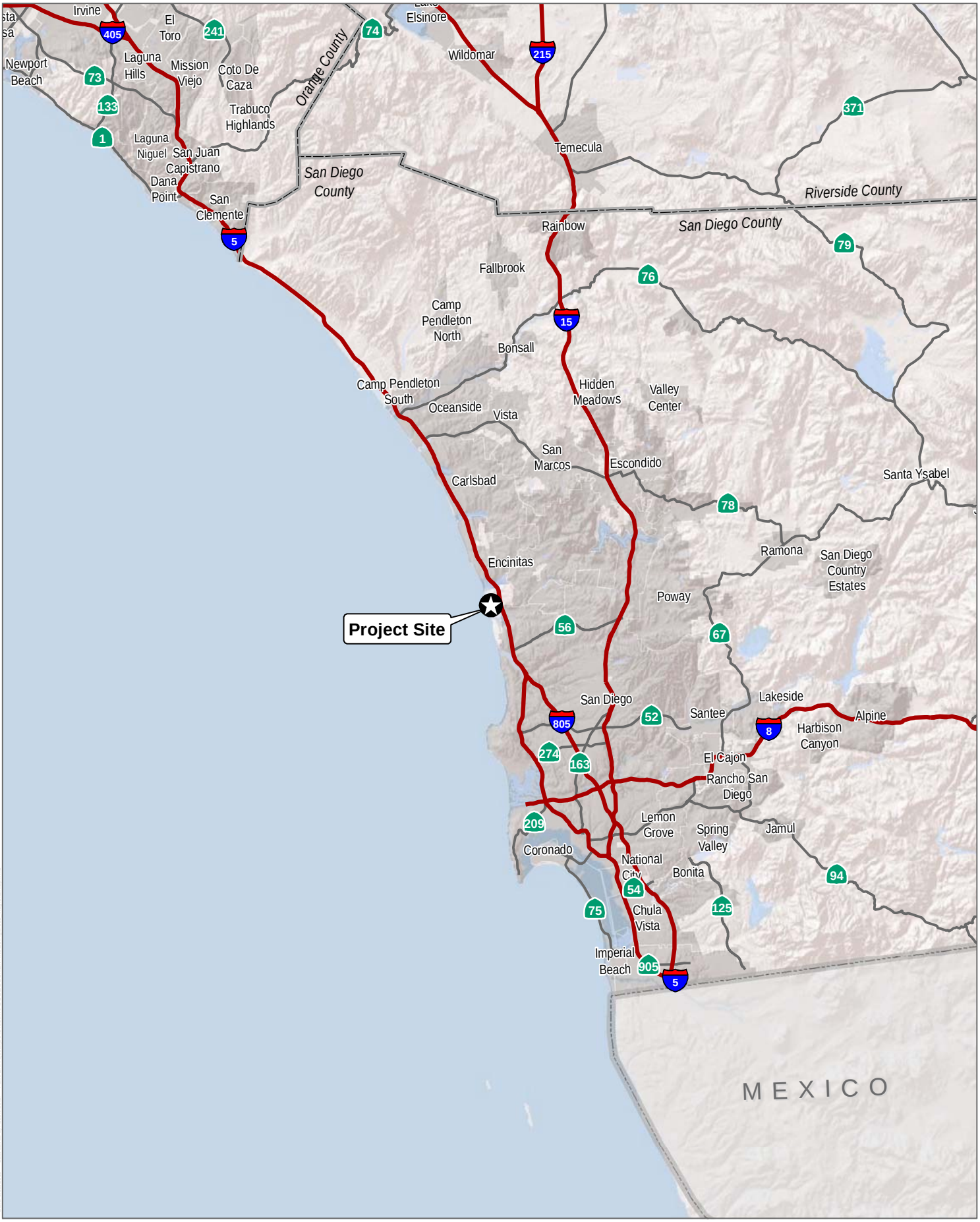
The Plan Area includes approximately 17.45 acres of land, located at Border Avenue and west of Camino Del Mar, as well as a portion east of Camino Del Mar, in the northwestern corner of the City. The Plan Area is comprised of 16.55 acres of privately owned land, 0.78-acre of public right-of-way along Camino Del Mar, and a 0.12-acre City coastal viewing access parcel located at the northern extent of the Plan Area. The Specific Plan Area would be accessible from the intersection of South Sierra Avenue and Border Avenue on the northern side of the Plan Area

The project consists of a Specific Plan including five land use sub-designations: Visitor Serving Accommodations (VSA), Parkland/Passive Open Space (PPOS), Coastal Bluff Protection Area (CBPA) and Steep Slope Protection Area (SSPA). The VSA land use sub-designation allows for the development of approximately 65 guest rooms, 31 villas (some of which may be used as guest rooms when not in use by owners, subject to provisions in the Specific Plan), 10 lower-cost shared visitor-serving accommodations, 22 affordable housing units, and associated amenities. Amenities include, but are not limited to, restaurants, bar/lounge, special event space, meeting space, swimming pools, a spa and fitness center and retail.

The PPOS land use sub-designation allows for public amenities such as trails, vista points, picnic areas, public access stairway and public restrooms, and passive recreational uses. Passive recreational uses are defined in the Specific plan as low intensity recreational activities that require little or no infrastructure and that are geared toward the viewing and appreciation of scenic and environmentally sensitive areas.

The CBPA and SSPA land use sub-designations serve as protection areas. The only disturbance allowed within the CBPA is the minimal amount necessary to install drainage control measures to protect a coastal bluff area from degradation and/or erosion. Shoreline protection devices are prohibited in this area. The only disturbance allowed within the SSPA is the minimal amount necessary to provide a public access stairway, public restrooms, and related facilities for resort and public visitor services at the toe of slope; to implement drainage control measures to protect the steep slope area from degradation and/or erosion; and to allow interpretive signage and pathway lighting.

Off-site improvements include a new potable water main for the Project to extend into the City in order to find a suitable connection point. The existing water mains servicing the northernmost houses before the entrance to the lagoon are currently served by either an existing 4-inch or 6-inch water main, which would not have sufficient capacity to serve as the connection point for the new water main. Two alternatives for the proposed water main are being analyzed. Both alternatives consist of constructing a new 16-inch diameter pipeline. One alternative is to construct approximately 4,500 linear feet of new 16-inch water main in Via de la Valle from the intersection of Via de la Valle San Dieguito Drive and Jimmy Durante Boulevard to via 28th Street and Camino Del Mar within the City. The second alternative would construct approximately 5,000 linear feet of 16-inch pipe connected to an existing 20-inch City pipeline beginning on the west side of the intersection of Jimmy Durante Boulevard and San Dieguito Drive. This pipeline would extend northwest, following the Public Works Yard paved access road, then go along the dirt access road adjacent to the Public Works Yard up to the proposed crossing of the railroad right-of-way and drainage ditch. The work to cross the railroad right-of-way and drainage ditch would be done using a jack-and-bore construction method to avoid interruption of these resources. Then the pipeline would continue west via 27th or 28th Street to Camino Del Mar, then north to Via De La Valle. This alternative would replace existing pipelines south of Sandy Lane and construct new pipelines north of Sandy Lane to Via de la Valle. All pipeline construction and replacement would occur within paved roads, City and North County Transit District right-of-way, or the Public Works yard.



SOURCE: Esri Basemaps (2017)

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FIGURE 1

Regional Map

Del Mar Resort Noise Technical Report

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SOURCE: Bing Maps (Accessed 2017)

0 1,000 2,000 Feet

FIGURE 2

Vicinity Map

Marisol Specific Plan Project Noise Technical Report

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2 EXISTING CONDITIONS

2.1 Noise and Vibration Concepts

Noise is generally defined as loud, unexpected, or undesired sound typically associated with human activity that interferes with or disrupts normal activities. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm, or when it has adverse effects on health. The definition of noise as unwanted sound implies that it has an adverse effect on people and their environment.

Sound is measured in terms of intensity, which describes the sound's loudness and is measured in decibels (dB), frequency or pitch measured in cycles per second or hertz, and duration of sound. Sound is composed of various frequencies; however, the human ear does not respond to all frequencies, being less sensitive to very low and high frequencies than to medium frequencies that correspond with human speech. Sound-level meters adjust for the weight the human ear gives to certain frequencies, applying a correction to each frequency range to approximate the human ear's sensitivity within each range. This is called "A-weighting" and is commonly used in measurements of community environmental noise. The A-weighted sound level, abbreviated dBA, is determined to be the most appropriate unit of measure for community noise.

The unit of measure for the cumulative effect of community noise is the community noise equivalent level (CNEL), which is the average noise level for a 24-hour period. The CNEL noise metric (similarly to the L_{dn}, or level day-night noise metric) is often used to describe the relationship of a continuous noise source, such as traffic, to the desirable ambient noise level (normal and existing noise level). The CNEL is adjusted to reflect greater sensitivity to noise during evening and nighttime hours, with a 5-dBA penalty assigned to noise between 7:00 p.m. and 10:00 p.m., and a 10-dBA penalty assigned to noise between 10:00 p.m. and 7:00 a.m. The L_{dn} noise metric also uses a penalty of 10 dBA for noise occurring between 10:00 p.m. and 7:00 a.m., but no penalty is applied between 7:00 p.m. and 10:00 p.m. The functional difference between the CNEL and L_{dn} metrics is typically minimal (on the order of 0.2 dB or less), and thus the two are often used interchangeably.

Due to fluctuations in community noise over time, a single measurement called the equivalent sound level (L_{eq}) is often used to describe the time-varying character of community noise. The L_{eq} is the energy-averaged A-weighted sound level during a measured time interval, and it is equal to the level of a continuous, steady sound containing the same total acoustical energy over the averaging time period as the actual time-varying sound.

To respond to the human ear's sensitivity to sound, the range of audible sounds exists on a logarithmic scale that takes into account the large differences in audible sound intensities. On this scale, for example, a 10-dBA increase is typically perceived as a doubling of sound. A sound level of 0 dB is approximately the threshold of human hearing. Normal speech has a sound level of approximately 60 dB. Sound levels louder than approximately 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at slightly higher levels. The minimum change in the sound level of individual events that an average human ear can detect in the community environment (i.e., outside of a controlled listening room) is approximately 3 dB.

There are three conceptual components to noise: the source, the transmission path, and the receiver. Noise can be reduced by reducing noise at its source; by lengthening or interrupting the transmission path through diversion, absorption, or dissipation; or by protecting the receiver through noise insulation. The most efficient and effective means of abating noise is to reduce noise at its source. Source noise can be controlled through regulation, such as following restrictions outlined in noise ordinances; muffling techniques; or sound proofing. The transmission path can be interrupted through creation of a buffer between the source and the receiver, such as a noise wall, earth embankment, or a building. The receiver can be protected from noise impacts through insulation, building orientation, or shielded areas.

Noise sources can be classified in two forms: point sources, such as individual pieces of stationary or mobile equipment (pumps, heavy construction equipment), and line sources, such as a roadway with a large number of pass-by sources (motor vehicles). Sound generated by a point source typically diminishes (attenuates) at a rate of 6 dBA for each doubling of distance from the source to the receptor. For example, a 60-dBA noise level measured at 50 feet from a point source would be 54 dBA at 100 feet from the source and 48 dBA at 200 feet from the source. Sound generated by a line source typically attenuates at a rate of 3 dBA and 4.5 dBA per doubling of distance from the source to the receptor for hard and soft sites, respectively. Typical sound levels generated by various activities are listed in Table 1.

Table 1
Typical Sound Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1,000 feet		
	— 100 —	
Gas lawnmower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 miles per hour		Food blender at 3 feet

Table 1
Typical Sound Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 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 hall (background)
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans 2009.

Sound levels can also be attenuated by built or natural barriers. Intervening noise barriers, such as a solid wall or berm, typically reduce noise levels by 5 dBA to 10 dBA. Structures can also provide noise reduction by insulating interior spaces from outdoor noise. The exterior-to-interior noise attenuation provided by typical California building structures ranges from 15 dBA to 25 dBA for windows open and closed, respectively. Acoustically designed enclosures and buildings can provide up to approximately 50 dBA of noise reduction, depending on the noise abatement treatments.

Vibration tolerance typically depends on the type of structures that are affected. Structural response to vibration is typically evaluated in terms of peak particle velocity (PPV). PPV is often used since it is related to the stresses that are experienced by the buildings. Various general standards are contained in the International Standards Organization's standards 3945, 4866, and 7626-1. Limits set by these standards indicate a low probability of structural damage occurring to common structures at a PPV of 2 inches per second (IPS). Older (and non-reinforced) masonry structures have a limit of 0.75 IPS to 1.0 IPS (Caltrans 2013). The FTA identifies a vibration damage threshold criterion of 0.20 IPS for non-engineered timber and masonry buildings (i.e., fragile buildings) and 0.12 IPS for buildings extremely susceptible to vibration (i.e., fragile historic buildings) (FTA 2018). The FTA (among other agencies) also expresses vibration levels are in terms of dB relative to one microinch per second (abbreviated as VdB). Using this metric, the threshold of perception is approximately 65 VdB. Typical background

vibration levels are between 50 and 60 VdB, and FTA's threshold for acceptable groundborne vibration for residential uses of 72 VdB (FTA 2018).

2.2 Existing Noise Environment

A sound level survey was conducted on October 30, 2017, to evaluate existing sound levels and assess potential Project noise impacts on the surrounding area. Short-term sound levels were measured at existing noise-sensitive receptors adjacent to the Project area, as shown in Figure 3, Noise Measurement and Off-Site Modeling Locations. Noise measurements were taken northeast of the North Bluff Preserve, located south of the project site (ST1) and adjacent to nearby residences (ST2, ST3, ST4).

Short-term (1 hour or less), attended sound level measurements were taken with a Rion NL-32 Sound Level Meter. This instrument is categorized as Type 1, Precision Grade. The sound measuring instrument used for the survey was set to the "Slow" time response and the dBA scale for all noise measurements. To ensure accuracy, the laboratory calibration of the instrument was field checked before and after each measurement period using an acoustical calibrator. The accuracy of the acoustical calibrator is maintained through a program established through the manufacturer and traceable to the National Institute of Standards and Technology. The sound measurement instrument meets the requirements of American National Standards Institute Standard S 1.4-1983 and International Electrotechnical Commission Publications 804 and 651. In all cases, the microphone height was 5 feet above the ground, and the microphone was equipped with a windscreen.

During the field measurements, physical observations of the predominant noise sources were noted. The primary noise source in the Project area was vehicle traffic on Camino Del Mar, located to the east of the project site. Other secondary noise sounds included ocean wave noise, rustling leaves, birds (from a nearby veterinarian hospital), distant aircraft overflights, and other community noises. An active rail line also exists to the east of the project site (approximately 280 feet at the nearest point), east of Camino Del Mar. The results of the sound level measurements are summarized in Table 2, and measurement data and notes are provided in Appendix A. As shown in Table 2, measured noise levels ranged from 59 dBA L_{eq} at ST2 to 68 dBA L_{eq} at ST3 when rounded to whole numbers, as is customary for community noise measurements.

Table 2
Short-Term Sound Level Measurement Results

Site ID	Measurement Location	Measurement Period			Noise Sources	Measurement Results (dBA)					
		Date	*Start Time (a.m.)*	*Duration (minutes)*		L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}
ST1	Northeast of North Bluff Preserve. South of Project site.	10-30-17	12:14	15	traffic, birds, distant aircraft, distant gardener/ landscape noise	59.8	69.3	50.3	53.5	58.8	62.7
ST2	2722 Camino Del Mar Del Mar, California 92014	10-30-17	11:49	15	traffic, water hose, power drill, birds, distant aircraft, distant conversation.	58.7	68.9	48.1	50.6	56	62.7
ST3	160 Via de la Valle Solana Beach, California 92075	10-30-17	13:01	15	traffic, birds, distant aircraft, distant conversations/yelling, distant traffic	67.5	75.8	50	55.9	65.6	71.5
ST4	777 Highway 101 Solana Beach, California 92075	10-30-17	12:41	15	traffic, birds, distant aircraft, distant conversations/yelling, distant traffic	66.5	74.8	49.6	57.2	65.4	69.5

Source: Appendix A.
Notes: L_{eq} = equivalent continuous sound level (energy-averaged sound level); L_{max} = maximum sound level during the measurement interval; L_{min} = minimum sound level during the measurement interval; L_{90} = sound level exceeded for 90% of the measurement period; L_{50} = sound level exceeded for 50% of the measurement period; L_{10} = sound level exceeded for 10% of the measurement period.

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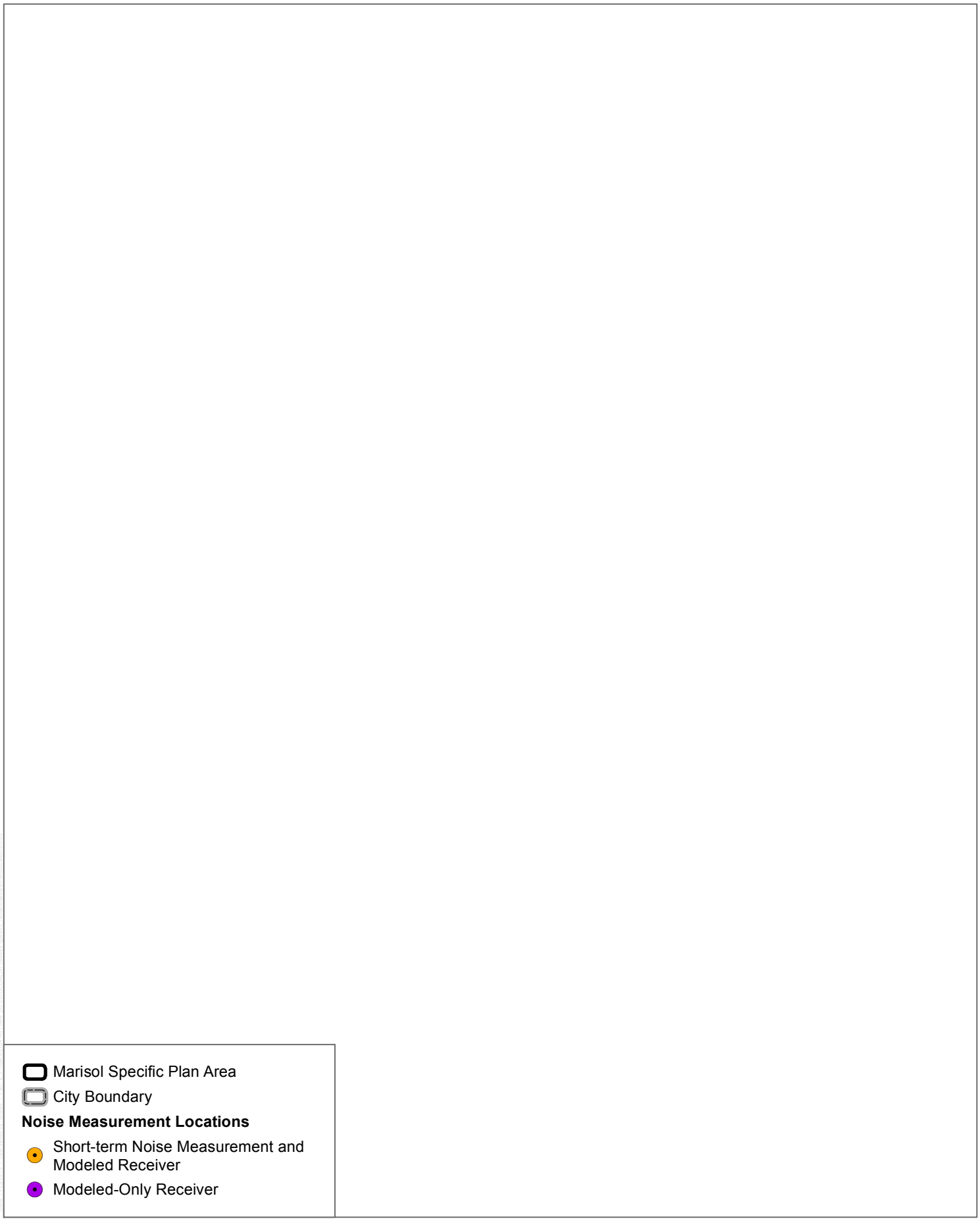

SOURCE: Bing Maps (Accessed 2017)

0 300 600 Feet

FIGURE 3

Noise Measurement and Off-Site Modeling Locations

Marisol Specific Plan Project Noise Technical Report

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3 REGULATORY SETTING

3.1 Federal

Noise Control Act

The Noise Control Act of 1972 recognized the role of the federal government in dealing with major commercial noise sources that require uniform treatment. Since Congress has the authority to regulate interstate and foreign commerce, regulation of noise generated by such commerce also falls under congressional authority. The federal government specifically preempts local control of noise from aircraft, railroads, and interstate highways. The U.S. Environmental Protection Agency has identified acceptable noise levels for various land uses to protect the public, with an adequate margin of safety, and to establish noise emissions standards for interstate commerce.

The Department of Housing and Urban Development's standards define day-night average sound levels (L_{dn}) at below 65 dBA for outdoors as acceptable for residential areas. Outdoor levels up to 75 dBA L_{dn} may be made acceptable through the use of insulation in buildings (HUD 2009).

3.2 State

California Code of Regulations, Title 24, Noise Insulation Standards

The pertinent California noise regulations are contained in the California Code of Regulations. Title 24, Noise Insulation Standards, establishes the acceptable interior environmental noise level for multifamily dwellings at 45 dBA L_{dn}. This may be extended by local legislative action to include single-family dwellings.

California Code of Regulations, Section 65302(f)

California Code of Regulations, Section 65302(f), requires local land use planning jurisdictions to prepare a general plan. The noise element is a mandatory component of the general plan. It may include general community noise guidelines developed by the California Department of Health Services and specific planning guidelines for noise/land use compatibility developed by the local jurisdiction. The state guidelines also recommend that the local jurisdiction consider adopting a local noise control ordinance. The California Department of Health Services developed guidelines (OPR 2003) for community noise acceptability for use by local agencies. Selected relevant levels are as follows (L_{dn} may be considered nearly equal to CNEL):

- CNEL below 60 dBA – normally acceptable for low-density residential use
- CNEL of 55 dBA to 70 dBA – conditionally acceptable for low-density residential use

- CNEL below 65 dBA – normally acceptable for high-density residential use
- CNEL of 60 dBA to 70 dBA – conditionally acceptable for high-density residential use, transient lodging, churches, and educational and medical facilities
- CNEL below 70 dBA – normally acceptable for playgrounds and neighborhood parks

"Normally acceptable" is defined as satisfactory for the specified land use, assuming that normal conventional construction is used in buildings. "Conditionally acceptable" may require some additional noise attenuation or special study. Under most of these land use categories, overlapping ranges of acceptability and unacceptability are presented, leaving some ambiguity in areas where noise levels fall within the overlapping range.

California Occupational Safety and Health Administration Occupational Noise Exposure Regulations

California additionally regulates noise emissions levels of licensed motor vehicles traveling on public thoroughfares, sets noise emissions limits for certain off-road vehicles and watercraft, and sets required sound levels for light-rail-transit vehicle warning signals.

The extensive state regulations pertaining to worker noise exposure are, for the most part, applicable only to the construction phase of any project,[1] or workers in a central plant and/or a maintenance facility or involved in the use of landscape maintenance equipment or heavy machinery.

3.3 Local

The Project is within the City; therefore, the City's noise standards are used for this analysis, and the relevant City noise regulations as they pertain to this project are summarized below. The City of Solana Beach is located immediately to the north. Thus, noise regulations for the City of Solana Beach are summarized below for informational purposes.

City of Del Mar

City of Del Mar Community Plan

The City goals for transportation noise sources are published in the Community Plan Transportation Element, Noise Section (March 1976, revised 2002). This section of the Community Plan identifies 65 dBA CNEL as the maximum noise level compatible with residential

[1] For example, the California Occupational Safety and Health Administration Occupational Noise Exposure Regulations (8 CCR, General Industrial Safety Orders, Article 105, Control of Noise Exposure, Section 5095, et seq.).

land uses. The Community Plan has no transportation noise source requirements applicable to compatibility with commercial and retail uses.

Objective D: Reduce the level of noise created by major transportation routes in the community.

Policy 1: Limit the speed of vehicular traffic along City streets, particularly Camino Del Mar.

Policy 2: Encourage sound reduction techniques in new buildings within the 65 decibel boundaries adjacent to Camino Del Mar and the railroad right-of-way (City of Del Mar 2002).

City of Del Mar Noise Ordinance

9.20.40 - Sound Level Limits.

A. Unless otherwise specified, it shall be unlawful for any person(s) to cause noise by any means to the extent that the one-hour average sound level exceeds the applicable limit given in the following table (shown here as Table 3) at any location in the City of Del Mar beyond the premises on which the noise is produced, as measured pursuant to the provisions of this Chapter. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said person(s).

Table 3
City of Del Mar Noise Ordinance Limits

Property Receiving Noise	Time of Day	One-Hour Average Sound Level (decibels)
1. R1-5, R1-5B, R1-10, R1-10B, R-2, R1-14, R1-40, RM-East, RM-West, RM-Central, RM-South, OS Overlay	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	50 40
2. NC, RC, CC, PC, BC, VC	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	60 50
3. RR	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	60 55

Source: City of Del Mar 1997.

B. The noise limits specified in Subsection A. above shall be adjusted as follows to account for the effects of time and duration on the impact of noise levels:

   a. Noise that is produced for no more than a cumulative period of 30 minutes in any hour may exceed the noise limit by three decibels.

   b. Noise that is produced for no more than a cumulative period of 15 minutes in any hour may exceed the noise limit by six decibels.

c. Noise that is produced for no more than a cumulative period of ten minutes in any hour may exceed the noise limit by eight decibels.

d. Noise that is produced for no more than a cumulative period of five minutes in any hour may exceed the noise limit by 11 decibels.

e. Noise that is produced for no more than a cumulative period of two minutes in any hour may exceed the noise limit by 15 decibels.

C. For purposes of this chapter, the peak decibel reading for a noise with a fluctuating noise level (such as live or recorded music) shall be considered as the noise level for the entire cumulative period of noise. Likewise, the time between repetitive intermittent noises (such as banging, pounding, or hammering) shall be included in the cumulative of the noise.

D. If the measured ambient level exceeds the applicable limit noted above, the allowable one-hour average sound level shall be the ambient noise level.

E. The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits of the two districts.

F. Fixed-location public utility distribution or transmission facilities located on or adjacent to a property line shall be subject to the noise level limits of this Chapter, measured at or beyond six feet from the boundary of the easement upon which the equipment is located.

9.20.050 Construction Noise. 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.

E. 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 (City of Del Mar 1997).

City of Solana Beach

City of Solana Beach General Plan

The Solana Beach General Plan Noise Element establishes noise criteria for various land uses (City of Solana Beach 1988). The Noise Element follows the state guidelines in State Government Code Section 653021(g) and the Health and Safety Code Section 46050.1. The Noise Element quantifies the community noise environment in terms of noise exposure contours for both near- and long-term levels of growth and traffic activity. The information will become a guideline for the development of land use policies to achieve compatible land uses and provide baseline levels and noise source identification for local noise ordinance enforcement. The maximum allowable exterior noise level at outdoor usable areas for new residential development is a CNEL of 65 dB. For residential development, the City typically applies the noise criteria at the backyards of single-family homes, and at private patios, exterior balconies, and exterior common use areas of multifamily developments. The interior noise standard is 45 dB CNEL. The Noise Element also articulates goals, objectives, and policies designed to facilitate appropriate land uses throughout the City. Noise Element policies applicable to the Project are outlined below.

Goal 3.1: To protect public health and welfare by eliminating existing noise problems and by preventing significant degradation of the future acoustic environment.

- **Policy 1.a:** The City shall adopt a standards by which identifies interior and exterior noise standards in relation to specific land uses, particularly "noise sensitive" areas such as residential areas, schools, hospitals, open space preserves, and parks. The ordinance shall specify the maximum allowable noise levels for transportation sources, construction activities, and other non-transportation sources such as industrial and commercial land uses.
- **Policy 1.b:** The adopted community noise standards shall be consistent with applicable state noise standards which specify that interior noise levels for residential living spaces shall not exceed 45 L_{dn}/CNEL. This standard shall be applied to all new single- and multi-family dwellings, hotels, and motels.
- **Policy 2.a:** The City shall require the construction of barriers to mitigate sound emissions where necessary and feasible.
- **Policy 4.a:** The City shall require that potential noise impacts be addressed for all projects as part of the initial study per CEQA to determine if unacceptable noise levels will be created or experienced. Depending on the level of impact, a noise impact evaluation may be required to be undertaken. Should noise abatement be

necessary, the City shall require the implementation of mitigation measures based on a detailed technical study prepared by a qualified acoustical engineer.

- **Policy 4.b:** The City shall not approve projects that do not comply with the standards established in the community noise ordinance concerning noise/land use compatibility unless all practical measures have been taken to mitigate potential noise impacts and the City Council adopts a "Statement of Overriding Considerations" which provides the rationale for approving such a project.

4 THRESHOLDS OF SIGNIFICANCE

California has guidelines to address the significance of noise impacts based on Appendix G of the California Environmental Quality Act Guidelines, which provides guidance that a project would have a significant environmental impact if it would do any of the following:

1. Result in the 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.
2. Result in generation of excessive groundborne vibration or groundborne noise levels.
3. 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, the project would expose people residing or working in the project area to excessive noise levels.

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5 IMPACTS AND MITIGATION

5.1 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

Implementation of the Project would result in two primary types of potential noise impacts: short-term (i.e., temporary) noise during construction and long-term noise during operation of the Project.

Short-Term Construction Noise

Project construction would generally involve the following sequence for all phases of the Project: (1) site preparation, (2) site grading, (3) building construction, (4) paving, and (5) architectural coatings. Although specific Project construction details and equipment fleet specifications are not available at this time, the following are typical types of construction equipment that would be expected:

- Backhoes
- Graders
- Loaders
- Compactors
- Cranes
- Excavators
- Trucks
- Pavers
- Pneumatic tools
- Generator sets
- Air compressors

As demonstrated by this list, construction equipment anticipated for the Project would include standard equipment that would be employed for any routine construction Project of this scale; construction equipment with substantially higher noise-generation characteristics (such as pile drivers, rock drills, blasting equipment) would not be necessary for the Project.

Construction noise is difficult to quantify because of the many variables involved, including the specific equipment types, size of equipment used, percentage of time in use, condition of each piece of equipment, and number of pieces of equipment that will actually operate on site at a time. The range of maximum noise levels for various types of construction equipment at a distance of 50 feet is depicted in Table 4. The noise values represent maximum noise generation, or full-power operation, of the equipment. As an example, a loader and two dozers, all operating at full power and relatively close together, would generate a maximum sound level of approximately 90 dBA at 50 feet from their operations. As distance increases between the equipment and/or distance increases between areas with simultaneous construction activity, dispersion and distance attenuation reduce the effects of separate noise sources added together. In addition, typical

operating cycles may involve 2 minutes of full-power operation, followed by 3 or 4 minutes at lower levels. The average noise level during construction activities is generally lower, since maximum noise generation may only occur up to 50% of the time.

Table 4
Construction Equipment Noise Emissions Levels

Equipment	Typical Sound Level (dBA) 50 Feet from Source
Backhoe	80
Air compressor	80
Generator	82
Compactor	80
Crane, mobile	85
Excavator	85
Grader	85
Loader	80
Paver	85
Pneumatic tool	85
Truck	84

Source: FHWA 2006.

The closest off-site existing sensitive receptors to construction of the Project are multifamily residences located approximately 30 feet to the north. Similarly, noise-sensitive receivers (single-family and multifamily residences adjacent to the two off-site water main alignment alternatives are located within approximately 30 feet from project-related construction. Most construction work would take place substantially further away, at distances of up to 1,000 feet away from the nearest residences.

The Federal Highway Administration's Roadway Construction Noise Model (RCNM) (FHWA 2008) was used to estimate construction noise levels. Input variables for RCNM consist of the receiver/land use types, the equipment type (e.g., backhoe, grader, scraper), the number of equipment pieces, the duty cycle for each piece of equipment (i.e., percentage of time the equipment typically works in a given time period), and the distance from the noise-sensitive receiver to the construction zone. The construction equipment (by phase) anticipated for development of the project was the same as used for the project's air quality impacts analysis (Dudek 2019), which was obtained using the California Air Resources Board California Emissions Estimator Model (CalEEMod). The RCNM has default duty cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty cycle values were utilized for this analysis. The RCNM model and the detailed results are provided in Appendix B.

Sensitive receptors near the Project site include residential uses to the north of the Project site. The results of the construction noise analysis are summarized in Table 5. As shown, the highest

noise levels from construction are predicted to range from approximately 67 dBA L_{eq} (during the demolition phase) to 87 dBA L_{eq} (during the pipeline site preparation) when construction takes place at or adjacent to the nearest noise-sensitive receivers. More typically, when construction would take place throughout the project site, construction noise levels would range from approximately 63 dBA L_{eq} (during the architectural coating phase) to 77 dBA L_{eq} (during the grading phase).

These noise levels would be higher than ambient noise levels in the area (as shown in Table 2) and would exceed the City's construction noise standard of 75 dBA L_{eq}. Therefore, construction noise impacts would be significant. To reduce construction noise impacts, MM-NOI-1 is required (see Section 5.5, Mitigation). Implementation of MM-NOI-1 would reduce construction-related noise impacts to a level that is **less than significant**. No additional mitigation is required for conventional construction activities.

Table 5.
Construction Noise Analysis Summary

Construction Phase	Construction Noise at Representative Receiver Distances (L_{eq} (dBA))	
	Nearest Source/Receiver Distance (Approx. 30 feet)[1]	*Typical Source/Receiver Distance (Approx. 170 feet)*[2]
Demolition	67	65
Site Preparation	84	75
Grading	85	77
Building Construction	81	74
Architectural Coating	74	63
Paving	82	73
Pipeline Site Preparation	87	69
Pipeline Installation / Backfill	83	67
Pipeline Paving	86	68

Source: Appendix B.
Note: L_{eq} = equivalent continuous sound level (time-averaged sound level); dBA = A-weighted decibel.
1 The exceptions are for the demolition phase, for which the nearest source/receiver distance is approximately 450 feet, and the building and architectural coating phase, for which the nearest source/reciver distance is approximately 40 feet.
2 The exceptions are for the demolition phase, for which the typical source/receiver distance is approximately 620 feet, and pipeline work, for which the nearest source/reciver distance is approximately 250 feet.

Long-Term Operational Noise Impact

Off-Site Traffic Noise Impacts. As a result of regional population growth and growth under the Project, traffic on local arterial streets is expected to increase relative to current conditions.

Potential noise effects from vehicular traffic were assessed using the Federal Highway Administration's Traffic Noise Model (TNM) Version 2.5 (FHWA 2004). Data used to model noise from vehicular traffic were derived from the Project-specific traffic impact analysis report prepared by Linscott, Law, and Greenspan (LLG 2019). Information used in the model included the Existing, Existing-plus-Project, Year 2035, and Year 2035-plus-Project traffic volumes. Noise levels were modeled at representative noise-sensitive receivers. The receivers were modeled to be 5 feet above the local ground elevation. Six receptors (ST1 through ST4, M1 and M2) represent existing off-site residences.

The information provided from this modeling, along with the results from ambient noise survey measurements, was compared to the noise impact significance criteria to assess whether Project-related traffic noise would cause a significant impact and, if so, where these impacts would occur. The results of the comparisons for the off-site noise-sensitive land uses are presented in Table 6. The input and output files for the TNM modeling are provided in Appendix C.

Table 6
Summary of Off-Site Existing and Future (Year 2035)
Unmitigated Traffic Noise Levels (dBA CNEL)

Modeled Receptor	Roadway Segment	Existing	Existing Plus Project	Future (Year 2035)	Future (Year 2035) Plus Project	Maximum Project-Related Noise Level Increase (dBA)
ST1 – Northeast of Preserve south of Project site	Camino Del Mar south of Via de la Valle	64	64	64	64	0
ST2 – Residences south of Project site	Camino Del Mar south of project site, north of 27th Street	62	63	63	63	1
ST3 – Residences east of Project site	Via de la Valle east of Camino Del Mar	69	69	69	70	1
ST4 – Residences north of Project site	Camino Del Mar north of Via de la Valle	67	67	69	69	0
M1 – Residences northeast of Project site	S. Sierra Avenue north of Border Avenue	57	57	58	58	0
M2 – Residences north of Project site	Border Avenue west of Camino Del Mar	61	61	62	62	0

Source: Appendix C.
Note: Project-related traffic noise levels are rounded to the nearest whole numbers.

As Table 6 shows, the Project would increase the noise level along these roads by a maximum of 1 dBA (when rounded to whole numbers) along the study area roads in the vicinity of the Project

site. For four of the six modeled off-site receivers, the predicted increase resulting from the Project would be 0 dB (i.e., tenths of a decibel which equate to zero when rounded to whole numbers). At receiver ST2, the Existing-Plus-Project noise level is predicted to increase 1 dB compared to the Existing scenario and at ST3, the Future-Plus-Project noise level is predicted to increase 1 dB compared to the Future (without Project) scenario. A change (either an increase or a decrease) of 1 dB is not an audible change in the context of community noise (i.e., outside of a controlled test environment). In addition, the Project would not cause noise levels to exceed applicable standards. The Project is not anticipated to result in significant traffic noise increases or cause an exceedance of applicable traffic noise standards. Therefore, the impact from traffic noise associated with the Project would be **less than significant**.

On-Site Mechanical, Recreational, and Parking Lot Noise. Mechanical HVAC equipment located on the ground or on rooftops of new buildings have the potential to generate high noise levels. The specific details (locations, sizes, manufacturers, and models) of the equipment have not yet been determined. The noise levels generated by HVAC equipment vary, but typically range from approximately 50 dBA to 65 dBA at a distance of 50 feet (City of Santa Ana 2010). For a single point source such as a piece of mechanical equipment, the sound level normally decreases by about 6 dBA for each doubling of distance from the source under "hard-surface" conditions typical of a developed commercial site. The HVAC noise levels have the potential to exceed the City noise standard for stationary source noise at residential uses (50 dBA L_{eq} from 7:00 a.m. to 10:00 p.m., 40 dBA L_{eq} from 10:00 p.m. to 7:00 a.m.) at the nearest existing noise-sensitive receptors. This is considered a potentially significant noise impact; a subsequent noise analysis will be required prior to final plan approval, in order to ensure that HVAC noise levels are in compliance with City noise standards. With the implementation of mitigation measure MM-NOI-2, mechanical noise would be less than significant with mitigation incorporated.

Recreational noise (i.e., noise from pool use or other activities such as special events) would take place within the resort grounds. Typically, up to approximately 20 guests would be anticipated to use the resort pool, up to approximately 10 guests would be anticipated to use the spa, and approximately 0 to 2 guests are anticipated to use the other on-site amenities at any one time. Noise from pool uses and other activities would be visually and acoustically shielded from the residential area to the north and other surrounding locations by the one to three-story-high resort buildings, as well as by the local terrain. However, without mitigation, impacts may be potentially significant. To ensure significant impacts related to recreational noise would not occur at residences to the north and other surrounding noise-sensitive locations, MM-NOI-3 limits usage for the pool and recreational areas to between the hours of 7:00 a.m. and 10:00 p.m., and amplified music would not be permitted outside of those hours. Additionally, MM-NOI-3 requires that policies and procedures be implemented to ensure that

noise levels from the Project in the surrounding areas are minimized. This may include signage on site requesting that visitors and guests be aware and respectful of the surrounding environment and refrain from excessive noise-making. With implementation of MM-NOI-3, recreational noise would be **less than significant**.

Parking for the Project would be accommodated by construction of an underground parking structure. Access to the proposed parking structure would be via Border Avenue to the north of the site at the intersection of Border Avenue and S. Sierra Avenue. Noise sources from parking lots and structures include car alarms, door slams, radios, and tire squeals. These sources typically range from about 30 dBA to 66 dBA at a distance of 100 feet (Gordon Bricken & Associates 1996) and are generally short-term and intermittent. Parking structures have the potential to generate instantaneous noise levels that exceed 60 dBA depending on the location of the source; however, noise sources from the parking structure would be different from each other in kind, duration, and location, so that the overall effects would be separate and in most cases would not affect noise-sensitive receptors at the same time. Furthermore, the proposed parking structure would be underground, and the entrances to the parking structure would be shielded from a direct view of residences to the north by intervening resort buildings. Therefore, noise impacts from parking structure noise would be **less than significant**.

On-Site Exterior Traffic Noise Impacts. The evaluation of potential noise effects on noise-sensitive receivers created by a project (in this instance, resort visitors and guests) is not required under the California Environmental Quality Act. The following information is therefore provided for informational purposes. Potential noise effects at proposed on-site noise-sensitive locations from vehicular traffic were assessed using the FHWA's TNM Version 2.5 (FHWA 2004). A total of 32 receptors (M3–M34) representing the exterior walls of resort rooms with potential traffic noise exposure and outdoor recreation or relaxation areas were modeled, as shown in Figure 4, Modeled On-Site Receivers.

Additionally, potential on-site noise effects from the adjacent rail line were assessed using the Federal Rail Administration (FRA) CREATE rail noise model (Harris, Miller, Miller and Hansen 2006). The input parameters for the rail noise model impacts analysis were based upon the assumptions used for the analysis of the planned San Dieguito River Bridge Replacement, Double Track, and Del Mar Fairgrounds Special Events Platform Environmental Assessment (SANDAG 2014). Year 2030 (the worst-case) passenger and freight train operations were assessed for the project, in which a total of 71 daytime (7:00 a.m. to 10:00 p.m.) and 19 nighttime (10:00 p.m. to 7:00 a.m.) passenger rail operations per day would occur, and a total of 11 nighttime freight rail operations would occur. The other rail noise modeling parameters (as part of the input/output model spreadsheets) are provided in Appendix D. Based upon the results of the rail noise modeling, noise from the rail line located to the east of Camino Del Mar would range from approximately 57 dBA L_{dn} to 64 dBA L_{dn}/CNEL at on-site building facades with an exposure of the rail line.

The results for the proposed on-site noise-sensitive land uses are presented in Table 7.

Table 7
Summary of On-Site Future (Year 2035) plus Project Unmitigated Traffic Noise Levels (dBA CNEL)

Modeled Receiver # - Description	Floor Level		
	1st Level	*2nd Level*	*3rd Level*
M3 – Low cost visitor serving	59	62	n/a
M4 – Low cost visitor serving	64	65	n/a
M5 – Low cost visitor serving	60	62	n/a
M6 – Affordable housing	60	62	n/a
M7 – Affordable housing	54	62	n/a
M8 – Affordable housing	51	59	n/a
M9 – Ballroom	49	54	n/a
M10 – Event/Meeting	57	62	62
M11 – Suite	53	57	59
M12 – Specialty restaurant	51	57	57
M13 – Reception/lobby	50	56	56
M14 – Reception/lobby	49	55	n/a
M15 – Bar/lounge	50	53	n/a
M16 – Open area	49	n/a	n/a
M17 – Hotel pool	49	n/a	n/a
M18 – Open area	35	n/a	n/a
M19 – Villa	49	51	52
M20 – Villa pool	38	n/a	n/a
M21 – Villa	51	51	52
M22 – Villa pool	40	n/a	n/a
M23 – Villa	53	55	57
M24 – Villa pool	45	n/a	n/a
M25 – Villa pool	38	n/a	n/a
M26 – Villa pool	30	n/a	n/a
M27 – - Villa pool	36	n/a	n/a
M28 - Villa pool	39	n/a	n/a
M29- Villa pool	41	n/a	n/a
M30- Villa pool	32	n/a	n/a
M31 - Villa	57	58	59
M32 - Villa	55	57	57
M33- Villa pool	47	n/a	n/a
M34- Villa pool	45	n/a	n/a

Source: Appendix C.
Notes:
n/a – Not applicable. No noise-sensitive receiver exists at this level.

Additionally, potential on-site noise effects from the adjacent rail line were assessed using the Federal Rail Administration (FRA) CREATE rail noise model (spreadsheet by Harris, Miller, Miller and Hansen, 2006). The input parameters for the rail noise model impacts analysis were based upon the assumptions used for the analysis of the planned San Dieguito River Bridge

Replacement, Double Track, and Del Mar Fairgrounds Special Events Platform Environmental Assessment (SANDAG 2014). Year 2030 (the worst-case) passenger and freight train operations were assessed for the project, in which a total of 71 daytime (7:00 a.m. to 10:00 p.m.) and 19 nighttime (10:00 p.m. to 7:00 a.m.) passenger rail operations per day would occur, and a total of 11 nighttime freight rail operations would occur. The other rail noise modeling parameters (as part of the input/output model spreadsheets) are provided in Appendix D. Based upon the results of the rail noise modeling, noise from the rail line located to the east of Camino Del Mar would range from approximately 57 dBA L_{dn} to 64 dBA L_{dn}/CNEL at on-site building facades with an exposure of the rail line. The combined (traffic plus rail noise) results for the proposed on-site noise-sensitive land uses are presented in Table 8.

Table 8
Summary of On-Site Future plus Project Unmitigated Traffic plus Rail Noise Levels (dBA CNEL)

Modeled Receiver # - Description	Floor Level		
	1st Level	*2nd Level*	*3rd Level*
M3 – Low cost visitor serving	**63**	**64**	n/a
M4 – Low cost visitor serving	**66**	**67**	n/a
M5 – Low cost visitor serving	**65**	**66**	n/a
M6 – Affordable housing	**65**	**66**	n/a
M7 – Affordable housing	**63**	**65**	n/a
M8 – Affordable housing	**64**	**65**	n/a
M9 – Ballroom	**64**	**64**	n/a
M10 – Event/Meeting	**62**	**64**	**64**
M11 – Suite	60	**61**	**62**
M12 – Specialty restaurant	60	**61**	**61**
M13 – Reception/lobby	60	**61**	**61**
M14 – Reception/lobby	59	60	n/a
M15 – Bar/lounge	59	60	n/a
M16 – Open area	57	n/a	n/a
M17 – Hotel pool	57	n/a	n/a
M18 – Open area	35	n/a	n/a
M19 – Villa	49	51	n/a
M20 – Villa pool	38	n/a	n/a
M21 – Villa	51	51	52
M22 – Villa pool	40	n/a	n/a
M23 – Villa	53	55	57
M24 – Villa pool	45	n/a	n/a
M25 – Villa pool	38	n/a	n/a
M26 – Villa pool	30	n/a	n/a
M27 – Villa pool	36	n/a	n/a
M28 – Villa pool	39	n/a	n/a
M29 – Villa pool	41	n/a	n/a

Table 8
Summary of On-Site Future plus Project Unmitigated Traffic plus Rail Noise Levels (dBA CNEL)

Modeled Receiver # - Description	Floor Level		
	1st Level	*2nd Level*	*3rd Level*
M30 – Villa pool	32	n/a	n/a
M31 – Villa	57	58	59
M32 – Villa	55	57	57
M33 – Villa pool	47	n/a	n/a
M34 – Villa pool	45	n/a	n/a

Source: Appendices C and D.
Notes:
n/a – Not applicable. No noise-sensitive receiver exists at this level.
Shaded numbers represent receiver locations exceeding 65 dBA CNEL; these locations will require noise barriers to comply with the 65 dBA CNEL noise standard for outdoor areas.
Bolded numbers represent interior receiver locations exceeding 60 dBA CNEL; these guest rooms will require subsequent interior noise analysis to verify compliance with the 45 dBA CNEL/L_{dn} noise standard for habitable rooms.

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SOURCE: Dudek 2019

FIGURE 4

Modeled On-Site Receivers

DUDEK

Marisol Specific Plan Project Noise Technical Report

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As shown in Table 8, the results of the noise modeling indicate that on-site noise levels would range from approximately 30 dBA CNEL (at receiver M26) to 67 dBA CNEL (at receiver M4). At representative receivers M4, 5, and 6, traffic noise levels combined with train noise would exceed the City's exterior noise compatibility standard of 65 dBA CNEL. At these receivers, which represent the façades in the resort's northeastern corner, facing the rail line, the noise levels would range from approximately 66 dBA CNEL to approximately 67 dBA CNEL. If usable private outdoor areas are constructed along the northern, eastern or southern façades (i.e., patios or balconies), noise-attenuating barriers would be required at these locations to comply with the City's exterior noise standard of 65 dBA CNEL. In order to achieve the desired noise reduction (a minimum of 1 dB to 2 dB reduction), that noise barriers with a minimum height of 5 feet may be constructed along the length of the patio or balcony area. The noise barriers could be constructed of a material such as tempered glass, acrylic glass (or similar material), masonry material, or manufactured lumber (or a combination of these) with a surface density of at least three pounds per square foot. The noise barriers should have no openings or cracks. Because analysis of impacts at on-site noise-sensitive receivers created by the project are not required as part of the CEQA analysis, this recommendation is advisory in nature.

On-Site Interior Traffic Noise Impacts.

The City and the state require that interior noise levels not exceed a CNEL or L_{dn} of 45 dBA within the habitable rooms of residences, including transient residential lodging. Typically, with the windows open, building shells provide approximately 15 dB of noise reduction. Therefore, rooms exposed to an exterior CNEL greater than 60 dBA could result in an interior CNEL greater than 45 dB. The State Building Code recognizes this relationship, and therefore, requires interior noise studies when the exterior noise level is projected to exceed 60 dBA L_{dn} (or CNEL).

The data shown in Table 8 indicate that modeled exterior traffic noise levels would exceed 60 dBA CNEL at receivers M3 through 13, all of which represent easterly-facing (i.e., northeast, southeast, or east) building façades with a direct exposure of Camino Del Mar. Thus, the unmitigated interior noise level within the habitable rooms of these dwelling units could exceed the 45 dBA CNEL noise criterion. Thus, a subsequent interior noise analysis is recommended for these units in order to ensure that the resultant noise levels meet the state and City interior noise standard. Because analysis of impacts at on-site noise-sensitive receivers created by the project are not required as part of the CEQA analysis, this recommendation is advisory in nature.

5.2 Excessive Groundborne Vibration or Groundborne Noise Levels

Groundborne vibration is a small, rapidly fluctuating motion transmitted through the ground that diminishes (attenuates) fairly rapidly over distance. Anticipated groundborne vibration from heavy

equipment operations during construction of the Project was evaluated and compared to relevant vibration impact criteria using the FTA's Transit Noise and Vibration Impact Assessment manual, which provides vibration impact criteria and recommended methodologies and guidance for assessment of vibration effects (FTA 2018).

At a distance of approximately 30 feet, the vibration level from heavy construction machinery (such as a large bulldozer) would be approximately 0.068 peak particle velocity in inches per second (PPV IPS). Vibration levels of this magnitude would likely be perceptible at nearby residences, but they would be below the FTA's threshold of potential damage for normal structures (0.20 PPV IPS) and would not be considered excessive. Additionally, the great majority of the construction work would take place at distances substantially further than 30 feet away and would not be perceptible. Therefore, short-term construction-related vibration impacts would be **less than significant**.

On-site vibration levels from the rail line located to the east of the project site were also evaluated. Based the upon the methodology for FTA's Transit Noise and Vibration Impact Assessment manual, the vibration level from a diesel-powered locomotive (passenger or freight) would be approximately 68 VdB (velocity decibels) traveling 50 miles per hour at a distance of 280 feet (the nearest distance from the project site to the rail line). Adjusting for an estimated passenger train speed of 70 miles per hour, the resulting vibration level would be approximately 70.9 VdB, which is below the FTA threshold for acceptable groundborne vibration for residential uses of 72 VdB. Therefore, on-site vibration impacts from rail noise would be **less than significant**.

5.3 Private Airstrip or Airport

The nearest private airstrip to the Project site is the Lyall-Roberts Airport located at Lyall Roberts Orchards, 15524 Highway 76 in Escondido, California, approximately 28 miles from the Project site. The Project would not expose people residing or working in the Project area to excessive noise levels associated with any airstrip and would therefore result in **no impact**.

The closest airport to the Project site is McClellan-Palomar Airport, located at 2192 Palomar Airport Road in Carlsbad, California, more than 10 miles north of the Project site. The Project would not be located within 2 miles of any airport and would not expose people residing or working in the Project area to excessive noise levels associated with an airport. Therefore, the Project would result in **no impact** related to airports.

5.4 Cumulative Impacts

Construction noise impacts primarily affect the areas immediately adjacent to a construction site. Temporary construction activities are likely to include only standard construction equipment; no pile driving or blasting activities are expected. Additionally, the Project would comply with the

City's Noise Control Ordinance related to construction activities (Monday through Friday, 7:00 a.m. to 7:00 p.m., and Saturday, 9:00 a.m. to 7:00 p.m.; no construction activities on Sunday or during federal holidays) (City of Del Mar 1997). Thus, although several construction activities may occur simultaneously in the surrounding community, given the distance between the Project site and the cumulative projects within the City, and given the projects' compliance with local jurisdictional noise standards, it is unlikely that the noise increase would exceed 3 dB (the minimum change in the sound level of individual events that an average human ear can detect). Additionally, MM-NOI-1 is required to reduce construction noise and would minimize construction noise impacts associated with the Project to a less-than-significant level. Therefore, the increased noise **would not result in significant cumulative impacts**.

The future (Year 2035) traffic volumes used for the analysis of traffic noise include cumulative growth. As shown in Table 6, the Project's traffic-related impacts would not result in a significant noise level increase along adjacent roadways. Additionally, the project would not result in an increase in rail-related noise or vibration (i.e., would not result in increased rail trips or otherwise cause rail noise or vibration to increase at noise-sensitive land uses. Therefore, impacts would not be cumulatively considerable and would be **less than significant**.

5.5 Mitigation

MM-NOI-1 Prior to initiation of Project construction, the City of Del Mar shall approve a construction noise mitigation program to include the following in order to ensure that the City of Del Mar construction noise standard (75 dBA L_{eq} 1-hr) is not exceeded:

- Temporary sound barriers/shielding shall be installed to shield non-mobile equipment in the vicinity of nearby residences, or, alternatively, to shield at the site's boundaries. For example, for on-site construction activities, an 8-foot-high noise barrier would be constructed along the Project's northern site boundary. For noisy pipeline construction activities near residential land uses, a portable noise barrier that would break the line of sight between the construction activity (to the extent practical) and the residences would be used. The material for a temporary noise barrier could consist of such materials as 3/4-inch thick plywood or portable barriers with a minimum sound transmission class rating of 20.
- Construction equipment shall be properly outfitted and maintained with feasible noise-reduction devices (e.g., functioning mufflers and silencers, tightly closed access panels) to minimize construction-generated noise.
- Stationary noise sources such as generators or pumps shall be located as far away from noise-sensitive land uses as feasible.

- Laydown and construction vehicle staging areas shall be located away from noise-sensitive land uses if feasible.
- Whenever possible, residential areas that will be subject to construction noise shall be informed one (1) week before the start of each construction phase.

MM-NOI-2 Because heating, ventilation, and air conditioning (HVAC) equipment and other mechanical equipment can generate noise that could affect surrounding sensitive receptors and because the details, specifications, and locations of this equipment is not yet known, the Project applicant shall retain an acoustical specialist to review project construction-level plans to ensure that the equipment specifications and plans for HVAC and other outdoor mechanical equipment incorporate measures, such as the specification of quieter equipment or provision of acoustical enclosures, that will not exceed relevant noise standards (50 dBA L_{eq} daytime, 40 dBA L_{eq} nighttime) at nearby noise-sensitive land uses (e.g., residential). Prior to the commencement of construction, the acoustical specialist shall certify in writing to the City that the equipment specifications and plans incorporate measures that will achieve the relevant noise limits.

MM-NOI-3 Policies and procedures shall be implemented to ensure that noise levels from the project in the surrounding areas are minimized. Such policies may include signage requesting that visitors and guests be aware and respectful of the surrounding environment and refrain from excessive noise-making. Usage of the on-site pool and other recreational areas shall be limited to the hours between 7:00 a.m. and 10:00 p.m. Additionally, amplified music shall be limited to the hours between 7:00 a.m. and 10:00 p.m. Enforcement of these limitations shall be carried out by resort staff and management, and through the posting of signs.

6 SUMMARY AND CONCLUSIONS

This noise analysis evaluates the potential for significant adverse impacts due to Project construction and operation. Implementation of the Project would result in two primary types of potential noise impacts: short-term (i.e., temporary) noise during construction and long-term noise during operation of the Project.

Noise from construction would exceed the 75 dB construction noise standard established in the City's Noise Control Ordinance; therefore, impacts would be significant. To reduce construction noise impacts, MM-NOI-1 is required. Implementation of MM-NOI-1 would reduce construction-related noise impacts to a level that is **less than significant**. The Project's traffic-related impacts would not result in a noise level increase along adjacent roadways; therefore, traffic noise impacts would be **less than significant** at off-site land uses. On-site mechanical equipment (such as HVAC equipment) has the potential to result in noise levels in excess of City noise standards; implementation of mitigation measure MM-NOI-2 would ensure that noise from mechanical equipment does not exceed applicable noise standards. Mitigation measure MM-NOI-3 would specify limits on hours for pool and other recreational area usage, as well as the use of amplified music, to ensure that noise from hotel guests and activities is less than significant. Vibration levels associated with Project construction would likely be perceptible at nearby residences, but they would be below the FTA's threshold of potential damage for normal structures (0.20 PPV IPS) and would not be considered excessive; therefore, impacts would be **less than significant**. The Project is not located within the vicinity of an airport or private airstrip and would not expose people residing or working in the Project area to excessive noise levels associated with a private airstrip; thus, there would be no impact. Finally, the analysis concluded that the Project would not result in any significant cumulative impacts.

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8 LIST OF PREPARERS

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APPENDIX A

Field Noise Measurement Data

DUDEK
CREATOR OF KERATA TECHNOLOGY

FIELD DATA REPORT

Field Noise Measurement Data

Record: 800	
Project Name	*Del Mar*
Observer(s)	*Connor Burke*
Date	*2017-10-30*
autoemail	*cburke@dudek.com*

Meteorological Conditions	
Temp (F)	*65*
Humidity % (R.H.)	*75*
Wind	*Calm*
Wind Speed (MPH)	*3*
Wind Direction	*East*
Sky	*Overcast*

Instrument and Calibrator Information	
Instrument Name List	*(ENC) Rion NL-52*
Instrument Name	*(ENC) Rion NL-52*
Instrument Name Lookup Key	*(ENC) Rion NL-52*
Manufacturer	*Rion*
Model	*NL-52*
Serial Number	*553896*
Calibrator Name	*(ENC) LD CAL150*
Calibrator Name	*(ENC) LD CAL150*
Calibrator Name Lookup Key	*(ENC) LD CAL150*
Calibrator Manufacturer	*Larson Davis*
Calibrator Model	*LD CAL150*
Calibrator Serial #	*5152*
Pre-Test (dBA SPL)	*94*
Post-Test (dBA SPL)	*94*
Windscreen	*Yes*
Weighting?	*A-WTD*
Slow/Fast?	*Slow*
ANSI?	*Yes*

Recordings	
Record #	*1*
Site ID	*ST3*
Site Location	*Latitude:32.971390, Longitude:-117.268503, Altitude:6.983555, Speed:0.000000, Horizontal Accuracy:5.000000, Vertical Accuracy:4.000000, Time:11:49:37 AM PDT*
Begin (Time)	*11:49:00*
End (Time)	*11:59:00*
Leq	*58.7*
Lmax	*68.9*
Lmin	*48.1*
Other Lx?	*L90, L50, L10*
L90	*50.6*
L50	*56*
L10	*62.7*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Conversations / Yelling, Distant Traffic*

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Other Noise Sources Additional Description	*Water hose. Powerdrill*
Is the same instrument and calibrator being used as previously notated?	*Yes*
Are the meteorological conditions the same as previously notated?	*Yes*

Source Info and Traffic Counts	
Distance to Roadway (feet)	*35*
Distance to Roadway - Centerline/Edge of Pavement	*Centerline*
Estimated Vehicle Speed (MPH)	*30*
Count Duration (Min)	*10*
Posted Speed Limit Sign (MPH)	*25*

Traffic Counts	
Counting Both Directions?	*Yes*
Autos	*1*
Number of Vehicles - Autos	*118*
Medium Trucks	*1*
Number of Vehicles - Medium Trucks	*2*
Heavy Trucks	*1*
Number of Vehicles - Heavy Trucks	*1*
Motorcyles	*1*
Number of Vehicles - Motorcyles	*1*

Description / Photos

Site Photos

Photo

Comments / Description	*Facing east.*

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Recordings	
Record #	*2*
Site ID	*ST1*
Site Location	*Latitude:32.978135, Longitude:-117.269673, Altitude:30.687717, Speed:0.000000, Horizontal Accuracy:5.000000, Vertical Accuracy:4.000000, Time:12:14:51 PM PDT*
Begin (Time)	*12:14:00*
End (Time)	*12:24:00*
Leq	*59.8*
Lmax	*69.3*
Lmin	*50.3*
Other Lx?	*L90, L50, L10*
L90	*53.5*
L50	*58.8*
L10	*62.7*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Conversations / Yelling, Distant Traffic*
Other Noise Sources Additional Description	*Sprinklers*
Is the same instrument and calibrator being used as previously notated?	*Yes*
Are the meteorological conditions the same as previously notated?	*Yes*

Source Info and Traffic Counts	
Distance to Roadway (feet)	*200*
Distance to Roadway - Centerline/Edge of Pavement	*Centerline*
Estimated Vehicle Speed (MPH)	*25*
Count Duration (Min)	*10*

Traffic Counts	
Counting Both Directions?	*Yes*
Autos	*1*
Number of Vehicles - Autos	*152*
Medium Trucks	*1*
Number of Vehicles - Medium Trucks	*1*
Motorcyles	*1*
Number of Vehicles - Motorcyles	*1*

Description / Photos

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Site Photos	
Photo	
Comments / Description	*Facing east.*

Recordings	
Record #	*3*
Site ID	*ST5*
Site Location	*Latitude:32.981324, Longitude:-117.269401, Altitude:22.022373, Speed:0.000000, Horizontal Accuracy:5.000000, Vertical Accuracy:3.000000, Time:12:40:58 PM PDT*
Begin (Time)	*12:41:00*
End (Time)	*12:51:00*
Leq	*66.5*
Lmax	*74.8*
Lmin	*49.6*
Other Lx?	*L90, L50, L10*
L90	*57.2*
L50	*65.4*
L10	*69.5*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Conversations / Yelling, Distant Gardener / Landscape Noise, Distant Traffic, Rustling Leaves*
Other Noise Sources Additional Description	*Crows circling were very audible*
Is the same instrument and calibrator being used as previously notated?	*Yes*
Are the meteorological conditions the same as previously notated?	*Yes*

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Source Info and Traffic Counts	
Distance to Roadway (feet)	*40*
Distance to Roadway - Centerline/Edge of Pavement	*Centerline*
Estimated Vehicle Speed (MPH)	*40*
Count Duration (Min)	*10*

Traffic Counts	
Counting Both Directions?	*Yes*
Autos	*1*
Number of Vehicles - Autos	*157*
Medium Trucks	*1*
Number of Vehicles - Medium Trucks	*1*
Buses	*1*
Number of Vehicles - Buses	*1*

Description / Photos

Site Photos

Photo

Comments / Description	*Facing east.*

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DUDEK
CREATOR OF KERATA TECHNOLOGY

FIELD DATA REPORT

Recordings	
Record #	*4*
Site ID	*ST4*
Site Location	*Latitude:32.980417, Longitude:-117.266258, Altitude:20.037144, Speed:0.000000, Horizontal Accuracy:5.000000, Vertical Accuracy:4.000000, Time:1:01:32 PM PDT*
Begin (Time)	*13:01:00*
End (Time)	*13:11:00*
Leq	*67.5*
Lmax	*75.8*
Lmin	*50*
Other Lx?	*L90, L50, L10*
L90	*55.9*
L50	*65.6*
L10	*71.5*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Gardener / Landscape Noise, Distant Traffic*
Is the same instrument and calibrator being used as previously notated?	*Yes*
Are the meteorological conditions the same as previously notated?	*Yes*

Source Info and Traffic Counts	
Distance to Roadway (feet)	*30*
Distance to Roadway - Centerline/Edge of Pavement	*Centerline*
Estimated Vehicle Speed (MPH)	*40*
Count Duration (Min)	*10*

Traffic Counts	
Counting Both Directions?	*Yes*
Autos	*1*
Number of Vehicles - Autos	*157*
Medium Trucks	*1*
Number of Vehicles - Medium Trucks	*3*
Buses	*1*

Description / Photos

Site Photos

powered by ZerionSoftware

Photo	
Comments / Description	*Facing south.*

powered by ZerionSoftware

APPENDIX B

Construction Noise Modeling
Input/Output Files

Report date: 10/23/2019
Case Description: Marisol SP - Del Mar - Demolition

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential - North - Closest	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	450	0
Excavator	No	40		80.7	450	0
Excavator	No	40		80.7	550	0
Excavator	No	40		80.7	550	0
Dozer	No	40		81.7	500	0
Dozer	No	40		81.7	650	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Day Lmax	Noise Limits (dBA) Leq	Evening Lmax	Leq
Concrete Saw	70.5	63.5	N/A	N/A	N/A	N/A
Excavator	61.6	57.6	N/A	N/A	N/A	N/A
Excavator	59.9	55.9	N/A	N/A	N/A	N/A
Excavator	59.9	55.9	N/A	N/A	N/A	N/A
Dozer	61.7	57.7	N/A	N/A	N/A	N/A
Dozer	59.4	55.4	N/A	N/A	N/A	N/A
Total	70.5	66.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential - North - Typical	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	620	0
Excavator	No	40		80.7	620	0
Excavator	No	40		80.7	620	0
Excavator	No	40		80.7	620	0
Dozer	No	40		81.7	620	0
Dozer	No	40		81.7	620	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Day Lmax	Noise Limits (dBA) Leq	Evening Lmax	Leq
Concrete Saw	67.7	60.7	N/A	N/A	N/A	N/A
Excavator	58.8	54.9	N/A	N/A	N/A	N/A
Excavator	58.8	54.9	N/A	N/A	N/A	N/A
Excavator	58.8	54.9	N/A	N/A	N/A	N/A
Dozer	59.8	55.8	N/A	N/A	N/A	N/A

Dozer		59.8	55.8	N/A	N/A	N/A	N/A
	Total	67.7	64.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/28/2019
Case Description: Marisol SP - Del Mar - Site Prep

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential - North - Closest	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	30	0
Dozer	No	40		81.7	75	0
Dozer	No	40		81.7	150	0
Backhoe	No	40		77.6	50	0
Front End Loader	No	40		79.1	100	0
Tractor	No	40	84		200	0

		Calculated (dBA)		Results Noise Limits (dBA) Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		86.1	82.1	N/A	N/A	N/A	N/A
Dozer		78.1	74.2	N/A	N/A	N/A	N/A
Dozer		72.1	68.1	N/A	N/A	N/A	N/A
Backhoe		77.6	73.6	N/A	N/A	N/A	N/A
Front End Loader		73.1	69.1	N/A	N/A	N/A	N/A
Tractor		72	68	N/A	N/A	N/A	N/A
	Total	86.1	83.7	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential - North - Typical	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	170	0
Dozer	No	40		81.7	170	0
Dozer	No	40		81.7	170	0
Backhoe	No	40		77.6	170	0
Front End Loader	No	40		79.1	170	0
Tractor	No	40	84		170	0

	Calculated (dBA)		Results Noise Limits (dBA) Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq

Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		71	67.1	N/A	N/A	N/A	N/A
Dozer		71	67.1	N/A	N/A	N/A	N/A
Dozer		71	67.1	N/A	N/A	N/A	N/A
Backhoe		66.9	63	N/A	N/A	N/A	N/A
Front End Loader		68.5	64.5	N/A	N/A	N/A	N/A
Tractor		73.4	69.4	N/A	N/A	N/A	N/A
	Total	73.4	74.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Report date: 10/23/2019
Case Description: Marisol SP - Del Mar - Pipeline Site Prep

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential - Closest	Residential	60	55	50

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Concrete Saw	No	20		89.6	30	0

		Results			
	Calculated (dBA)		Noise Limits (dBA)		
		Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	94	87	N/A	N/A	N/A	N/A
Total	94	87	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential - Typical	Residential	60	55	50

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Concrete Saw	No	20		89.6	250	0

		Results			
	Calculated (dBA)		Noise Limits (dBA)		
		Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	75.6	68.6	N/A	N/A	N/A	N/A
Total	75.6	68.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Report date: 10/28/2019
Case Description: Marisol SP - Del Mar - Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential - North - Closest	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	30	0
Excavator	No	40		80.7	75	0
Grader	No	40	85		50	0
Dozer	No	40		81.7	100	0
Scraper	No	40		83.6	150	0
Scraper	No	40		83.6	200	0
Backhoe	No	40		77.6	75	0
Tractor	No	40	84		200	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Excavator	85.1	81.2	N/A	N/A	N/A	N/A
Excavator	77.2	73.2	N/A	N/A	N/A	N/A
Grader	85	81	N/A	N/A	N/A	N/A
Dozer	75.6	71.7	N/A	N/A	N/A	N/A
Scraper	74	70.1	N/A	N/A	N/A	N/A
Scraper	71.5	67.6	N/A	N/A	N/A	N/A
Backhoe	74	70.1	N/A	N/A	N/A	N/A
Tractor	72	68	N/A	N/A	N/A	N/A
Total	85.1	85.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential - North - Typical	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	170	0
Excavator	No	40		80.7	170	0
Grader	No	40	85		170	0
Dozer	No	40		81.7	170	0
Scraper	No	40		83.6	170	0
Scraper	No	40		83.6	170	0
Backhoe	No	40		77.6	170	0
Tractor	No	40	84		170	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Excavator	70.1	66.1	N/A	N/A	N/A	N/A

Excavator		70.1	66.1	N/A	N/A	N/A	N/A
Grader		74.4	70.4	N/A	N/A	N/A	N/A
Dozer		71	67.1	N/A	N/A	N/A	N/A
Scraper		73	69	N/A	N/A	N/A	N/A
Scraper		73	69	N/A	N/A	N/A	N/A
Backhoe		66.9	63	N/A	N/A	N/A	N/A
Tractor		73.4	69.4	N/A	N/A	N/A	N/A
	Total	74.4	77	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/23/2019
Case Description: Marisol SP - Del Mar - Pipeline Installation / Backfill

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential - Closest	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	30	0
Generator	No	50		80.6	75	0
Backhoe	No	40		77.6	50	0

	Calculated (dBA)		Results Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	85.1	81.2	N/A	N/A	N/A	N/A
Generator	77.1	74.1	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A
Total	85.1	82.5	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential - Typical	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	250	0
Generator	No	50		80.6	250	0
Backhoe	No	40		77.6	250	0

	Calculated (dBA)		Results Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	66.7	62.8	N/A	N/A	N/A	N/A
Generator	66.7	63.6	N/A	N/A	N/A	N/A

Backhoe		63.6	59.6	N/A	N/A	N/A	N/A
	Total	66.7	67.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/23/2019
Case Description: Marisol SP - Del Mar - Pipeline Paving

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential - Closest	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		30	0
Paver	No	50		77.2	75	0
Roller	No	20		80	50	0

	Calculated (dBA)		Results Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	89.4	85.5	N/A	N/A	N/A	N/A
Paver	73.7	70.7	N/A	N/A	N/A	N/A
Roller	80	73	N/A	N/A	N/A	N/A
Total	89.4	85.8	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential - Typical	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		250	0
Paver	No	50		77.2	250	0
Roller	No	20		80	250	0

	Calculated (dBA)		Results Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	71	67	N/A	N/A	N/A	N/A
Paver	63.2	60.2	N/A	N/A	N/A	N/A
Roller	66	59	N/A	N/A	N/A	N/A
Total	71	68.4	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Report date: 10/28/2019
Case Description: Marisol SP - Del Mar - Bldg Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential - North - Closest	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	40	0
Man Lift	No	20		74.7	75	0
Man Lift	No	20		74.7	50	0
Man Lift	No	20		74.7	100	0
Generator	No	50		80.6	50	0
Backhoe	No	40		77.6	150	0
Front End Loader	No	40		79.1	75	0
Tractor	No	40	84		200	0
Welder / Torch	No	40		74	75	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Crane	82.5	74.5	N/A	N/A	N/A	N/A
Man Lift	71.2	64.2	N/A	N/A	N/A	N/A
Man Lift	74.7	67.7	N/A	N/A	N/A	N/A
Man Lift	68.7	61.7	N/A	N/A	N/A	N/A
Generator	80.6	77.6	N/A	N/A	N/A	N/A
Backhoe	68	64	N/A	N/A	N/A	N/A
Front End Loader	75.6	71.6	N/A	N/A	N/A	N/A
Tractor	72	68	N/A	N/A	N/A	N/A
Welder / Torch	70.5	66.5	N/A	N/A	N/A	N/A
Total	82.5	80.9	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential - North - Typical	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	170	0
Man Lift	No	20		74.7	170	0
Man Lift	No	20		74.7	170	0
Man Lift	No	20		74.7	170	0
Generator	No	50		80.6	170	0
Backhoe	No	40		77.6	170	0
Front End Loader	No	40		79.1	170	0
Tractor	No	40	84		170	0
Welder / Torch	No	40		74	170	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		69.9	62	N/A	N/A	N/A	N/A
Man Lift		64.1	57.1	N/A	N/A	N/A	N/A
Man Lift		64.1	57.1	N/A	N/A	N/A	N/A
Man Lift		64.1	57.1	N/A	N/A	N/A	N/A
Generator		70	67	N/A	N/A	N/A	N/A
Backhoe		66.9	63	N/A	N/A	N/A	N/A
Front End Loader		68.5	64.5	N/A	N/A	N/A	N/A
Tractor		73.4	69.4	N/A	N/A	N/A	N/A
Welder / Torch		63.4	59.4	N/A	N/A	N/A	N/A
	Total	73.4	73.5	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/28/2019
Case Description: Marisol SP - Del Mar - Arch Coating

		---- Receptor #1 ----		
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential - North - Closest	Residential	60	55	50

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	50	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		77.7	73.7	N/A	N/A	N/A	N/A
	Total	77.7	73.7	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

		---- Receptor #2 ----		
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential - North - Typical	Residential	60	55	50

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	170	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		67	63.1	N/A	N/A	N/A	N/A
	Total	67	63.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Report date: 10/28/2019
Case Description: Marisol SP - Del Mar - Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential - North - Closest	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	30	0
Paver	No	50		77.2	75	0
Pumps	No	50		80.9	50	0
Pumps	No	50		80.9	100	0
Roller	No	20		80	150	0
Roller	No	20		80	200	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver		81.7	78.6	N/A	N/A	N/A	N/A
Paver		73.7	70.7	N/A	N/A	N/A	N/A
Pumps		80.9	77.9	N/A	N/A	N/A	N/A
Pumps		74.9	71.9	N/A	N/A	N/A	N/A
Roller		70.5	63.5	N/A	N/A	N/A	N/A
Roller		68	61	N/A	N/A	N/A	N/A
	Total	81.7	82.2	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential - North - Typical	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	170	0
Paver	No	50		77.2	170	0
Pumps	No	50		80.9	170	0
Pumps	No	50		80.9	170	0
Roller	No	20		80	170	0
Roller	No	20		80	170	0

	Results Calculated (dBA)		Noise Limits (dBA) Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	66.6	63.6	N/A	N/A	N/A	N/A
Paver	66.6	63.6	N/A	N/A	N/A	N/A

Pumps		70.3	67.3	N/A	N/A	N/A	N/A
Pumps		70.3	67.3	N/A	N/A	N/A	N/A
Roller		69.4	62.4	N/A	N/A	N/A	N/A
Roller		69.4	62.4	N/A	N/A	N/A	N/A
	Total	70.3	72.7	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX C

Traffic Noise Modeling
Input/Output Files

Dudek 12 December 2017
MG TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Cal Run

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Hwy 101 n of Via de la Valle	76.0	point1	1	2,476.2	7,183.8	0.00				Average	
		point3	3	2,773.8	5,853.8	0.00				Average	
		point4	4	2,896.3	5,215.0	0.00				Average	
		point5	5	2,992.5	4,795.0	0.00				Average	
		point6	6	3,022.8	4,555.3	0.00				Average	
		point7	7	3,050.4	4,252.1	0.00					
S Sierra Avenue	38.0	point34	34	2,130.7	7,038.5	0.00				Average	
		point17	17	2,263.1	6,255.7	0.00				Average	
		point18	18	2,445.0	5,258.0	0.00				Average	
		point19	19	2,538.7	4,800.5	0.00				Average	
		point20	20	2,632.4	4,320.9	0.00				Average	
		point21	21	2,635.1	4,246.5	0.00					
Via de la Valle	65.0	point37	37	3,057.1	4,246.0	0.00				Average	
		point24	24	3,468.9	4,249.8	0.00				Average	
		point25	25	4,514.1	4,288.0	0.00				Average	
		point26	26	5,278.1	4,315.8	0.00				Average	
		point27	27	5,510.7	4,288.0	0.00				Average	
		point28	28	5,648.5	4,255.0	0.00				Average	
		point29	29	6,128.1	4,097.9	0.00				Average	
		point30	30	6,489.1	3,990.4	0.00				Average	
		point31	31	6,748.2	3,940.8	0.00				Average	
		point32	32	6,875.0	3,946.3	0.00				Average	
		point33	33	7,470.3	4,023.4	0.00				Average	
		point2	2	7,718.4	4,100.6	0.00					
Camino del Mar	64.0	point38	38	3,050.1	4,249.0	58.00				Average	

		point8	8	3,036.6	3,951.7	50.00				Average	
		point9	9	3,022.8	3,700.8	42.00				Average	
		point10	10	2,998.0	3,295.7	35.00				Average	
		point11	11	3,004.6	2,971.9	32.00				Average	
		point12	12	3,041.8	2,689.8	30.00					
Border Ave	38.0	point39	39	2,635.1	4,246.5	0.00				Average	
		point22	22	3,037.5	4,244.9	0.00					
Camino del Mar-2	64.0	point42	42	3,041.8	2,689.8	30.00				Average	
		point13	13	3,149.0	1,950.4	20.00				Average	
		point14	14	3,209.6	1,492.9	12.00				Average	
		point15	15	3,408.0	269.2	12.00					

Dudek 12 December 2017
MG TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Cal Run

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Hwy 101 n of Via de la Valle	point1	1	942	40	6	40	0	0	6	40	0	0
	point3	3	942	40	6	40	0	0	6	40	0	0
	point4	4	942	40	6	40	0	0	6	40	0	0
	point5	5	942	40	6	40	0	0	6	40	0	0
	point6	6	942	40	6	40	0	0	6	40	0	0
	point7	7										
S Sierra Avenue	point34	34	0	0	0	0	0	0	0	0	0	0
	point17	17	0	0	0	0	0	0	0	0	0	0
	point18	18	0	0	0	0	0	0	0	0	0	0
	point19	19	0	0	0	0	0	0	0	0	0	0
	point20	20	0	0	0	0	0	0	0	0	0	0
	point21	21										
Via de la Valle	point37	37	942	40	18	40	0	0	6	40	0	0
	point24	24	942	40	18	40	0	0	6	40	0	0
	point25	25	942	40	18	40	0	0	6	40	0	0
	point26	26	942	40	18	40	0	0	6	40	0	0
	point27	27	942	40	18	40	0	0	6	40	0	0
	point28	28	942	40	18	40	0	0	6	40	0	0
	point29	29	942	40	18	40	0	0	6	40	0	0
	point30	30	942	40	18	40	0	0	6	40	0	0
	point31	31	942	40	18	40	0	0	6	40	0	0
	point32	32	942	40	18	40	0	0	6	40	0	0
	point33	33	942	40	18	40	0	0	6	40	0	0

	point2	2										
Camino del Mar	point38	38	912	25	6	25	0	0	6	25	0	0
	point8	8	912	25	6	25	0	0	6	25	0	0
	point9	9	912	25	6	25	0	0	6	25	0	0
	point10	10	912	25	6	25	0	0	6	25	0	0
	point11	11	912	25	6	25	0	0	6	25	0	0
	point12	12										
Border Ave	point39	39	0	0	0	0	0	0	0	0	0	0
	point22	22										
Camino del Mar-2	point42	42	708	30	12	30	6	30	0	0	6	30
	point13	13	708	30	12	30	6	30	0	0	6	30
	point14	14	708	30	12	30	6	30	0	0	6	30
	point15	15										

Dudek 12 December 2017
MG TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Cal Run

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1 - Preserve south of project site	1	1	2,931.7	3,287.4	72.00	5.00	59.80	66	10.0	8.0	Y
ST2 - Residences south of project site	2	1	3,202.9	1,054.9	14.00	5.00	58.70	66	10.0	8.0	
ST3 - Residences east of project site	3	1	3,887.5	4,304.4	82.00	5.00	67.50	66	10.0	8.0	Y
ST4 - Residences north of project site	4	1	2,936.7	4,850.8	68.00	5.00	66.50	66	10.0	8.0	Y

Dudek
MG
12 December 2017
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Cal Run
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST1 - Preserve south of project site	1	1	59.8	58.5	66	-1.3	10	----	58.5	0.0	8	-8.0
ST2 - Residences south of project site	2	1	58.7	59.2	66	0.5	10	----	59.2	0.0	8	-8.0
ST3 - Residences east of project site	3	1	67.5	66.6	66	-0.9	10	Snd Lvl	66.6	0.0	8	-8.0
ST4 - Residences north of project site	4	1	66.5	65.8	66	-0.7	10	----	65.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek 9 September 2019
MG TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Hwy 101 n of Via de la Valle	76.0	point1	1	2,476.2	7,183.8	67.00				Average	
		point3	3	2,773.8	5,853.8	66.00				Average	
		point4	4	2,896.3	5,215.0	65.00				Average	
		point5	5	2,992.5	4,795.0	64.00				Average	
		point6	6	3,022.8	4,555.3	63.00				Average	
		point7	7	3,050.4	4,252.1	62.00					
S Sierra Avenue	38.0	point34	34	2,130.7	7,038.5	83.00				Average	
		point17	17	2,263.1	6,255.7	82.00				Average	
		point18	18	2,445.0	5,258.0	82.00				Average	
		point19	19	2,538.7	4,800.5	82.00				Average	
		point20	20	2,632.4	4,320.9	81.00				Average	
		point21	21	2,635.1	4,246.5	80.00					
Via de la Valle	65.0	point37	37	3,057.1	4,246.0	80.00				Average	
		point24	24	3,468.9	4,249.8	62.00				Average	
		point25	25	4,514.1	4,288.0	72.00				Average	
		point26	26	5,278.1	4,315.8	58.00				Average	
		point27	27	5,510.7	4,288.0	55.00				Average	
		point28	28	5,648.5	4,255.0	49.00				Average	
		point29	29	6,128.1	4,097.9	35.00				Average	
		point30	30	6,489.1	3,990.4	24.00				Average	
		point31	31	6,748.2	3,940.8	16.00				Average	
		point32	32	6,875.0	3,946.3	17.00				Average	
		point33	33	7,470.3	4,023.4	22.00				Average	
		point2	2	7,718.4	4,100.6	24.00					
Camino del Mar	64.0	point38	38	3,050.4	4,252.1	62.00				Average	

		point8	8	3,036.6	3,951.7	50.00				Average	
		point9	9	3,022.8	3,700.8	42.00				Average	
		point10	10	2,998.0	3,295.7	35.00				Average	
		point11	11	3,004.6	2,971.9	32.00				Average	
		point12	12	3,041.8	2,689.8	30.00				Average	
		point13	13	3,149.0	1,950.4	20.00				Average	
		point14	14	3,209.6	1,492.9	12.00				Average	
		point15	15	3,408.0	269.2	12.00					
Border Ave	38.0	point39	39	2,635.1	4,246.5	80.00				Average	
		point22	22	3,037.5	4,244.9	62.00					

Dudek 9 September
MG TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Percentages
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414

Roadway	Points												
Name	Name	No.	Segment										
			Total	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			Volume	P	S	P	S	P	S	P	S	P	S
			veh/hr	%	mph	%	mph	%	mph	%	mph	%	mph
Hwy 101 n of Via de la Valle	point1	1	1790	97	35	2	35	1	35	0	0	0	0
	point3	3	1790	97	35	2	35	1	35	0	0	0	0
	point4	4	1790	97	35	2	35	1	35	0	0	0	0
	point5	5	1790	97	35	2	35	1	35	0	0	0	0
	point6	6	1790	97	35	2	35	1	35	0	0	0	0
	point7	7											
S Sierra Avenue	point34	34	340	97	25	2	25	1	25	0	0	0	0
	point17	17	340	97	25	2	25	1	25	0	0	0	0
	point18	18	340	97	25	2	25	1	25	0	0	0	0
	point19	19	340	97	25	2	25	1	25	0	0	0	0
	point20	20	340	97	25	2	25	1	25	0	0	0	0
	point21	21											
Via de la Valle	point37	37	1880	97	45	2	45	1	45	0	0	0	0
	point24	24	1880	97	45	2	45	1	45	0	0	0	0
	point25	25	1880	97	45	2	45	1	45	0	0	0	0
	point26	26	1880	97	45	2	45	1	45	0	0	0	0
	point27	27	1880	97	45	2	45	1	45	0	0	0	0
	point28	28	1880	97	45	2	45	1	45	0	0	0	0
	point29	29	1880	97	45	2	45	1	45	0	0	0	0
	point30	30	1880	97	45	2	45	1	45	0	0	0	0
	point31	31	1880	97	45	2	45	1	45	0	0	0	0
	point32	32	1880	97	45	2	45	1	45	0	0	0	0
	point33	33	1880	97	45	2	45	1	45	0	0	0	0

	point2	2											
Camino del Mar	point38	38	1530	97	30	2	30	1	30	0	0	0	0
	point8	8	1530	97	30	2	30	1	30	0	0	0	0
	point9	9	1530	97	30	2	30	1	30	0	0	0	0
	point10	10	1530	97	30	2	30	1	30	0	0	0	0
	point11	11	1530	97	30	2	30	1	30	0	0	0	0
	point12	12	1530	97	30	2	30	1	30	0	0	0	0
	point13	13	1530	97	30	2	30	1	30	0	0	0	0
	point14	14	1530	97	30	2	30	1	30	0	0	0	0
	point15	15											
Border Ave	point39	39	340	97	25	2	25	1	25	0	0	0	0
	point22	22											

Dudek 9 September 2019
MG TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1 - Preserve south of project site	1	1	2,931.7	3,287.4	72.00	5.00	0.00	66	10.0	8.0	Y
ST2 - Residences south of project site	2	1	3,202.9	1,054.9	14.00	5.00	0.00	66	10.0	8.0	Y
ST3 - Residences east of project site	3	1	3,887.5	4,334.2	82.00	5.00	0.00	66	10.0	8.0	Y
ST4 - Residences north of project site	4	1	2,926.8	4,848.0	68.00	5.00	0.00	66	10.0	8.0	Y
M1 - Residences northeast of project site	6	1	2,486.1	4,674.7	85.00	5.00	0.00	66	10.0	8.0	Y
M2 - Residences north of project site	7	1	2,791.4	4,305.0	75.00	5.00	0.00	66	10.0	8.0	Y

Dudek
MG
9 September 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST1 - Preserve south of project site	1	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0
ST2 - Residences south of project site	2	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
ST3 - Residences east of project site	3	1	0.0	68.7	66	68.7	10	Snd Lvl	68.7	0.0	8	-8.0
ST4 - Residences north of project site	4	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
M1 - Residences northeast of project site	6	1	0.0	56.7	66	56.7	10	----	56.7	0.0	8	-8.0
M2 - Residences north of project site	7	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	6	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek 9 September 2019
MG TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Ex + Proj

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Hwy 101 n of Via de la Valle	76.0	point1	1	2,476.2	7,183.8	67.00				Average	
		point3	3	2,773.8	5,853.8	66.00				Average	
		point4	4	2,896.3	5,215.0	65.00				Average	
		point5	5	2,992.5	4,795.0	64.00				Average	
		point6	6	3,022.8	4,555.3	63.00				Average	
		point7	7	3,050.4	4,252.1	62.00					
S Sierra Avenue	38.0	point34	34	2,130.7	7,038.5	83.00				Average	
		point17	17	2,263.1	6,255.7	82.00				Average	
		point18	18	2,445.0	5,258.0	82.00				Average	
		point19	19	2,538.7	4,800.5	82.00				Average	
		point20	20	2,632.4	4,320.9	81.00				Average	
		point21	21	2,635.1	4,246.5	80.00					
Via de la Valle	65.0	point37	37	3,057.1	4,246.0	80.00				Average	
		point24	24	3,468.9	4,249.8	62.00				Average	
		point25	25	4,514.1	4,288.0	72.00				Average	
		point26	26	5,278.1	4,315.8	58.00				Average	
		point27	27	5,510.7	4,288.0	55.00				Average	
		point28	28	5,648.5	4,255.0	49.00				Average	
		point29	29	6,128.1	4,097.9	35.00				Average	
		point30	30	6,489.1	3,990.4	24.00				Average	
		point31	31	6,748.2	3,940.8	16.00				Average	
		point32	32	6,875.0	3,946.3	17.00				Average	
		point33	33	7,470.3	4,023.4	22.00				Average	
		point2	2	7,718.4	4,100.6	24.00					
Camino del Mar	64.0	point38	38	3,050.4	4,252.1	62.00				Average	

		point8	8	3,036.6	3,951.7	50.00				Average	
		point9	9	3,022.8	3,700.8	42.00				Average	
		point10	10	2,998.0	3,295.7	35.00				Average	
		point11	11	3,004.6	2,971.9	32.00				Average	
		point12	12	3,041.8	2,689.8	30.00				Average	
		point13	13	3,149.0	1,950.4	20.00				Average	
		point14	14	3,209.6	1,492.9	12.00				Average	
		point15	15	3,408.0	269.2	12.00					
Border Ave	38.0	point39	39	2,635.1	4,246.5	80.00				Average	
		point22	22	3,037.5	4,244.9	62.00					

Dudek 9 September
MG TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Percentages
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Ex + Proj

Roadway	Points												
Name	Name	No.	Segment										
			Total	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			Volume	P	S	P	S	P	S	P	S	P	S
			veh/hr	%	mph	%	mph	%	mph	%	mph	%	mph
Hwy 101 n of Via de la Valle	point1	1	1810	97	35	2	35	1	35	0	0	0	0
	point3	3	1810	97	35	2	35	1	35	0	0	0	0
	point4	4	1810	97	35	2	35	1	35	0	0	0	0
	point5	5	1810	97	35	2	35	1	35	0	0	0	0
	point6	6	1810	97	35	2	35	1	35	0	0	0	0
	point7	7											
S Sierra Avenue	point34	34	346	97	25	2	25	1	25	0	0	0	0
	point17	17	346	97	25	2	25	1	25	0	0	0	0
	point18	18	346	97	25	2	25	1	25	0	0	0	0
	point19	19	346	97	25	2	25	1	25	0	0	0	0
	point20	20	346	97	25	2	25	1	25	0	0	0	0
	point21	21											
Via de la Valle	point37	37	1977	97	45	2	45	1	45	0	0	0	0
	point24	24	1977	97	45	2	45	1	45	0	0	0	0
	point25	25	1977	97	45	2	45	1	45	0	0	0	0
	point26	26	1977	97	45	2	45	1	45	0	0	0	0
	point27	27	1977	97	45	2	45	1	45	0	0	0	0
	point28	28	1977	97	45	2	45	1	45	0	0	0	0
	point29	29	1977	97	45	2	45	1	45	0	0	0	0
	point30	30	1977	97	45	2	45	1	45	0	0	0	0
	point31	31	1977	97	45	2	45	1	45	0	0	0	0
	point32	32	1977	97	45	2	45	1	45	0	0	0	0
	point33	33	1977	97	45	2	45	1	45	0	0	0	0

	point2	2											
Camino del Mar	point38	38	1545	97	30	2	30	1	30	0	0	0	0
	point8	8	1545	97	30	2	30	1	30	0	0	0	0
	point9	9	1545	97	30	2	30	1	30	0	0	0	0
	point10	10	1545	97	30	2	30	1	30	0	0	0	0
	point11	11	1545	97	30	2	30	1	30	0	0	0	0
	point12	12	1545	97	30	2	30	1	30	0	0	0	0
	point13	13	1545	97	30	2	30	1	30	0	0	0	0
	point14	14	1545	97	30	2	30	1	30	0	0	0	0
	point15	15											
Border Ave	point39	39	346	97	25	2	25	1	25	0	0	0	0
	point22	22											

Dudek 9 September 2019
MG TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Ex + Proj

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1 - Preserve south of project site	1	1	2,931.7	3,287.4	72.00	5.00	0.00	66	10.0	8.0	Y
ST2 - Residences south of project site	2	1	3,202.9	1,054.9	14.00	5.00	0.00	66	10.0	8.0	Y
ST3 - Residences east of project site	3	1	3,887.5	4,334.1	82.00	5.00	0.00	66	10.0	8.0	Y
ST4 - Residences north of project site	4	1	2,926.8	4,848.0	68.00	5.00	0.00	66	10.0	8.0	Y
M1 - Residences northeast of project site	6	1	2,486.1	4,674.7	85.00	5.00	0.00	66	10.0	8.0	Y
M2 - Residences north of project site	7	1	2,791.4	4,305.0	75.00	5.00	0.00	66	10.0	8.0	Y

Dudek
MG
9 September 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Ex + Proj
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST1 - Preserve south of project site	1	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
ST2 - Residences south of project site	2	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0
ST3 - Residences east of project site	3	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0
ST4 - Residences north of project site	4	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
M1 - Residences northeast of project site	6	1	0.0	56.8	66	56.8	10	----	56.8	0.0	8	-8.0
M2 - Residences north of project site	7	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	6	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek 9 September 2019
MG TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Future

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Hwy 101 n of Via de la Valle	76.0	point1	1	2,476.2	7,183.8	67.00				Average	
		point3	3	2,773.8	5,853.8	66.00				Average	
		point4	4	2,896.3	5,215.0	65.00				Average	
		point5	5	2,992.5	4,795.0	64.00				Average	
		point6	6	3,022.8	4,555.3	63.00				Average	
		point7	7	3,050.4	4,252.1	62.00					
S Sierra Avenue	38.0	point34	34	2,130.7	7,038.5	83.00				Average	
		point17	17	2,263.1	6,255.7	82.00				Average	
		point18	18	2,445.0	5,258.0	82.00				Average	
		point19	19	2,538.7	4,800.5	82.00				Average	
		point20	20	2,632.4	4,320.9	81.00				Average	
		point21	21	2,635.1	4,246.5	80.00					
Via de la Valle	65.0	point37	37	3,057.1	4,246.0	80.00				Average	
		point24	24	3,468.9	4,249.8	62.00				Average	
		point25	25	4,514.1	4,288.0	72.00				Average	
		point26	26	5,278.1	4,315.8	58.00				Average	
		point27	27	5,510.7	4,288.0	55.00				Average	
		point28	28	5,648.5	4,255.0	49.00				Average	
		point29	29	6,128.1	4,097.9	35.00				Average	
		point30	30	6,489.1	3,990.4	24.00				Average	
		point31	31	6,748.2	3,940.8	16.00				Average	
		point32	32	6,875.0	3,946.3	17.00				Average	
		point33	33	7,470.3	4,023.4	22.00				Average	
		point2	2	7,718.4	4,100.6	24.00					
Camino del Mar	64.0	point38	38	3,050.4	4,252.1	62.00				Average	

		point8	8	3,036.6	3,951.7	50.00				Average	
		point9	9	3,022.8	3,700.8	42.00				Average	
		point10	10	2,998.0	3,295.7	35.00				Average	
		point11	11	3,004.6	2,971.9	32.00				Average	
		point12	12	3,041.8	2,689.8	30.00				Average	
		point13	13	3,149.0	1,950.4	20.00				Average	
		point14	14	3,209.6	1,492.9	12.00				Average	
		point15	15	3,408.0	269.2	12.00					
Border Ave	38.0	point39	39	2,635.1	4,246.5	80.00				Average	
		point22	22	3,037.5	4,244.9	62.00					

Dudek 9 September
MG TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Percentages
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Future

Roadway	Points												
Name	Name	No.	Segment										
			Total	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			Volume	P	S	P	S	P	S	P	S	P	S
			veh/hr	%	mph	%	mph	%	mph	%	mph	%	mph
Hwy 101 n of Via de la Valle	point1	1	2660	97	35	2	35	1	35	0	0	0	0
	point3	3	2660	97	35	2	35	1	35	0	0	0	0
	point4	4	2660	97	35	2	35	1	35	0	0	0	0
	point5	5	2660	97	35	2	35	1	35	0	0	0	0
	point6	6	2660	97	35	2	35	1	35	0	0	0	0
	point7	7											
S Sierra Avenue	point34	34	390	97	25	2	25	1	25	0	0	0	0
	point17	17	390	97	25	2	25	1	25	0	0	0	0
	point18	18	390	97	25	2	25	1	25	0	0	0	0
	point19	19	390	97	25	2	25	1	25	0	0	0	0
	point20	20	390	97	25	2	25	1	25	0	0	0	0
	point21	21											
Via de la Valle	point37	37	2170	97	45	2	45	1	45	0	0	0	0
	point24	24	2170	97	45	2	45	1	45	0	0	0	0
	point25	25	2170	97	45	2	45	1	45	0	0	0	0
	point26	26	2170	97	45	2	45	1	45	0	0	0	0
	point27	27	2170	97	45	2	45	1	45	0	0	0	0
	point28	28	2170	97	45	2	45	1	45	0	0	0	0
	point29	29	2170	97	45	2	45	1	45	0	0	0	0
	point30	30	2170	97	45	2	45	1	45	0	0	0	0
	point31	31	2170	97	45	2	45	1	45	0	0	0	0
	point32	32	2170	97	45	2	45	1	45	0	0	0	0
	point33	33	2170	97	45	2	45	1	45	0	0	0	0

	point2	2											
Camino del Mar	point38	38	1820	97	30	2	30	1	30	0	0	0	0
	point8	8	1820	97	30	2	30	1	30	0	0	0	0
	point9	9	1820	97	30	2	30	1	30	0	0	0	0
	point10	10	1820	97	30	2	30	1	30	0	0	0	0
	point11	11	1820	97	30	2	30	1	30	0	0	0	0
	point12	12	1820	97	30	2	30	1	30	0	0	0	0
	point13	13	1820	97	30	2	30	1	30	0	0	0	0
	point14	14	1820	97	30	2	30	1	30	0	0	0	0
	point15	15											
Border Ave	point39	39	390	97	25	2	25	1	25	0	0	0	0
	point22	22											

Dudek 9 September 2019
MG TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Future

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1 - Preserve south of project site	1	1	2,931.7	3,287.4	72.00	5.00	0.00	66	10.0	8.0	Y
ST2 - Residences south of project site	2	1	3,202.9	1,054.9	14.00	5.00	0.00	66	10.0	8.0	Y
ST3 - Residences east of project site	3	1	3,887.5	4,334.1	82.00	5.00	0.00	66	10.0	8.0	Y
ST4 - Residences north of project site	4	1	2,926.8	4,848.0	68.00	5.00	0.00	66	10.0	8.0	Y
M1 - Residences northeast of project site	6	1	2,486.1	4,674.7	85.00	5.00	0.00	66	10.0	8.0	Y
M2 - Residences north of project site	7	1	2,791.4	4,305.0	75.00	5.00	0.00	66	10.0	8.0	Y

Dudek
MG
9 September 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 10414
RUN: Del Mar Beach Resort PN 10414 Future
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST1 - Preserve south of project site	1	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
ST2 - Residences south of project site	2	1	0.0	63.2	66	63.2	10	----	63.2	0.0	8	-8.0
ST3 - Residences east of project site	3	1	0.0	69.3	66	69.3	10	Snd Lvl	69.3	0.0	8	-8.0
ST4 - Residences north of project site	4	1	0.0	68.7	66	68.7	10	Snd Lvl	68.7	0.0	8	-8.0
M1 - Residences northeast of project site	6	1	0.0	57.6	66	57.6	10	----	57.6	0.0	8	-8.0
M2 - Residences north of project site	7	1	0.0	62.3	66	62.3	10	----	62.3	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	6	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek 9 September 2019
MG TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 10414
RUN: Del Mar BchRsrt PN10414 FWP OnSite

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Hwy 101 n of Via de la Valle	76.0	point1	1	2,476.2	7,183.8	67.00				Average	
		point3	3	2,773.8	5,853.8	66.00				Average	
		point4	4	2,896.3	5,215.0	65.00				Average	
		point5	5	2,992.5	4,795.0	64.00				Average	
		point6	6	3,022.8	4,555.3	63.00				Average	
		point7	7	3,050.4	4,252.1	62.00					
S Sierra Avenue	38.0	point34	34	2,130.7	7,038.5	83.00				Average	
		point17	17	2,263.1	6,255.7	82.00				Average	
		point18	18	2,445.0	5,258.0	82.00				Average	
		point19	19	2,538.7	4,800.5	82.00				Average	
		point20	20	2,632.4	4,320.9	81.00				Average	
		point21	21	2,635.1	4,246.5	80.00					
Via de la Valle	65.0	point37	37	3,057.1	4,246.0	80.00				Average	
		point24	24	3,468.9	4,249.8	62.00				Average	
		point25	25	4,514.1	4,288.0	72.00				Average	
		point26	26	5,278.1	4,315.8	58.00				Average	
		point27	27	5,510.7	4,288.0	55.00				Average	
		point28	28	5,648.5	4,255.0	49.00				Average	
		point29	29	6,128.1	4,097.9	35.00				Average	
		point30	30	6,489.1	3,990.4	24.00				Average	
		point31	31	6,748.2	3,940.8	16.00				Average	
		point32	32	6,875.0	3,946.3	17.00				Average	
		point33	33	7,470.3	4,023.4	22.00				Average	
		point2	2	7,718.4	4,100.6	24.00					
Border Ave	38.0	point39	39	2,635.1	4,246.5	80.00				Average	

		point22	22	3,037.5	4,244.9	62.00					
Camino del Mar	64.0	point38	38	3,050.1	4,249.0	62.00				Average	
		point8	8	3,036.6	3,951.7	50.00				Average	
		point9	9	3,022.8	3,700.8	42.00				Average	
		point10	10	2,998.0	3,295.7	35.00				Average	
		point11	11	3,004.6	2,971.9	32.00				Average	
		point42	42	3,041.8	2,689.8	30.00				Average	
		point13	13	3,149.0	1,950.4	20.00				Average	
		point14	14	3,209.6	1,492.9	12.00				Average	
		point15	15	3,408.0	269.2	12.00					

Dudek 9 September
MG TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Percentages
PROJECT/CONTRACT: 10414
RUN: Del Mar BchRsrt PN10414 FWP OnSite

Roadway	Points												
Name	Name	No.	Segment										
			Total	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			Volume	P	S	P	S	P	S	P	S	P	S
			veh/hr	%	mph	%	mph	%	mph	%	mph	%	mph
Hwy 101 n of Via de la Valle	point1	1	2680	97	35	2	35	1	35	0	0	0	0
	point3	3	2680	97	35	2	35	1	35	0	0	0	0
	point4	4	2680	97	35	2	35	1	35	0	0	0	0
	point5	5	2680	97	35	2	35	1	35	0	0	0	0
	point6	6	2680	97	35	2	35	1	35	0	0	0	0
	point7	7											
S Sierra Avenue	point34	34	396	97	25	2	25	1	25	0	0	0	0
	point17	17	396	97	25	2	25	1	25	0	0	0	0
	point18	18	396	97	25	2	25	1	25	0	0	0	0
	point19	19	396	97	25	2	25	1	25	0	0	0	0
	point20	20	396	97	25	2	25	1	25	0	0	0	0
	point21	21											
Via de la Valle	point37	37	2267	97	45	2	45	1	45	0	0	0	0
	point24	24	2267	97	45	2	45	1	45	0	0	0	0
	point25	25	2267	97	45	2	45	1	45	0	0	0	0
	point26	26	2267	97	45	2	45	1	45	0	0	0	0
	point27	27	2267	97	45	2	45	1	45	0	0	0	0
	point28	28	2267	97	45	2	45	1	45	0	0	0	0
	point29	29	2267	97	45	2	45	1	45	0	0	0	0
	point30	30	2267	97	45	2	45	1	45	0	0	0	0
	point31	31	2267	97	45	2	45	1	45	0	0	0	0
	point32	32	2267	97	45	2	45	1	45	0	0	0	0
	point33	33	2267	97	45	2	45	1	45	0	0	0	0

	point2	2											
Border Ave	point39	39	396	97	25	2	25	1	25	0	0	0	0
	point22	22											
Camino del Mar	point38	38	1835	97	30	2	30	1	30	0	0	0	0
	point8	8	1835	97	30	2	30	1	30	0	0	0	0
	point9	9	1835	97	30	2	30	1	30	0	0	0	0
	point10	10	1835	97	30	2	30	1	30	0	0	0	0
	point11	11	1835	97	30	2	30	1	30	0	0	0	0
	point42	42	1835	97	30	2	30	1	30	0	0	0	0
	point13	13	1835	97	30	2	30	1	30	0	0	0	0
	point14	14	1835	97	30	2	30	1	30	0	0	0	0
	point15	15											

Dudek 9 September 2019
MG TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 10414
RUN: Del Mar BchRsrt PN10414 FWP OnSite

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1 - Preserve south of project site	1	1	2,931.7	3,287.4	72.00	5.00	59.80	66	10.0	8.0	Y
ST2 - Residences south of project site	3	1	3,202.9	1,054.9	14.00	5.00	58.70	66	10.0	8.0	Y
ST3 - Residences east of project site	4	1	3,887.5	4,334.1	82.00	5.00	67.50	66	10.0	8.0	Y
ST4 - Residences north of project site	5	1	2,926.8	4,848.0	68.00	5.00	66.50	66	10.0	8.0	Y
M1 - Residences northeast of project site	6	1	2,486.1	4,674.7	85.00	5.00	0.00	66	10.0	8.0	
M2 - Residences north of project site	7	1	2,791.4	4,305.0	75.00	5.00	0.00	66	10.0	8.0	

Dudek
MG
9 September 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 10414
RUN: Del Mar BchRsrt PN10414 FWP OnSite
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST1 - Preserve south of project site	1	1	59.8	64.3	66	4.5	10	----	64.3	0.0	8	-8.0
ST2 - Residences south of project site	3	1	58.7	63.2	66	4.5	10	----	63.2	0.0	8	-8.0
ST3 - Residences east of project site	4	1	67.5	69.5	66	2.0	10	Snd Lvl	69.5	0.0	8	-8.0
ST4 - Residences north of project site	5	1	66.5	68.8	66	2.3	10	Snd Lvl	68.8	0.0	8	-8.0
M1 - Residences northeast of project site	6	1	0.0	57.7	66	57.7	10	----	57.7	0.0	8	-8.0
M2 - Residences north of project site	7	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	6	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek 9 September 2019
MG TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 10414
RUN: Del Mar BchRsrt FWP Rev 2019

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Hwy 101 n of Via de la Valle	76.0	point1	1	2,476.2	7,183.8	67.00				Average	
		point3	3	2,773.8	5,853.8	66.00				Average	
		point4	4	2,896.3	5,215.0	65.00				Average	
		point5	5	2,992.5	4,795.0	64.00				Average	
		point6	6	3,022.8	4,555.3	63.00				Average	
		point7	7	3,050.4	4,252.1	62.00					
S Sierra Avenue	38.0	point34	34	2,130.7	7,038.5	83.00				Average	
		point17	17	2,263.1	6,255.7	82.00				Average	
		point18	18	2,445.0	5,258.0	82.00				Average	
		point19	19	2,538.7	4,800.5	82.00				Average	
		point20	20	2,632.4	4,320.9	81.00				Average	
		point21	21	2,635.1	4,246.5	80.00					
Via de la Valle	65.0	point37	37	3,057.1	4,246.0	62.00				Average	
		point24	24	3,468.9	4,249.8	68.00				Average	
		point25	25	4,514.1	4,288.0	72.00				Average	
		point26	26	5,278.1	4,315.8	58.00				Average	
		point27	27	5,510.7	4,288.0	55.00				Average	
		point28	28	5,648.5	4,255.0	49.00				Average	
		point29	29	6,128.1	4,097.9	35.00				Average	
		point30	30	6,489.1	3,990.4	24.00				Average	
		point31	31	6,748.2	3,940.8	16.00				Average	
		point32	32	6,875.0	3,946.3	17.00				Average	
		point33	33	7,470.3	4,023.4	22.00				Average	
		point2	2	7,718.4	4,100.6	24.00					
Border Ave	38.0	point39	39	2,635.1	4,246.5	80.00				Average	

		point22	22	3,037.5	4,244.9	62.00					
Camino del Mar	64.0	point38	38	3,050.1	4,249.0	62.00				Average	
		point8	8	3,036.6	3,951.7	50.00				Average	
		point9	9	3,022.8	3,700.8	42.00				Average	
		point10	10	2,998.0	3,295.7	35.00				Average	
		point11	11	3,004.6	2,971.9	32.00				Average	
		point42	42	3,041.8	2,689.8	30.00				Average	
		point13	13	3,149.0	1,950.4	20.00				Average	
		point14	14	3,209.6	1,492.9	12.00				Average	
		point15	15	3,408.0	269.2	12.00					

Dudek 9 September
MG TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Percentages
PROJECT/CONTRACT: 10414
RUN: Del Mar BchRsrt FWP Rev 2019

Roadway	Points												
Name	Name	No.	Segment										
			Total	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			Volume	P	S	P	S	P	S	P	S	P	S
			veh/hr	%	mph	%	mph	%	mph	%	mph	%	mph
Hwy 101 n of Via de la Valle	point1	1	2680	97	35	2	35	1	35	0	0	0	0
	point3	3	2680	97	35	2	35	1	35	0	0	0	0
	point4	4	2680	97	35	2	35	1	35	0	0	0	0
	point5	5	2680	97	35	2	35	1	35	0	0	0	0
	point6	6	2680	97	35	2	35	1	35	0	0	0	0
	point7	7											
S Sierra Avenue	point34	34	396	97	25	2	25	1	25	0	0	0	0
	point17	17	396	97	25	2	25	1	25	0	0	0	0
	point18	18	396	97	25	2	25	1	25	0	0	0	0
	point19	19	396	97	25	2	25	1	25	0	0	0	0
	point20	20	396	97	25	2	25	1	25	0	0	0	0
	point21	21											
Via de la Valle	point37	37	2267	97	45	2	45	1	45	0	0	0	0
	point24	24	2267	97	45	2	45	1	45	0	0	0	0
	point25	25	2267	97	45	2	45	1	45	0	0	0	0
	point26	26	2267	97	45	2	45	1	45	0	0	0	0
	point27	27	2267	97	45	2	45	1	45	0	0	0	0
	point28	28	2267	97	45	2	45	1	45	0	0	0	0
	point29	29	2267	97	45	2	45	1	45	0	0	0	0
	point30	30	2267	97	45	2	45	1	45	0	0	0	0
	point31	31	2267	97	45	2	45	1	45	0	0	0	0
	point32	32	2267	97	45	2	45	1	45	0	0	0	0
	point33	33	2267	97	45	2	45	1	45	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Percentages **10414**

	point2	2											
Border Ave	point39	39	396	97	25	2	25	1	25	0	0	0	0
	point22	22											
Camino del Mar	point38	38	1835	97	30	2	30	1	30	0	0	0	0
	point8	8	1835	97	30	2	30	1	30	0	0	0	0
	point9	9	1835	97	30	2	30	1	30	0	0	0	0
	point10	10	1835	97	30	2	30	1	30	0	0	0	0
	point11	11	1835	97	30	2	30	1	30	0	0	0	0
	point42	42	1835	97	30	2	30	1	30	0	0	0	0
	point13	13	1835	97	30	2	30	1	30	0	0	0	0
	point14	14	1835	97	30	2	30	1	30	0	0	0	0
	point15	15											

Dudek 9 September 2019
MG TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 10414
RUN: Del Mar BchRsrt FWP Rev 2019

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M3	169	1	2,874.1	4,188.8	62.00	5.00	0.00	66	10.0	8.0	Y
M4	170	1	2,934.0	4,193.7	62.00	5.00	0.00	66	10.0	8.0	Y
M5	171	1	2,959.0	4,150.0	62.00	5.00	0.00	66	10.0	8.0	Y
M6	172	1	2,922.2	4,092.9	62.00	5.00	0.00	66	10.0	8.0	Y
M7	173	1	2,933.3	4,025.1	62.00	5.00	0.00	66	10.0	8.0	Y
M8	174	1	2,923.1	3,939.7	62.00	5.00	0.00	66	10.0	8.0	Y
M9	175	1	2,910.1	3,819.1	62.00	5.00	0.00	66	10.0	8.0	Y
M10	177	1	2,899.7	3,712.1	82.00	5.00	0.00	66	10.0	8.0	Y
M11	179	1	2,847.6	3,597.7	82.00	5.00	0.00	66	10.0	8.0	Y
M12	180	1	2,772.7	3,506.0	82.00	5.00	0.00	66	10.0	8.0	Y
M13	184	1	2,761.4	3,454.9	82.00	5.00	0.00	66	10.0	8.0	Y
M14	185	1	2,707.0	3,381.7	82.00	5.00	0.00	66	10.0	8.0	Y
M15	188	1	2,645.8	3,339.4	82.00	5.00	0.00	66	10.0	8.0	Y
M16	191	1	2,541.8	3,238.5	82.00	5.00	0.00	66	10.0	8.0	Y
M17	193	1	2,548.6	3,308.6	92.00	5.00	0.00	66	10.0	8.0	Y
M18	194	1	2,401.8	3,578.9	82.00	5.00	0.00	66	10.0	8.0	Y
M19	195	1	2,672.6	3,641.6	82.00	5.00	0.00	66	10.0	8.0	Y
M20	197	1	2,574.2	3,640.5	82.00	5.00	0.00	66	10.0	8.0	Y
M21	200	1	2,699.7	3,745.6	82.00	5.00	0.00	66	10.0	8.0	Y
M22	201	1	2,575.9	3,780.5	82.00	5.00	0.00	66	10.0	8.0	Y
M23	202	1	2,714.9	3,910.4	82.00	5.00	0.00	66	10.0	8.0	Y
M24	203	1	2,610.3	3,915.6	82.00	5.00	0.00	66	10.0	8.0	Y

M25	204	1	2,422.9	3,956.4	82.00	5.00	0.00	66	10.0	8.0	Y
M26	205	1	2,232.9	3,859.5	82.00	5.00	0.00	66	10.0	8.0	Y
M27	207	1	2,229.6	3,973.5	82.00	5.00	0.00	66	10.0	8.0	Y
M28	208	1	2,601.5	4,025.2	82.00	5.00	0.00	66	10.0	8.0	Y
M29	209	1	2,420.8	4,056.6	82.00	5.00	0.00	66	10.0	8.0	Y
M30	210	1	2,267.1	4,038.8	82.00	5.00	0.00	66	10.0	8.0	Y
M31	211	1	2,668.0	4,137.8	82.00	5.00	0.00	66	10.0	8.0	Y
M32	212	1	2,525.5	4,173.0	82.00	5.00	0.00	66	10.0	8.0	Y
M33	213	1	2,378.7	4,147.0	82.00	5.00	0.00	66	10.0	8.0	Y
M34	214	1	2,251.0	4,191.9	82.00	5.00	0.00	66	10.0	8.0	Y
M3-2	221	1	2,874.1	4,188.8	62.00	15.00	0.00	66	10.0	8.0	Y
M4-2	222	1	2,934.0	4,193.7	62.00	15.00	0.00	66	10.0	8.0	Y
M5-2	223	1	2,959.0	4,150.0	62.00	15.00	0.00	66	10.0	8.0	Y
M6-2	224	1	2,922.2	4,092.9	62.00	15.00	0.00	66	10.0	8.0	Y
M7-2	225	1	2,933.3	4,025.1	62.00	15.00	0.00	66	10.0	8.0	Y
M8-2	226	1	2,923.1	3,939.7	62.00	15.00	0.00	66	10.0	8.0	Y
M9-2	227	1	2,910.1	3,819.1	62.00	15.00	0.00	66	10.0	8.0	Y
M10-2	228	1	2,899.7	3,712.1	82.00	15.00	0.00	66	10.0	8.0	Y
M11-2	229	1	2,847.6	3,597.7	82.00	15.00	0.00	66	10.0	8.0	Y
M12-2	230	1	2,772.7	3,506.0	82.00	15.00	0.00	66	10.0	8.0	Y
M13-2	231	1	2,761.4	3,454.9	82.00	15.00	0.00	66	10.0	8.0	Y
M14-2	232	1	2,707.0	3,381.7	82.00	15.00	0.00	66	10.0	8.0	Y
M15-2	233	1	2,645.8	3,339.4	82.00	15.00	0.00	66	10.0	8.0	Y
M19-2	234	1	2,672.6	3,641.6	82.00	15.00	0.00	66	10.0	8.0	Y
M21-2	235	1	2,699.7	3,745.6	82.00	15.00	0.00	66	10.0	8.0	Y
M23-2	236	1	2,714.9	3,910.4	82.00	15.00	0.00	66	10.0	8.0	Y
M31-2	237	1	2,668.0	4,137.8	82.00	15.00	0.00	66	10.0	8.0	Y
M32-2	238	1	2,525.5	4,173.0	82.00	15.00	0.00	66	10.0	8.0	Y
M10-3	239	1	2,899.7	3,712.1	82.00	25.00	0.00	66	10.0	8.0	Y
M11-3	240	1	2,847.6	3,597.7	82.00	25.00	0.00	66	10.0	8.0	Y
M12-3	241	1	2,772.7	3,506.0	82.00	25.00	0.00	66	10.0	8.0	Y
M13-3	242	1	2,761.4	3,454.9	82.00	25.00	0.00	66	10.0	8.0	Y
M19-3	243	1	2,672.6	3,641.6	82.00	25.00	0.00	66	10.0	8.0	Y
M21-3	244	1	2,699.7	3,745.6	82.00	25.00	0.00	66	10.0	8.0	Y
M23-3	245	1	2,714.9	3,910.4	82.00	25.00	0.00	66	10.0	8.0	Y
M31-3	246	1	2,668.0	4,137.8	82.00	25.00	0.00	66	10.0	8.0	Y

M32-3	247	1	2,525.5	4,173.0	82.00	25.00	0.00	66	10.0	8.0	Y

Dudek 9 September 2019
MG TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: 10414
RUN: Del Mar BchRsrt FWP Rev 2019

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per Unit Area	$ per Unit Vol.	Top Width	Run:Rise	$ per Unit Length			X	Y	Z	at Point	Seg Ht Incre-ment	Perturbs #Up	#Dn	On Struct?	Important Reflec-tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier24	W	0.00	99.99	0.00				0.00	point232	232	2,754.4	4,202.4	62.00	20.00	0.00	0	0		
									point234	234	2,823.4	4,187.1	62.00	20.00	0.00	0	0		
									point235	235	2,892.8	4,188.2	62.00	20.00	0.00	0	0		
									point236	236	2,891.7	4,192.6	62.00	20.00	0.00	0	0		
									point237	237	2,968.8	4,192.6	62.00	20.00	0.00	0	0		
									point238	238	2,967.7	4,152.1	62.00	20.00	0.00	0	0		
									point239	239	2,816.8	4,151.0	62.00	20.00	0.00	0	0		
									point240	240	2,744.6	4,166.9	62.00	20.00					
Barrier25	W	0.00	99.99	0.00				0.00	point414	414	2,818.0	3,970.0	62.00	20.00	0.00	0	0		
									point242	242	2,829.3	4,047.3	62.00	20.00	0.00	0	0		
									point243	243	2,884.9	4,038.6	62.00	20.00	0.00	0	0		
									point244	244	2,891.0	4,084.6	62.00	20.00	0.00	0	0		
									point245	245	2,896.2	4,083.7	62.00	20.00	0.00	0	0		
									point246	246	2,896.2	4,091.6	62.00	20.00	0.00	0	0		
									point247	247	2,942.2	4,087.2	62.00	20.00	0.00	0	0		
									point248	248	2,941.3	4,078.5	62.00	20.00	0.00	0	0		
									point249	249	2,937.9	4,076.8	62.00	20.00	0.00	0	0		
									point250	250	2,914.4	3,898.0	62.00	20.00	0.00	0	0		
									point251	251	2,888.4	3,901.4	62.00	20.00	0.00	0	0		
									point252	252	2,886.6	3,888.4	62.00	20.00	0.00	0	0		
									point253	253	2,864.9	3,892.7	62.00	20.00	0.00	0	0		
									point254	254	2,873.6	3,963.9	62.00	20.00					
Barrie26	W	0.00	99.99	0.00				0.00	point255	255	2,862.7	3,875.4	62.00	20.00	0.00	0	0		
									point256	256	2,913.0	3,867.2	62.00	20.00	0.00	0	0		
									point257	257	2,900.5	3,766.1	62.00	20.00	0.00	0	0		
									point258	258	2,905.9	3,764.5	62.00	20.00	0.00	0	0		
									point259	259	2,903.7	3,734.9	62.00	20.00	0.00	0	0		
									point260	260	2,811.3	3,733.8	62.00	20.00	0.00	0	0		
									point261	261	2,811.8	3,772.7	62.00	20.00	0.00	0	0		
									point262	262	2,851.2	3,772.1	62.00	20.00					
Barrier27	W	0.00	99.99	0.00				0.00	point418	418	2,833.3	3,696.6	82.00	30.00	0.00	0	0		
									point264	264	2,906.4	3,696.6	82.00	30.00	0.00	0	0		
									point265	265	2,903.6	3,651.1	82.00	30.00	0.00	0	0		
									point266	266	2,879.9	3,651.5	82.00	30.00	0.00	0	0		
									point267	267	2,880.9	3,642.5	82.00	30.00	0.00	0	0		

									point268	268	2,863.0	3,643.9	82.00	30.00	0.00	0	0		
									point269	269	2,862.6	3,635.0	82.00	30.00	0.00	0	0		
									point270	270	2,844.7	3,634.6	82.00	30.00	0.00	0	0		
									point271	271	2,844.7	3,572.6	82.00	30.00	0.00	0	0		
									point272	272	2,825.4	3,572.6	82.00	30.00	0.00	0	0		
									point273	273	2,825.4	3,563.6	82.00	30.00	0.00	0	0		
									point274	274	2,808.2	3,564.0	82.00	30.00	0.00	0	0		
									point275	275	2,808.0	3,554.9	82.00	30.00	0.00	0	0		
									point276	276	2,788.8	3,555.1	82.00	30.00	0.00	0	0		
									point277	277	2,788.8	3,545.9	82.00	30.00	0.00	0	0		
									point278	278	2,770.0	3,546.0	82.00	30.00	0.00	0	0		
									point279	279	2,770.3	3,457.7	82.00	30.00	0.00	0	0		
									point280	280	2,751.2	3,458.0	82.00	30.00	0.00	0	0		
									point281	281	2,751.7	3,448.9	82.00	30.00	0.00	0	0		
									point282	282	2,714.0	3,449.2	82.00	20.00	0.00	0	0		
									point283	283	2,714.8	3,385.8	82.00	20.00	0.00	0	0		
									point284	284	2,696.2	3,386.3	82.00	20.00	0.00	0	0		
									point285	285	2,696.2	3,378.4	82.00	20.00	0.00	0	0		
									point286	286	2,677.3	3,378.9	82.00	20.00	0.00	0	0		
									point287	287	2,678.7	3,369.9	82.00	20.00	0.00	0	0		
									point288	288	2,660.4	3,369.3	82.00	20.00	0.00	0	0		
									point289	289	2,659.5	3,359.5	82.00	20.00	0.00	0	0		
									point290	290	2,641.1	3,360.4	82.00	20.00	0.00	0	0		
									point291	291	2,640.8	3,351.4	82.00	20.00	0.00	0	0		
									point292	292	2,623.0	3,350.9	82.00	20.00	0.00	0	0		
									point293	293	2,622.9	3,335.9	82.00	20.00	0.00	0	0		
									point294	294	2,603.7	3,335.9	82.00	10.00	0.00	0	0		
									point295	295	2,603.7	3,319.9	82.00	10.00	0.00	0	0		
									point296	296	2,590.8	3,313.2	82.00	10.00	0.00	0	0		
									point297	297	2,590.5	3,267.2	82.00	10.00	0.00	0	0		
									point298	298	2,571.6	3,267.5	82.00	10.00	0.00	0	0		
									point299	299	2,571.6	3,247.5	82.00	10.00	0.00	0	0		
									point300	300	2,551.6	3,247.9	82.00	10.00	0.00	0	0		
									point301	301	2,551.9	3,242.7	82.00	10.00	0.00	0	0		
									point302	302	2,514.7	3,242.0	82.00	10.00	0.00	0	0		
									point303	303	2,513.7	3,248.9	82.00	10.00	0.00	0	0		
									point304	304	2,497.5	3,248.5	82.00	10.00	0.00	0	0		
									point305	305	2,496.8	3,287.1	82.00	10.00	0.00	0	0		
									point306	306	2,509.5	3,286.8	82.00	10.00	0.00	0	0		
									point307	307	2,508.9	3,297.5	82.00	10.00	0.00	0	0		
									point308	308	2,481.3	3,298.2	82.00	10.00	0.00	0	0		
									point309	309	2,466.8	3,396.7	82.00	10.00	0.00	0	0		
									point310	310	2,433.0	3,398.8	82.00	20.00	0.00	0	0		
									point311	311	2,437.9	3,478.0	82.00	20.00	0.00	0	0		
									point312	312	2,426.8	3,478.0	82.00	20.00	0.00	0	0		
									point313	313	2,428.9	3,546.9	82.00	20.00	0.00	0	0		
									point314	314	2,450.3	3,546.9	82.00	30.00	0.00	0	0		
									point315	315	2,453.0	3,665.0	82.00	30.00	0.00	0	0		
									point316	316	2,516.4	3,663.4	82.00	30.00	0.00	0	0		

									point317	317	2,517.0	3,614.7	82.00	30.00	0.00	0	0		
									point318	318	2,771.8	3,612.6	82.00	30.00	0.00	0	0		
									point319	319	2,770.8	3,644.3	82.00	30.00	0.00	0	0		
									point320	320	2,833.1	3,644.8	82.00	30.00					
Barrier28	W	0.00	99.99	0.00				0.00	point420	420	2,651.7	3,715.4	82.00	30.00	0.00	0	0		
									point322	322	2,680.3	3,672.9	82.00	30.00	0.00	0	0		
									point323	323	2,679.5	3,651.2	82.00	30.00	0.00	0	0		
									point324	324	2,670.8	3,643.3	82.00	30.00	0.00	0	0		
									point325	325	2,650.8	3,639.0	82.00	30.00	0.00	0	0		
									point326	326	2,647.3	3,652.9	82.00	30.00	0.00	0	0		
									point327	327	2,594.4	3,649.4	82.00	30.00	0.00	0	0		
									point328	328	2,582.3	3,671.1	82.00	30.00	0.00	0	0		
									point329	329	2,590.1	3,708.5	82.00	30.00					
Barrier29	W	0.00	99.99	0.00				0.00	point423	423	2,624.5	3,821.5	82.00	30.00	0.00	0	0		
									point399	399	2,692.2	3,817.2	82.00	30.00	0.00	0	0		
									point400	400	2,707.8	3,775.5	82.00	30.00	0.00	0	0		
									point401	401	2,705.2	3,750.3	82.00	30.00	0.00	0	0		
									point402	402	2,625.4	3,752.9	82.00	30.00	0.00	0	0		
									point403	403	2,623.6	3,819.8	82.00	30.00					
Barrier30	W	0.00	99.99	0.00				0.00	point425	425	2,253.8	3,782.4	82.00	30.00	0.00	0	0		
									point390	390	2,316.3	3,788.5	82.00	30.00	0.00	0	0		
									point391	391	2,325.9	3,748.5	82.00	30.00	0.00	0	0		
									point392	392	2,340.7	3,749.4	82.00	30.00	0.00	0	0		
									point393	393	2,358.0	3,655.6	82.00	30.00	0.00	0	0		
									point394	394	2,309.4	3,646.1	82.00	30.00	0.00	0	0		
									point395	395	2,296.4	3,694.7	82.00	30.00	0.00	0	0		
									point396	396	2,280.7	3,691.2	82.00	30.00					
Barrier31	W	0.00	99.99	0.00				0.00	point426	426	2,448.3	4,079.0	82.00	30.00	0.00	0	0		
									point405	405	2,516.0	4,077.4	82.00	30.00	0.00	0	0		
									point406	406	2,531.6	4,033.0	82.00	30.00	0.00	0	0		
									point407	407	2,529.0	4,007.8	82.00	30.00	0.00	0	0		
									point408	408	2,449.1	4,010.4	82.00	30.00	0.00	0	0		
									point409	409	2,447.4	4,077.2	82.00	30.00					
Barrier32	W	0.00	99.99	0.00				0.00	point428	428	2,591.5	4,134.2	82.00	30.00	0.00	0	0		
									point353	353	2,657.1	4,142.4	82.00	30.00	0.00	0	0		
									point354	354	2,682.5	4,100.8	82.00	30.00	0.00	0	0		
									point355	355	2,685.4	4,074.0	82.00	30.00	0.00	0	0		
									point356	356	2,600.1	4,065.1	82.00	30.00	0.00	0	0		
									point357	357	2,590.7	4,132.5	82.00	30.00					
Barrier33	W	0.00	99.99	0.00				0.00	point430	430	2,449.3	3,753.7	82.00	30.00	0.00	0	0		
									point359	359	2,517.0	3,749.4	82.00	30.00	0.00	0	0		
									point360	360	2,532.6	3,707.7	82.00	30.00	0.00	0	0		
									point361	361	2,530.1	3,682.5	82.00	30.00	0.00	0	0		
									point362	362	2,450.2	3,685.2	82.00	30.00	0.00	0	0		
									point363	363	2,448.4	3,752.0	82.00	30.00					
Barrier34	W	0.00	99.99	0.00				0.00	point432	432	2,638.0	3,924.1	82.00	30.00	0.00	0	0		
									point347	347	2,705.7	3,919.7	82.00	30.00	0.00	0	0		
									point348	348	2,721.4	3,878.0	82.00	30.00	0.00	0	0		
									point349	349	2,718.7	3,852.9	82.00	30.00	0.00	0	0		

									point350	350	2,638.9	3,855.5	82.00	30.00	0.00	0	0		
									point351	351	2,637.1	3,922.3	82.00	30.00					
Barrier35	W	0.00	99.99	0.00				0.00	point435	435	2,445.3	3,864.9	82.00	30.00	0.00	0	0		
									point335	335	2,513.0	3,860.6	82.00	30.00	0.00	0	0		
									point336	336	2,528.6	3,818.9	82.00	30.00	0.00	0	0		
									point337	337	2,526.0	3,793.7	82.00	30.00	0.00	0	0		
									point338	338	2,446.1	3,796.3	82.00	30.00					
Barrier36	W	0.00	99.99	0.00				0.00	point436	436	2,629.1	4,037.6	82.00	30.00	0.00	0	0		
									point341	341	2,696.8	4,033.3	82.00	30.00	0.00	0	0		
									point342	342	2,712.4	3,991.6	82.00	30.00	0.00	0	0		
									point343	343	2,709.8	3,966.4	82.00	30.00	0.00	0	0		
									point344	344	2,629.9	3,969.0	82.00	30.00	0.00	0	0		
									point345	345	2,628.2	4,035.9	82.00	30.00					
Barrier37	W	0.00	99.99	0.00				0.00	point437	437	2,446.1	3,796.3	82.00	30.00	0.00	0	0		
									point339	339	2,444.4	3,863.2	82.00	30.00					
Barrier38	W	0.00	99.99	0.00				0.00	point440	440	2,456.9	3,973.5	82.00	30.00	0.00	0	0		
									point411	411	2,524.6	3,969.2	82.00	30.00	0.00	0	0		
									point412	412	2,540.3	3,927.5	82.00	30.00	0.00	0	0		
									point331	331	2,537.7	3,902.3	82.00	30.00	0.00	0	0		
									point332	332	2,457.8	3,905.0	82.00	30.00					
Barrier39	W	0.00	99.99	0.00				0.00	point444	444	2,447.9	4,193.0	82.00	30.00	0.00	0	0		
									point365	365	2,515.7	4,188.7	82.00	30.00	0.00	0	0		
									point366	366	2,531.3	4,147.0	82.00	30.00	0.00	0	0		
									point367	367	2,528.7	4,121.8	82.00	30.00	0.00	0	0		
									point368	368	2,448.8	4,124.5	82.00	30.00	0.00	0	0		
									point369	369	2,447.1	4,191.3	82.00	30.00					
Barrier40	W	0.00	99.99	0.00				0.00	point446	446	2,263.6	4,201.3	82.00	30.00	0.00	0	0		
									point371	371	2,359.8	4,206.2	82.00	30.00	0.00	0	0		
									point372	372	2,362.0	4,144.9	82.00	30.00	0.00	0	0		
									point373	373	2,267.9	4,137.8	82.00	30.00					
Barrier41	W	0.00	99.99	0.00				0.00	point448	448	2,282.2	4,107.2	82.00	30.00	0.00	0	0		
									point375	375	2,362.5	4,102.3	82.00	30.00	0.00	0	0		
									point376	376	2,350.5	4,033.4	82.00	30.00	0.00	0	0		
									point377	377	2,350.0	4,015.3	82.00	30.00	0.00	0	0		
									point378	378	2,316.0	4,017.5	82.00	30.00	0.00	0	0		
									point379	379	2,313.3	4,037.7	82.00	30.00	0.00	0	0		
									point380	380	2,272.8	4,043.2	82.00	30.00					
Barrier42	W	0.00	99.99	0.00				0.00	point450	450	2,240.0	3,987.4	82.00	30.00	0.00	0	0		
									point382	382	2,335.2	3,991.3	82.00	30.00	0.00	0	0		
									point383	383	2,340.1	3,928.9	82.00	30.00	0.00	0	0		
									point384	384	2,246.0	3,924.5	82.00	30.00					
Barrier43	W	0.00	99.99	0.00				0.00	point452	452	2,254.7	3,816.3	82.00	30.00	0.00	0	0		
									point386	386	2,245.1	3,876.3	82.00	30.00	0.00	0	0		
									point387	387	2,338.8	3,892.1	82.00	30.00	0.00	0	0		
									point388	388	2,347.0	3,830.1	82.00	30.00					

Dudek			9 September 2019	
MG			TNM 2.5	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	10414			
RUN:	Del Mar BchRsrt FWP Rev 2019			
Terrain Line	Points			
Name	No.	Coordinates (ground)		
		X	Y	Z
		ft	ft	ft
Terrain Line1	1	2,030.4	4,245.5	10.00
	3	2,078.5	4,098.9	10.00
	4	2,091.6	4,015.7	10.00
	5	2,093.8	3,910.7	10.00
	6	2,096.0	3,842.9	10.00
	7	2,126.6	3,770.7	10.00
	8	2,144.2	3,755.4	10.00
	9	2,131.0	3,707.2	10.00
	10	2,227.3	3,514.7	10.00
	11	2,341.1	3,208.4	10.00
	12	2,446.1	2,963.4	10.00
	13	2,516.1	2,840.8	10.00
	14	2,538.0	2,781.8	10.00
	15	2,653.9	2,899.9	10.00
	16	2,710.8	2,989.6	15.00
	17	2,802.7	3,215.0	20.00
	18	2,859.6	3,295.9	30.00
	19	2,918.7	3,464.4	35.00
	20	2,955.8	3,626.3	40.00
	21	2,990.8	3,877.9	55.00
	22	3,023.7	4,241.1	60.00
	23	2,671.4	4,221.4	80.00
	24	2,625.5	4,206.1	80.00
	25	2,605.8	4,208.2	80.00

	26	2,590.5	4,221.4	80.00
	27	2,581.7	4,241.1	80.00
	2	2,135.4	4,245.5	80.00
Terrain Line2	28	2,966.5	4,218.5	62.00
	30	2,978.9	4,185.4	62.00
	31	2,958.2	3,964.8	75.00
	32	2,933.4	3,804.9	78.00
	33	2,925.1	3,704.3	82.00
	34	2,901.7	3,596.8	82.00
	35	2,860.3	3,530.6	82.00
	36	2,821.7	3,503.0	82.00
	37	2,801.0	3,431.3	82.00
	38	2,769.3	3,361.0	82.00
	39	2,734.9	3,311.4	82.00
	40	2,699.0	3,289.3	82.00
	41	2,648.0	3,307.2	82.00
	42	2,590.1	3,212.1	82.00
	43	2,557.0	3,197.0	82.00
	44	2,512.9	3,195.6	82.00
	45	2,470.2	3,209.4	82.00
	46	2,453.6	3,242.4	82.00
	47	2,426.1	3,304.5	82.00
	48	2,377.8	3,420.3	82.00

Dudek
MG
9 September 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 10414
RUN: Del Mar BchRsrt FWP Rev 2019
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M3	169	1	0.0	59.1	66	59.1	10	----	59.1	0.0	8	-8.0
M4	170	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
M5	171	1	0.0	60.3	66	60.3	10	----	60.3	0.0	8	-8.0
M6	172	1	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0
M7	173	1	0.0	54.0	66	54.0	10	----	54.0	0.0	8	-8.0
M8	174	1	0.0	50.9	66	50.9	10	----	50.9	0.0	8	-8.0
M9	175	1	0.0	48.9	66	48.9	10	----	48.9	0.0	8	-8.0
M10	177	1	0.0	57.3	66	57.3	10	----	57.3	0.0	8	-8.0
M11	179	1	0.0	52.5	66	52.5	10	----	52.5	0.0	8	-8.0
M12	180	1	0.0	51.1	66	51.1	10	----	51.1	0.0	8	-8.0
M13	184	1	0.0	49.7	66	49.7	10	----	49.7	0.0	8	-8.0
M14	185	1	0.0	49.0	66	49.0	10	----	49.0	0.0	8	-8.0
M15	188	1	0.0	49.9	66	49.9	10	----	49.9	0.0	8	-8.0
M16	191	1	0.0	49.3	66	49.3	10	----	49.3	0.0	8	-8.0
M17	193	1	0.0	49.3	66	49.3	10	----	49.3	0.0	8	-8.0
M18	194	1	0.0	34.8	66	34.8	10	----	34.8	0.0	8	-8.0
M19	195	1	0.0	49.1	66	49.1	10	----	49.1	0.0	8	-8.0
M20	197	1	0.0	37.8	66	37.8	10	----	37.8	0.0	8	-8.0
M21	200	1	0.0	50.5	66	50.5	10	----	50.5	0.0	8	-8.0
M22	201	1	0.0	40.1	66	40.1	10	----	40.1	0.0	8	-8.0
M23	202	1	0.0	52.8	66	52.8	10	----	52.8	0.0	8	-8.0
M24	203	1	0.0	44.8	66	44.8	10	----	44.8	0.0	8	-8.0
M25	204	1	0.0	37.9	66	37.9	10	----	37.9	0.0	8	-8.0
M26	205	1	0.0	29.5	66	29.5	10	----	29.5	0.0	8	-8.0

M27	207	1	0.0	36.3	66	36.3	10	----	36.3	0.0	8	-8.0
M28	208	1	0.0	39.0	66	39.0	10	----	39.0	0.0	8	-8.0
M29	209	1	0.0	40.7	66	40.7	10	----	40.7	0.0	8	-8.0
M30	210	1	0.0	31.5	66	31.5	10	----	31.5	0.0	8	-8.0
M31	211	1	0.0	56.6	66	56.6	10	----	56.6	0.0	8	-8.0
M32	212	1	0.0	54.5	66	54.5	10	----	54.5	0.0	8	-8.0
M33	213	1	0.0	46.6	66	46.6	10	----	46.6	0.0	8	-8.0
M34	214	1	0.0	44.6	66	44.6	10	----	44.6	0.0	8	-8.0
M3-2	221	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
M4-2	222	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
M5-2	223	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
M6-2	224	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
M7-2	225	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
M8-2	226	1	0.0	59.1	66	59.1	10	----	59.1	0.0	8	-8.0
M9-2	227	1	0.0	53.9	66	53.9	10	----	53.9	0.0	8	-8.0
M10-2	228	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
M11-2	229	1	0.0	57.3	66	57.3	10	----	57.3	0.0	8	-8.0
M12-2	230	1	0.0	56.6	66	56.6	10	----	56.6	0.0	8	-8.0
M13-2	231	1	0.0	55.9	66	55.9	10	----	55.9	0.0	8	-8.0
M14-2	232	1	0.0	54.9	66	54.9	10	----	54.9	0.0	8	-8.0
M15-2	233	1	0.0	52.8	66	52.8	10	----	52.8	0.0	8	-8.0
M19-2	234	1	0.0	51.1	66	51.1	10	----	51.1	0.0	8	-8.0
M21-2	235	1	0.0	51.4	66	51.4	10	----	51.4	0.0	8	-8.0
M23-2	236	1	0.0	55.2	66	55.2	10	----	55.2	0.0	8	-8.0
M31-2	237	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0
M32-2	238	1	0.0	57.0	66	57.0	10	----	57.0	0.0	8	-8.0
M10-3	239	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
M11-3	240	1	0.0	59.3	66	59.3	10	----	59.3	0.0	8	-8.0
M12-3	241	1	0.0	57.1	66	57.1	10	----	57.1	0.0	8	-8.0
M13-3	242	1	0.0	55.9	66	55.9	10	----	55.9	0.0	8	-8.0
M19-3	243	1	0.0	51.8	66	51.8	10	----	51.8	0.0	8	-8.0
M21-3	244	1	0.0	51.8	66	51.8	10	----	51.8	0.0	8	-8.0
M23-3	245	1	0.0	56.5	66	56.5	10	----	56.5	0.0	8	-8.0
M31-3	246	1	0.0	59.2	66	59.2	10	----	59.2	0.0	8	-8.0
M32-3	247	1	0.0	57.3	66	57.3	10	----	57.3	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	59	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX D

Rail Noise Modeling
Input/Output Files

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: Del Mar Resort Project - M3

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	60	46	54
Source 1	46	42	39
Source 2	47	43	40
Source 3	56	19	51
Source 4	57	2	51
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	470	distance (ft)	470	distance (ft)	470	distance (ft)	470
Daytime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	0	speed (mph)	0
(7 AM - 10 PM)	trains/hour	4.73333	trains/hour	4.73333	trains/hour	0	trains/hour	0
	locos/train	1	cars/train	5	locos/train	0	length of cars (ft) / train	0
Nighttime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour	2.11111	trains/hour	2.11111	trains/hour	1.22222	trains/hour	1.22222
	locos/train	1	cars/train	5	locos/train	5	length of cars (ft) / train	4800
Wheel Flats?		N	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Embedded Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Aerial Structure?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Barrier Present?	Y/N	Y	Y/N	Y	Y/N	Y	Y/N	Y
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
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Case: Del Mar Resort Project - M4, M7

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	62	48	56
Source 1	47	44	40
Source 2	49	45	42
Source 3	58	21	52
Source 4	59	4	53
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	360	distance (ft)	360	distance (ft)	360	distance (ft)	360
Daytime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	0	speed (mph)	0
(7 AM - 10 PM)	trains/hour	4.73333	trains/hour	4.73333	trains/hour	0	trains/hour	0
	locos/train	1	cars/train	5	locos/train	0	length of cars (ft) / train	0
Nighttime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour	2.11111	trains/hour	2.11111	trains/hour	1.22222	trains/hour	1.22222
	locos/train	1	cars/train	5	locos/train	5	length of cars (ft) / train	4800
Wheel Flats?		N	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Embedded Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Aerial Structure?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Barrier Present?	Y/N	Y	Y/N	Y	Y/N	Y	Y/N	Y
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: Del Mar Resort Project - M5, M6, M8, M9

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	64	49	58
Source 1	49	45	42
Source 2	50	47	43
Source 3	60	22	54
Source 4	61	5	55
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	280	distance (ft)	280	distance (ft)	280	distance (ft)	280
Daytime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	0	speed (mph)	0
(7 AM - 10 PM)	trains/hour	4.73333	trains/hour	4.73333	trains/hour	0	trains/hour	0
	locos/train	1	cars/train	5	locos/train	0	length of cars (ft) / train	0
Nighttime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour	2.11111	trains/hour	2.11111	trains/hour	1.22222	trains/hour	1.22222
	locos/train	1	cars/train	5	locos/train	5	length of cars (ft) / train	4800
Wheel Flats?		N	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Embedded Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Aerial Structure?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Barrier Present?	Y/N	Y	Y/N	Y	Y/N	Y	Y/N	Y
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
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Case: Del Mar Resort Project - M10

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	60	46	54
Source 1	46	42	39
Source 2	47	43	40
Source 3	56	19	51
Source 4	57	2	51
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	470	distance (ft)	470	distance (ft)	470	distance (ft)	470
Daytime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	0	speed (mph)	0
(7 AM - 10 PM)	trains/hour	4.73333	trains/hour	4.73333	trains/hour	0	trains/hour	0
	locos/train	1	cars/train	5	locos/train	0	length of cars (ft) / train	0
Nighttime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour	2.11111	trains/hour	2.11111	trains/hour	1.22222	trains/hour	1.22222
	locos/train	1	cars/train	5	locos/train	5	length of cars (ft) / train	4800
Wheel Flats?		N	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Embedded Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Aerial Structure?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Barrier Present?	Y/N	Y	Y/N	Y	Y/N	Y	Y/N	Y
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
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Case: Del Mar Resort Project - M11 M12 M13

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	59	45	53
Source 1	45	41	38
Source 2	46	42	39
Source 3	55	18	50
Source 4	56	1	50
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	550	distance (ft)	550	distance (ft)	550	distance (ft)	550
Daytime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	0	speed (mph)	0
(7 AM - 10 PM)	trains/hour	4.73333	trains/hour	4.73333	trains/hour	0	trains/hour	0
	locos/train	1	cars/train	5	locos/train	0	length of cars (ft) / train	0
Nighttime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour	2.11111	trains/hour	2.11111	trains/hour	1.22222	trains/hour	1.22222
	locos/train	1	cars/train	5	locos/train	5	length of cars (ft) / train	4800
Wheel Flats?		N	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Embedded Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Aerial Structure?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Barrier Present?	Y/N	Y	Y/N	Y	Y/N	Y	Y/N	Y
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
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Case: Del Mar Resort Project - M14 M15

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	59	44	53
Source 1	44	41	37
Source 2	45	42	38
Source 3	55	17	49
Source 4	56	0	50
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	600	distance (ft)	600	distance (ft)	600	distance (ft)	600
Daytime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	0	speed (mph)	0
(7 AM - 10 PM)	trains/hour	4.73333	trains/hour	4.73333	trains/hour	0	trains/hour	0
	locos/train	1	cars/train	5	locos/train	0	length of cars (ft) / train	0
Nighttime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour	2.11111	trains/hour	2.11111	trains/hour	1.22222	trains/hour	1.22222
	locos/train	1	cars/train	5	locos/train	5	length of cars (ft) / train	4800
Wheel Flats?		N	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Embedded Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Aerial Structure?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Barrier Present?	Y/N	Y	Y/N	Y	Y/N	Y	Y/N	Y
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: Del Mar Resort Project - M16 M17 M18

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	57	42	51
Source 1	42	38	35
Source 2	43	40	36
Source 3	53	15	47
Source 4	54	-2	48
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	820	distance (ft)	820	distance (ft)	820	distance (ft)	820
Daytime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	0	speed (mph)	0
(7 AM - 10 PM)	trains/hour	4.73333	trains/hour	4.73333	trains/hour	0	trains/hour	0
	locos/train	1	cars/train	5	locos/train	0	length of cars (ft) / train	0
Nighttime Hours	speed (mph)	70	speed (mph)	70	speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour	2.11111	trains/hour	2.11111	trains/hour	1.22222	trains/hour	1.22222
	locos/train	1	cars/train	5	locos/train	5	length of cars (ft) / train	4800
Wheel Flats?		N	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Embedded Track?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Aerial Structure?	Y/N	N	Y/N	N	Y/N	N	Y/N	N
Barrier Present?	Y/N	Y	Y/N	Y	Y/N	Y	Y/N	Y
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

Appendix H

Transportation Impact Analysis

LINSCOTT LAW & GREENSPAN engineers

TRANSPORTATION IMPACT ANALYSIS

MARISOL

Del Mar, California
December 11, 2019

LLG Ref. 3-19-3108

Prepared by:
Narasimha Prasad
Senior Transportation Engineer

Under the Supervision of:
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TABLE OF CONTENTS

SECTION	PAGE
Appendices	**vi**
List of Figures	**ix**
List of Tables	**xi**
1.0 Introduction	**1**
2.0 Project Description	**2**
2.1 Project Location	2
2.2 Project Description	2
2.3 Project Access	4
3.0 Existing Conditions	**9**
3.1 Existing Street Network	9
3.2 Existing Bicycle Network	12
3.3 Existing Pedestrian Conditions	12
3.4 Existing Transit Conditions	12
3.5 Existing Traffic Volumes	12
3.5.1 Pear Hour Intersection Volumes	13
3.5.2 Daily Segment Volumes	13
3.5.3 Freeway Mainline and Metered on-Ramp Volumes	13
4.0 Study Area, Analysis Approach and Methodology	**23**
4.1 Study Area	23
4.1.1 Determining The Project Study Area	23
4.2 Analysis Scenarios	24
4.3 Methodology	25
4.3.1 Signalized Intersections	25
4.3.2 Unsignalized Intersections	27
4.3.3 Street Segments	27
4.3.4 Freeway Mainline Operations	29
4.3.5 Metered Freeway Ramps	30
4.3.6 Arterial Analysis	30
5.0 Significance Criteria	**32**
6.0 Analysis of Existing Conditions	**33**
6.1 Typical Weekday / Weekend	33
6.1.1 Peak Hour Intersection Levels of Service (Typical Weekday / Weekend)	33
6.1.2 Daily Street Segment Levels of Service (Typical Weekday)	33

TABLE OF CONTENTS (CONTINUED)

SECTION			PAGE
		6.1.3 Freeway Mainline Segments	34
		6.1.4 Metered Freeway On-Ramps	34
	6.2	During Fair	41
		6.2.1 Peak Hour Intersection Levels of Service (During Fair)	41
		6.2.2 Daily Street Segment Levels of Service (During Fair)	41
	6.3	During Horse Races	45
		6.3.1 Peak Hour Intersection Levels of Service (During Horse Races)	45
		6.3.2 Daily Street Segment Levels of Service During Horse Races	45
7.0	**Cumulative Projects**		**49**
	7.1	Description of Projects	49
	7.2	Summary of Cumulative Projects Trips	51
8.0	**Trip Generation/Distribution/Assignment**		**61**
	8.1	Trip Generation	61
		8.1.1 Weekday Trip Generation	62
		8.1.2 Weekend Trip Generation	62
	8.2	Trip Distribution/Assignment	62
9.0	**Analysis of Near-Term Scenarios – Typical Weekday / Weekend**		**79**
	9.1	Existing + Project – Typical Weekday / Weekend	79
		9.1.1 Intersection Analysis	79
		9.1.2 Daily Street Segment Levels of Service	79
		9.1.3 Freeway Mainline Segments	80
		9.1.4 Freeway Metered On-Ramps	81
		9.1.5 Queuing Analysis	81
	9.2	Existing + Cumulative Projects – Typical Weekday / Weekend	92
		9.2.1 Intersection Analysis	92
		9.2.2 Daily Street Segment Levels of Service	92
		9.2.3 Freeway Mainline Segments	92
		9.2.4 Freeway Metered On-Ramps	93
	9.3	Existing + Cumulative Projects + Project – Typical Weekday / Weekend	93
		9.3.1 Intersection Analysis	93
		9.3.2 Daily Street Segment Levels of Service	94
		9.3.3 Freeway Mainline Segments	94
		9.3.4 Freeway Metered On-Ramps	95
10.0	**Analysis of Near-Term Scenarios – During Fair**		**103**
	10.1	Existing + Project – During Fair	103
		10.1.1 Intersection Analysis	103
		10.1.2 Daily Street Segment Levels of Service	103

TABLE OF CONTENTS (CONTINUED)

SECTION	PAGE
10.2 Existing + Cumulative Projects During Fair	109
10.2.1 Intersection Analysis	109
10.2.2 Daily Street Segment Levels of Service	109
10.3 Existing (During Fair) + Cumulative Projects + Project	109
10.3.1 Intersection Analysis	109
10.3.2 Daily Street Segment Levels of Service	110
11.0 Analysis of Near-Term Scenarios – During Races	**116**
11.1 Existing + Project During Horse Races	116
11.1.1 Intersection Analysis	116
11.1.2 Daily Street Segment Levels of Service	116
11.2 Existing + Cumulative Projects – During Horse Races	123
11.2.1 Intersection Analysis	123
11.2.2 Daily Street Segment Levels of Service	123
11.3 Existing (During Horse Races) + Cumulative Projects + Project	123
11.3.1 Intersection Analysis	123
11.3.2 Daily Street Segment Levels of Service	124
12.0 Analysis of Long-Term Scenarios	**131**
12.1 Year 2035 Horizon Year Traffic Volumes	131
12.2 Year 2035 Analyses	131
12.2.1 Intersection Analysis	131
12.2.2 Daily Street Segment Levels of Service	132
12.2.3 Freeway Mainline Segments	132
12.2.4 Freeway Metered On-Ramps	132
12.3 Year 2035 + Project	132
12.3.1 Intersection Analysis	132
12.3.2 Daily Street Segment Levels of Service	133
12.3.3 Freeway Mainline Segments	133
12.3.4 Freeway Metered On-Ramps	134
13.0 Alternate Project Traffic Assignment	**145**
13.1 During the Fair	145
13.1.1 Existing + Project	145
13.1.2 Existing + Cumulative Projects	145
13.1.3 Existing + Project + Cumulative Projects	147
13.2 During the Horse Races	147
13.2.1 Existing + Project	147
13.2.2 Existing + Cumulative Projects	147
13.2.3 Existing + Project + Cumulative Projects	147
13.3 Conclusions	147

TABLE OF CONTENTS (CONTINUED)

SECTION	PAGE
14.0 Lomas Santa Fe Drive Corridor Study	**150**
14.1 Near-Term Analysis	151
14.2 Long-Term Analysis	151
15.0 Access	**154**
16.0 Pedestrian Assessment	**156**
16.1 Pedestrian Improvements	156
17.0 Transportation Demand Management (TDM)	**158**
18.0 Construction	**159**
18.1 Purpose	159
18.2 Schedule	159
18.3 Passenger Car Equivalency	159
18.4 Construction Phase Generating the Highest Traffic	159
18.4.1 Grading Phase Traffic	159
18.4.2 Building Construction Phase Traffic	160
18.5 Haul Routes	160
18.6 Maximum Construction Traffic	160
19.0 Significance of Impacts and Mitigation Measures	**162**
19.1 Significance of Impacts	162
19.1.1 Direct and Cumulative impacts	162
19.1.2 Cumulative Only Impacts	162
19.2 Mitigation Measures	163
19.2.1 Direct and Cumulative Impacts	163
19.2.2 Cumulative Only Impacts	164
19.3 Post Mitigation Analysis	165
19.3.1 Near Term Direct Impacts	165
19.3.2 Near-Term Cumulative Impacts	166
19.3.3 Long-Term Cumulative Impacts	173
19.4 Signal Warrant Analysis	175
19.4.1 Via de la Valle / Cedros Avenue	176
19.4.2 Camino Del Mar / 27th Street	177
19.4.3 Camino Del Mar / Coast Boulevard	178
19.5 Queuing at Highway 101 / Via de la Valle	179
19.5.1 Highway 101 / Via de la Valle Intersection	179
19.5.2 Via de la Valle / Jimmy Durante Boulevard Intersection	179

APPENDICES

APPENDIX

A. Schedule of Events at Del Mar Fairgrounds; Intersection & Segment Manual Count Sheets – Typical Weekday; Typical Weekend; Fair; Horse Races – Weekday; Horse Races – Weekend; Freeway and Metered Ramp Volumes, K&D Factors and Truck Factors; Ramp Metered Rates; Signal Timing Plans; Adaptive Traffic Signal Control Case Studies Information

- A-1. Schedule of Events at Del Mar Fairgrounds
- A-2. Intersection & Segment Manual Count Sheets – Typical Weekday
- A-3. Intersection Manual Count Sheets – Typical Weekend
- A-4. Intersection & Segment Manual Count Sheets – Fair (Weekday)
- A-5. Intersection & Segment Manual Count Sheets – Fair (Weekend)
- A-6. Intersection & Segment Manual Count Sheets – Horse Races (Weekday)
- A-7. Intersection & Manual Count Sheets – Horse Races (Weekend)
- A-8. Freeway and Metered Ramp Volumes, K&D Factors and Truck Factors
- A-9. Ramp Metered Rates
- A-10. Signal Timing Plans
- A-11. Adaptive Traffic Signal Control Case Studies Information

B. Peak hour Intersection Analysis Worksheets – Existing (Typical)

- B-1. Typical Weekday
- B-2. Typical Weekend

C. Peak hour Worksheets – Existing (During Fair)

- C-1. Typical Weekday
- C-2. Typical Weekend

D. Peak hour Intersection Analysis Worksheets – Existing (During Horse Races)

- D-1. Typical Weekday
- D-2. Typical Weekend

E. Peak hour Intersection Analysis Worksheets – Existing + Project

- E-1. Typical Weekday
- E-2. Typical Weekend

F. Peak hour Intersection Analysis Worksheets – Existing + Cumulative Projects

- F-1. Cumulative Projects Data
- F-2. Typical Weekday
- F-3. Typical Weekend

LIST OF APPENDICES (CONTINUED)

APPENDIX

G. Peak hour Intersection Analysis Worksheets – Existing + Cumulative Projects + Project
   - G-1. Typical Weekday
   - G-2. Typical Weekend
   - G-3. Typical Weekday Arterial Analysis – Existing, Existing + Project, Existing + Cumulative Projects, Existing + Cumulative Projects + Project
   - G-4. Horse Race Arterial Analysis – Existing, Existing + Project, Existing + Cumulative Projects, Existing + Cumulative Projects + Project
   - G-5. Long-Term Arterial Analysis

H. Peak hour Intersection Analysis Worksheets – Existing + Project
   - H-1. Fair Weekday
   - H-2. Fair Weekend

I. Peak hour Intersection Analysis Worksheets – Existing + Cumulative Projects
   - I-2. Fair Weekday
   - I-3. Fair Weekend

J. Peak hour Intersection Analysis Worksheets – Existing + Cumulative Projects + Project
   - J-1. Fair Weekday
   - J-2. Fair Weekend

K. Peak hour Intersection Analysis Worksheets – Existing + Project
   - K-1. Horse Races Weekday
   - K-2. Horse Races Weekend

L. Peak hour Intersection Analysis Worksheets – Existing + Cumulative Projects
   - L-1. Horse Races Weekday
   - L-2. Horse Races Weekend

M. Peak hour Intersection Analysis Worksheets – Existing + Cumulative Projects + Project
   - M-1. Horse Races Weekday
   - M-2. Horse Races Weekend

N. Peak hour Intersection Analysis Worksheets – Year 2035

O. Peak hour Intersection Analysis Worksheets – Year 2035 + Project

P. Peak hour Intersection Analysis Worksheets – Alternate Project Traffic Assignment (Fair)
   - P-1. Existing + Project
   - P-2. Existing + Cumulative Projects

LIST OF APPENDICES (CONTINUED)

APPENDIX

P-3. Existing + Cumulative Projects + Project

Q. Peak hour Intersection Analysis Worksheets – Alternate Project Traffic Assignment (Horse Races)

Q-1. Existing + Project

Q-2. Existing + Cumulative Projects

Q-3. Existing + Cumulative Projects + Project

R. Lomas Santa Fe Drive Corridor

R-1 Information Regarding the Solana Beach Lomas Santa Fe Drive Corridor

R-2 Peak Hour Intersection Analysis Worksheets – Near -Term

R-3 Peak Hour Intersection Analysis Worksheets – Long Term

S. Marisol Transportation Demand Management Plan – July 2018

T. Mitigation Analysis

T-1 Significant Direct Impact Mitigation Intersection Analysis Worksheets

T-2 Long-Term Significant Cumulative Impact Mitigation Intersection Analysis Worksheets

T-3 Queuing Analysis Worksheets

LIST OF FIGURES

SECTION—FIGURE #		PAGE
Figure 2–1	Vicinity Map	6
Figure 2–2	Project Area Map	7
Figure 2–3	Site Plan	8
Figure 3–1	Existing Conditions Diagram	16
Figure 3–2	Typical Weekday Existing Traffic Volumes	17
Figure 3–3	Typical Weekend Existing Traffic Volumes	18
Figure 3–4	Weekday During Fair Existing Traffic Volumes	19
Figure 3–5	Weekend During Fair Existing Traffic Volumes	20
Figure 3–6	Weekday During Horse Races Existing Traffic Volumes	21
Figure 3–7	Weekend During Horse Races Existing Traffic Volumes	22
Figure 7–1	Cumulative Projects Location Map	53
Figure 7–2	Cumulative Projects Traffic Volumes	54
Figure 7–3	Typical Weekday Existing + Cumulative Projects Traffic Volumes	55
Figure 7–4	Typical Weekend Existing + Cumulative Projects Traffic Volumes	56
Figure 7–5	Weekday During Fair Existing + Cumulative Projects Traffic Volumes	57
Figure 7–6	Weekend During Fair Existing + Cumulative Projects Traffic Volumes	58
Figure 7–7	Weekday During Horse Races Existing + Cumulative Projects Traffic Volumes	59
Figure 7–8	Weekend During Horse Races Existing + Cumulative Projects Traffic Volumes	60
Figure 8–1	Project Traffic Distribution	64
Figure 8–2	Weekday Project Traffic Volumes	65
Figure 8–3	Weekend Project Traffic Volumes	66
Figure 8–4	Typical Weekday Existing + Project Daily and AM & PM Peak Hour Volumes	67
Figure 8–5	Typical Weekend Existing + Project PM Peak Hour Volumes	68
Figure 8–6	Weekday During Fair Existing + Project Daily and AM & PM Peak Hour Volumes	69
Figure 8–7	Weekend During Fair Existing + Project PM Peak Hour Volumes	70
Figure 8–8	Weekday During Horse Races Existing + Project Daily and PM Peak Hour Volumes	71
Figure 8–9	Weekend During Horse Races Existing + Project PM Peak Hour Traffic Volumes	72
Figure 8–10	Typical Weekday Existing + Cumulative Projects + Project Daily and AM & PM Peak Hour Volumes	73

LIST OF FIGURES (CONTINUED)

SECTION—FIGURE # **PAGE**

Figure 8–11 Typical Weekend Existing + Cumulative Projects + Project PM Peak Hour Volumes... 74

Figure 8–12 Weekday During Fair Existing + Cumulative Projects + Project Daily and AM & PM Peak Hour Volumes... 75

Figure 8–13 Weekend During Fair Existing + Cumulative Projects + Project PM Peak Hour Volumes... 76

Figure 8–14 Weekday During Horse Races Existing + Cumulative Projects + Project Daily and PM Peak Hour Volumes... 77

Figure 8–15 Weekend During Horse Races Existing + Cumulative Projects + Project PM Peak Hour Volumes... 78

Figure 12–1 Year 2035 Traffic Volumes... 143

Figure 12–2 Year 2035 + Project Traffic Volumes... 144

Figure 15–1 Recommended Access Configuration... 155

Figure 19–1 Via De La Valle / Jimmy Durante Boulevard Intersection Improvements... 181

Figure 19–2 Via De La Valle (Border Avenue) / Highway 101 (Camino Del Mar) Intersection Improvements... 182

Figure 19–3 Proposed Conceptual Plan - Via De La Valle Two Through Lanes from Highway 101 to 400’ east of Cedros Avenue... 183

LIST OF TABLES

SECTION—TABLE #	PAGE
Table 2-1 Proposed Land Uses	3
Table 3–1 Intersection Counts	14
Table 3–2 Existing Weekday Traffic Volumes	15
Table 4–1 Intersection Level of Service Descriptions	26
Table 4–2 Intersection LOS & Delay Ranges	26
Table 4–3 Average Daily Vehicle Trips – County of San Diego	28
Table 4–4 Caltrans District 11 - Freeway Segment Level Of Service Definitions	29
Table 4–5 Arterial Analysis Definitions	31
Table 5–1 Traffic Impact Significant Thresholds	32
Table 6–1 Existing Intersection Operations – Typical Weekday / Weekend	35
Table 6–2 Existing Street Segment Operations – Typical Weekday	38
Table 6–3 Existing Via De La Valle Arterial Peak Hour Operations – Typical Weekday Between Highway 101 and I-5	38
Table 6–4 Existing Freeway Mainline Segment Operations – Typical Weekday	39
Table 6–5 Existing Metered Ramps Operations – Typical Weekday	40
Table 6–6 Existing Intersection Operations – During Fair	42
Table 6–6 (Continued) Existing Intersection Operations – During Fair Weekday	43
Table 6–7 Existing Street Segment Operations – During Fair	44
Table 6–8 Existing Intersection Operations – During Horse Races Typical Weekday / Weekend	46
Table 6–9 Existing Street Segment Operations – During Horse Races (Weekday)	48
Table 7–1 Cumulative Projects Daily Trips	52
Table 8-1 Trip Generation	63
Table 9–1 Existing + Project Intersection Operations – Typical Weekday / Weekend	82
Table 9–2 Existing + Project Street Segment Operations – Typical Weekday	86
Table 9–3 Existing + Project Peak Hour Arterial Analysis – Typical Weekday	87
Table 9–4 Existing + Project Freeway Mainline Segment Operations – Typical Weekday	88
Table 9–5 Near-Term Metered Ramps Operations – Typical Weekday	89
Table 9-6 PM Peak Hour Forecasted Queue in Feet (95th Percentile)	90
Table 9-6 (Continued) PM Peak Hour Forecasted Queue in Feet (95th Percentile)	91
Table 9–7 Near-Term Intersection Operations – Typical Weekday / Weekend	96

LIST OF TABLES (CONTINUED)

SECTION—TABLE #	PAGE
Table 9–8 Near-Term Street Segment Operations – Typical Weekday	100
Table 9–9 Via de la Valle Near-Term Peak Hour Arterial Analysis – Typical Weekday	101
Table 9–10 Near-Term Freeway Mainline Segment Operations – Typical Weekday	102
Table 10–1 Existing + Project Intersection Operations – Typical Weekday During Fair	104
Table 10–2 Existing + Project Street Segment Operations – During Fair (Weekday)	108
Table 10–3 Near-Term Intersection Operations During Fair	111
Table 10–4 Near-Term Street Segment Operations – During Fair (Weekday)	115
Table 11–1 Existing + Project Intersection Operations – During Horse Races	118
Table 11–2 Existing + Project Street Segment Operations – During Horse Races (Weekday)	121
Table 11-3 Via De La Valle Existing + Project Peak Hour Arterial Analysis – During Horse Races Weekday	122
Table 11–4 Existing + Project + Cumulative Projects Intersection Operations – During Horse Races	126
Table 11–5 Near-Term Street Segment Operations – During Horse Races (Weekday)	129
Table 11-6 Near-Term Peak Hour Arterial Analysis – During Horse Races Weekday	130
Table 12–1 Year 2035 Intersection Operations	135
Table 12–2 Long-Term Street Segment Operations	138
Table 12–3 Year 2035 Without Project Freeway Mainline Segment Operations	139
Table 12–4 Long-Term Metered Ramps Operations	140
Table 12–5 Via De La Valle Year 2035 + Project Peak Hour Arterial Analysis – Typical Weekday	141
Table 12–6 Year 2035 + Project Freeway Mainline Segment Operations	142
Table 13–1 Near-Term Intersection Operations With Alternate Project Distribution – During Fair	146
Table 13–2 Existing + Project Intersection Operations – During Horse Races	148
Table 13–3 Existing + Project + Cumulative Projects Intersection Operations – During Horse Races	149
Table 14-1 Lomas Santa Fe Drive Corridor Study Near-Term Intersection Operations at the Highway 101 / Lomas Santa Fe Drive Intersection	152
Table 14-2 Lomas Santa Fe Drive Corridor Study Long-Term Intersection Operations at the Highway 101 / Lomas Santa Fe Drive Intersection	153
Table 18–1 Estimated During Construction Trip Generation	161
Table 19–1 Existing + Project Intersection Mitigation Analysis – Typical Weekday / Weekend	167

LIST OF TABLES (CONTINUED)

SECTION—TABLE #	PAGE
Table 19–2 Existing + Project Intersection Mitigation Analysis – Fair	168
Table 19–3 Existing + Project Intersection Mitigation Analysis – Horse Races	169
Table 19–4 Existing + Project + Cumulative Projects Intersection Mitigation Analysis – Typical Weekday / Weekend	170
Table 19–5 Existing + Project + Cumulative Projects Intersection Mitigation Analysis – Fair	171
Table 19–6 Existing + Project + Cumulative Projects Intersection Mitigation Analysis – Horse Races	172
Table 19–7 Long-Term Mitigation Analysis - Intersections	174
Table 19–8 Queuing Analysis: Highway 101 / Via de La Valle – PM Peak Hour	179
Table 19–9 Queuing Analysis: Via de La Valle / Jimmy Durante Boulevard – AM Peak Hour	180

TRANSPORTATION IMPACT ANALYSIS

MARISOL

Del Mar, California
December 11, 2019

1.0 INTRODUCTION

This transportation analysis has been prepared to determine and evaluate the traffic impacts of developing the Marisol Project. The proposed Project is located south of Border Avenue and west of Camino Del Mar, in the northwestern corner of the City of Del Mar. The proposed project will include a multiple-building resort complex including 65 resort guest rooms and up to 27 attached villas, 4 detached villas, 22 affordable units.

Various intersections, segments, freeway mainline segments and ramp meters within the study area will be analyzed to determine Project related impacts, as set forth in the following sections.

- Project Description
- Existing Conditions Description
- Study Area, Analysis Approach and Methodology
- Significance Criteria
- Analysis of Existing Conditions
- Cumulative Projects
- Trip Generation/Distribution/Assignment
- Analysis of Near-Term Scenarios – Typical Periods
- Analysis of Near-Term Scenarios – During Fair
- Analysis of Near-Term Scenarios – During Horse Races
- Analysis of Long-Term Scenarios
- Project Access
- Pedestrian, Bike, Transit Assessment
- Significance of Impacts and Mitigation Measures

2.0 PROJECT DESCRIPTION

2.1 Project Location

The project site is located south of Border Avenue and west of Camino Del Mar, in the northwestern corner of the City of Del Mar. The site comprises eight parcels, seven of which are vacant. A one-story 5,800 square foot residence (with accessory garage structure and pool cabana building) is located on the most southern parcel of the project site.

The Plan Area comprises eight parcels, seven of which are vacant (APNs 298-241-06, 07, 29, -34, -35, and -36, and 299-030-14 and –15) as shown on the aerial photo on the next page. As of 2018, the Plan Area is mostly disturbed, vacant land with a 5,800-square-foot residence remaining on the most southern parcel of the Plan Area with an accessory garage structure and pool cabana building (APN 299-030-1500).

The Plan Area is bordered by high-density residential and Border Avenue to the north, Camino del Mar and floodway to the east, floodway and North Beach to the south, and the Pacific Ocean to the west. Other nearby uses include the Del Mar Fairgrounds, the San Dieguito Lagoon and River, and single-family and multi-family housing south of the San Dieguito Lagoon overpass. The Plan Area totals approximately 22.83 acres.

The project area (also known as specific plan area) includes approximately 17.41 acres located south of Border Avenue and Via de la Valle and mostly west of Camino Del Mar, in the northwestern corner of the City of Del Mar. Assessor's Parcel Numbers include 298-241-06, 07, 29, 34, 35, 36, and 299-030-14 and 15. The project area also includes an isolated parcel on the east side of Camino Del Mar, Assessor's Parcel Number 298-241-07; no development is proposed on this portion of the project area. Additionally, the project area includes Camino del Mar public right-of-way easterly and adjacent to the site, and a City coastal viewing access easement (Assessor's Parcel Number: 298-241-18) located at the northern extent of the project site. Therefore, the area includes a total of nine parcels, seven of which are vacant. A one-story, 5,800 square foot residence (with accessory garage structure and pool cabana building) is located on the most southern parcel of the project site (Assessor's Parcel Number: 299-030-15).

2.2 Project Description

The project consists of a Specific Plan to allow for visitor-serving accommodations and associated amenities, as outlined in ***Table 2-1***.

The Specific Plan allows for the development of 65 hotel guest rooms, 31 villas (27 of which may be divisible into additional hotel guest rooms when not in use by their owners, for a maximum of 146 hotel guest rooms), 22 affordable housing units, 10 family-friendly, low-cost visitor serving accommodations, and 408 off-street parking spaces, 27 of which shall be made available to the general public. The visitor serving use will include restaurants and a bar and lounge, which will be open to the public, as well as the provision of community meeting space. Amenities also include a spa and a walking trail along the bluff and circumference of the site.

TABLE 2-1
PROPOSED LAND USES

Land Use	Units [a]	Square Feet (SF) / Acreage [a]
Visitor-Serving Accommodations (VSA)	N/A	11.80 Acres
Hotel Guest Rooms [b]	65 [b]	61,000 SF
Hotel Amenities [c]	N/A	8,900 SF [c]
Ancillary Commercial Retail	N/A	19,200 SF
Special Event Space, Meeting Space [d]	N/A	14,300 SF
Back of House Facilities	N/A	32,000 SF
Lower-Cost Shared Visitor-Serving Accommodations [e]	10 [e]	6,800 SF [e]
Attached / Detached Villas [f]	31 [f]	158,400 SF [f]
Villa Amenities	N/A	13,200 SF
Affordable Housing	22	16,100 SF
Parkland/Passive Open Space (PPOS)	N/A	3.07 acres
Public Recreational Area	N/A	1.69 miles of trails [g]
Coastal Bluff Protection Area (CBPA)	N/A	1.21 Acres
Steep Slope Protection Area (SSPA)	N/A	1.37 Acres
City Right-of-Way Areas [h]	N/A	0.90 Acres
Total Privately-Owned Acreage	—	16.55 Acres
Total Plan Area Acreage	—	17.45 Acres

Footnotes:

a. The acreages listed for each land use sub-designation (VSA, PPOS, CBPA and SSPA) are as shown on Figure 3-1, Land Use Plan. The square footage and unit count for associated uses are approximate and may be revised during the review of the design review permit and coastal development permit, provided the project totals do not exceed the maximum FAR allowed by this Specific Plan.

b. Some of the villas (27 of the 31) may be divisible into additional hotel guest rooms when not in use by owners as described in Section 3.3.N and footnote no. 6 below. Therefore, the total number of guestrooms may be a maximum of 146.

c. Includes specialty restaurant, bar/lounge, restaurant, pool bar, and retail. Does not include outdoor amenity space.

d. Meeting space shall be made available free of rental charge to the City, City-affiliated organizations, and bona fide non- profit groups for no less than 10 events per year on a first-come, first-served basis subject to space availability for the time requested.

e. Alternatively, the low-cost visitor-serving accommodations requirement may be met, subject to approval by the Coastal Commission, via payment of in lieu fees to be used for construction of low-cost visitor-serving accommodations in another location within the City of Del Mar.

f. When not occupied by their owners, 27 of the 31 villas may be divisible into 3 units each for an additional 81 hotel guest rooms. The remaining 4 Villas are detached villas.

g. Includes 0.19 miles of existing trails and 1.50 miles of new trails.

h. The City right-of-way areas are included in the SSPA and PPOS land use sub-designations.

General Note:

N/A – Not Applicable

The attached Villas are single ownership and "resort - branded", i.e. they may be available for rent by the resort when the owner is not there. In reality, the attached Villas will accommodate many folks that do not live year-round on-site and do not go to work each day during peak commuter periods. Even if these villas are rented, they may remain unoccupied for extended periods of time, since like any hotel, 100% occupancy is not guaranteed. It is believed that assuming a 100% occupancy means overstating the number of trips generated by the attached Villas, particularly during peak hours.

Ancillary commercial retail uses are subordinate in area, extent, and purpose to the principal visitor-serving accommodation use and contribute to the comfort, convenience, or necessity of occupants or visitors of the principal visitor-serving accommodation use. Examples of ancillary commercial uses include, but are not limited to, convenience and specialty shopping facilities, gift shops, art galleries, snack shops, recreation and spa facilities, and beach-equipment rental operations.

Lower-Cost Shared Visitor-Serving Accommodations are overnight accommodations that will provide lower-income members of the public, including those that live farther from the coast, access and recreation opportunities at the coast. Consistent with the California Coastal Act's requirement to maximize access and promote lower-cost visitor and recreational facilities, the Lower-Cost Shared Visitor-Serving Accommodations will provide opportunities for individuals and families from underserved communities to visit the coast when they might not be able to do so otherwise due to costs, including costs for overnight accommodations.

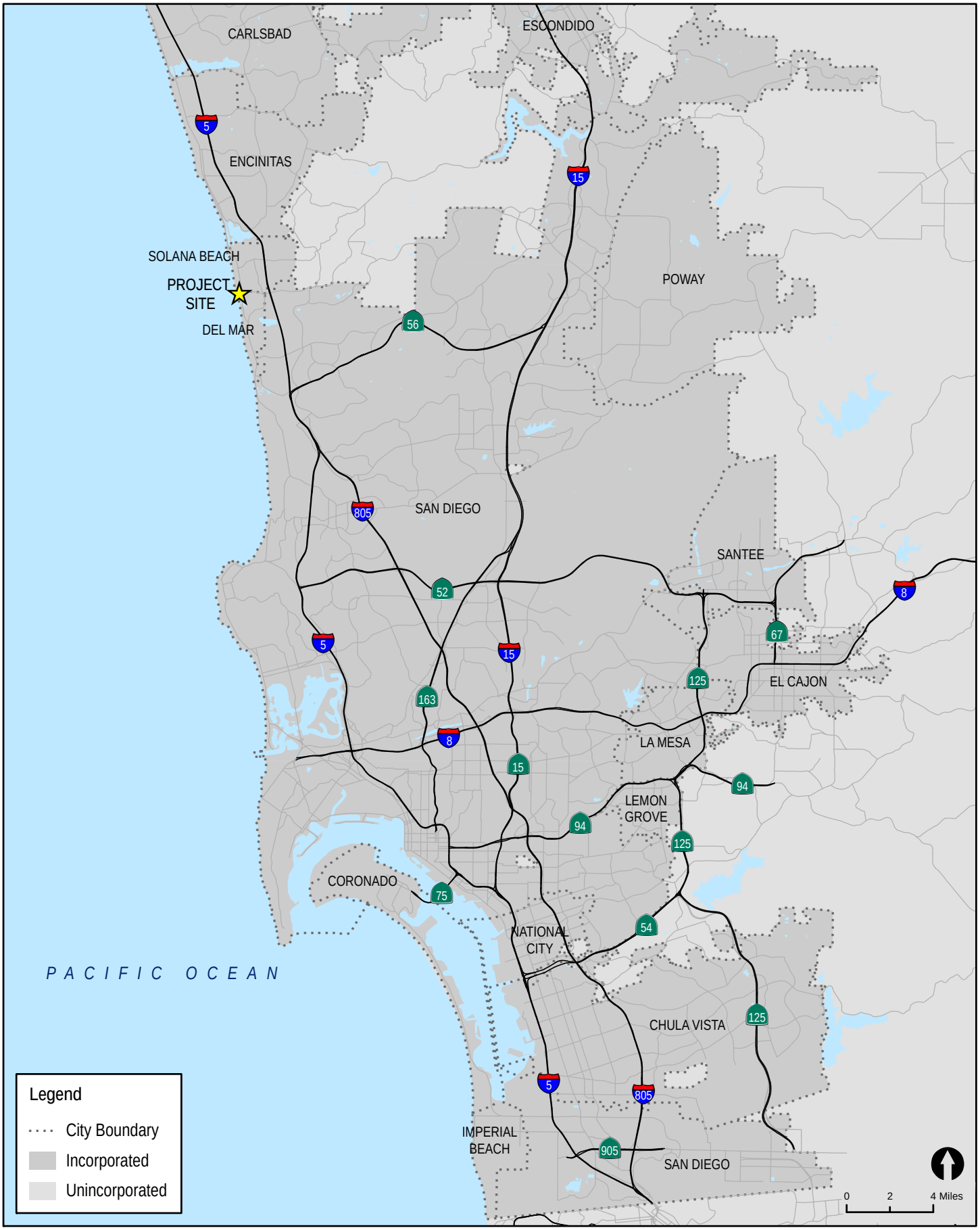
Affordable Housing Units are for-rent housing units reserved at rental rates affordable to persons or households that qualify as being of extremely-low income, very-low income, and low income based on the area median income for San Diego County, as adopted and as may be amended by time to time, by the California Department of Housing and Community Development, pursuant to state law.

2.3 Project Access

Access to the proposed project would be provided via Border Avenue near the intersection of Border Avenue and S. Sierra Avenue. Outbound access from the Project to Sierra Avenue will be prohibited.

Figure 2–1 is the Project Vicinity map while ***Figure 2–2*** is the Project Area Map. ***Figure 2–3*** depicts the Conceptual Site Plan.

CITY OF SOLANA BEACH
CITY OF DEL MAR
29824033
29824039
29824024
101
29842032
BORDER AVE
VIA DE LA VALLE
29824118
VACANT
29824134
VACANT
29824129
VACANT
VACANT
29824135
VACANT
29824106
VACANT
29824107
29824107
29903014
VACANT
29903015
5,800 SF RESIDENCE
29903016
CAMINO DEL MAR
29903009
29903007
29903008
76014528/ 29842033
80142862
0 100 200 Feet
Del Mar Specific Plan Area
Top of Bluff
Parcels Owned by the City of Del Mar



LINSCOTT LAW & GREENSPAN engineers

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Date: 11/07/19

Figure 2-1

Vicinity Map

MARISOL

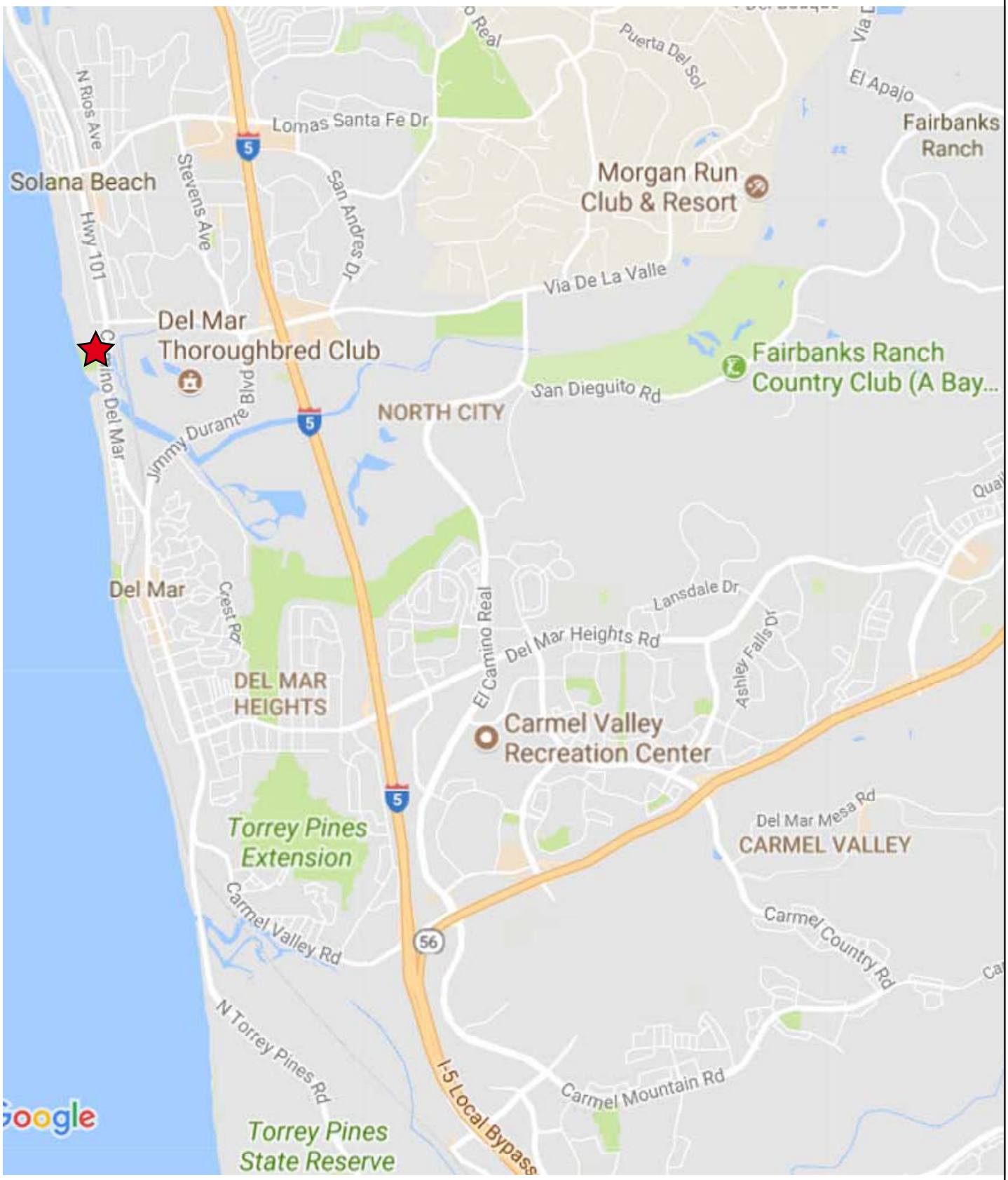

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Figure 2-2

Project Area Map

MARISOL

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Date: 11/07/19

Figure 2-3

Site Plan

MARISOL

3.0 EXISTING CONDITIONS

Effective evaluation of the traffic impacts associated with the proposed Project requires an understanding of the existing transportation system within the project area. ***Figure 3–1*** depicts the existing conditions, including signalized intersections and lane configurations.

3.1 Existing Street Network

The following is a description of the existing street network in the study area.

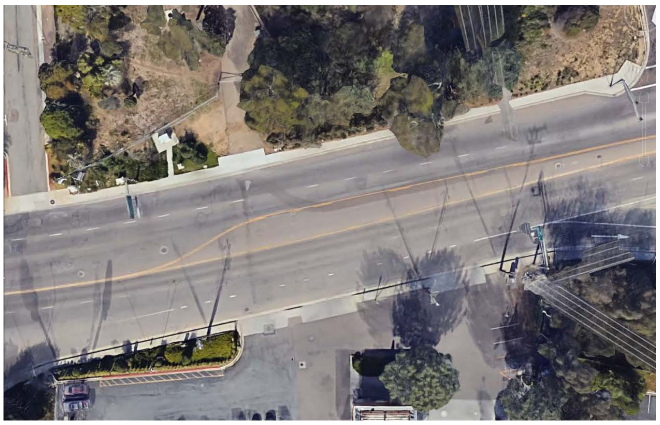
Via De La Valle

Via De La Valle provides inland and beach access, as well as interregional access via an interchange with I-5. Via De La Valle also provides direct access to the Del Mar Fairgrounds, a major seasonal traffic generator.

Via De La Valle is an east-west street. West of Jimmy Durante Boulevard, Via De La Valle is located within the City of Del Mar and is currently built as a two-lane road with a center two-way-left-turn lane between Jimmy Durante Boulevard and Highway 101. Curb, gutter and sidewalk are provided. Additional through lanes / turn lanes are provided at the Jimmy Durante Boulevard and Highway 101 intersections. Bike lanes and bike buffers are provided along Via De La Valle. The posted speed limit is 45 mph. Curbside parking is permitted along the entire southern curb and most of the way on the north curb between Highway 101 and the Jimmy Durante Boulevard.

To the east of Jimmy Durante Boulevard, Via De La Valle is primarily located within the City of San Diego. Between Jimmy Durante Boulevard and I-5, Via De La Valle is a four-lane roadway. On-street parking is not permitted and bike lanes are not provided.

The photo below left shows the section of Via De La Valle east of Jimmy Durante Boulevard and the photo below right shows the section of Via De La Valle west of Jimmy Durante Boulevard.



Highway 101

The section of Highway 101 between north of Lomas Santa Fe Drive and Via De La Valle is a four-lane major arterial. It provides the primary north-south access to numerous beaches and parks along the coast as well as connections to the communities of Encinitas, Carlsbad and Oceanside to the north and Del Mar and La Jolla to the south. Highway 101 is also a popular route for bicyclists. In 2013 a City revitalization project made significant improvements to Highway 101. The Highway 101 West Side Improvement project includes an increase in the number of parking spaces, creation of a bicycle and pedestrian friendly corridor, improvements to the aesthetics of the surrounding area, traffic calming along Highway 101, installation of two new traffic signals and two new mid-block crosswalks.

The photo below left depicts Highway 101 just north of Via De La Valle and the photo above right depicts Camino Del Mar, south of Via De La Valle.

Camino Del Mar

Camino Del Mar is generally a two-lane road with a raised / landscaped median. The northern section up to 600 feet south of Via De La Valle is built as a four-lane Major Road with a raised median. Curb, gutter and sidewalk are provided. Bike lanes are also provided. The posted speed limit is 30 mph. curbside parking is permitted on the west curb up to the bridge and continues on both curbs south of the bridge.

The photo on the next page depicts the section of Camino Del Mar south of Via de La Valle. As seen in the photo, a buffer is provided between the bike lane and the curbside parking.

Sierra Avenue

Sierra Avenue is parallel to and west of Highway 101. It is a two-lane roadway with a posted speed limit of 25 mph. Although there is no designated bicycle facility along this roadway, it is regularly used by bicyclists as it provides a strong north-south connection parallel to Highway 101 with lower vehicular traffic volumes.

The photo below depicts S. Sierra Avenue north of Border Avenue.

Border Avenue

The west leg of the Highway 101 / Via De La Valle intersection is Border Avenue. It is a short road between Highway 101 and S. Sierra Avenue and is within the jurisdiction of the City of Del Mar. It is a two-lane roadway with parking permitted on both curbs. Although there is no designated bicycle facility along this roadway, it is regularly used by cyclists as it provides a strong north-south connection parallel to Highway 101 with lower vehicular traffic volumes.

Lomas Santa Fe Drive

Lomas Santa Fe Drive runs east-west and is a four-lane divided roadway with limited on-street parking. It provides coastal and inland access for Solana Beach and access to and from I-5. Posted speeds are 35 mph. A bike lane is striped on both sides of the street. The existing functional classification of Lomas Santa Fe Drive is a four-lane major roadway.

Cedros Avenue

Cedros Avenue is parallel to and east of Highway 101 and is within the jurisdiction of the City of Solana Beach. It is a two-lane roadway with a posted speed limit of 25 mph. The primary function of Cedros Avenue is to provide local access to businesses and residences adjacent to the roadway. It should be noted that South Cedros Avenue between Marsolan Avenue and Via De La Valle is fronted entirely by residential properties. There are bicycle sharrows along Cedros Avenue. The existing functional classification of Cedros Avenue is a two-lane collector roadway.

3.2 Existing Bicycle Network

Currently, bike lanes are provided along both curbs of Via De La Valle and Highway 101 / Camino Del Mar within the project study area.

3.3 Existing Pedestrian Conditions

Continuous sidewalks are provided along both sides of S. Sierra Avenue, Border Avenue, Via De La Valle and Highway 101. Sidewalks are provided along the entire west side of Camino Del Mar, Ion the east side, sidewalks are provided for most of the length of Camino De Mar except for a portion north of 29th Street.

3.4 Existing Transit Conditions

Two NCTD Breeze routes, 101 and 308 run along Highway 101. Route 101 runs between Oceanside and V.A./UCSD via Highway 101. The schedule indicates that the route runs once every half-an-hour.

Route 308 runs between Solana Beach and Escondido via Del Dios Highway. The terminus in Solana Beach is located on Highway 101, just south of Lomas Santa Fe Drive. The schedule indicates that the route runs hourly, with the first bus leaving Escondido at around 5:00 AM and the last at around 7:30 PM.

3.5 Existing Traffic Volumes

The proposed Project is located adjacent to the Del Mar Fairgrounds and the Fairgrounds related activities greatly affect traffic patterns in the area. The main two activities at the Fairgrounds are the Del Mar Fair and the Horse Races. Therefore, the schedule of activities was reviewed and based on discussions with the City, it was decided to analyze the following scenarios:

1. A Typical Weekday
2. A Typical Weekend day
3. A Weekday During the Fair

4. A Weekend day During the Fair
5. A Weekday During the Horse Races
6. A Weekend day During the Horse Races

The schedule of events at the Fairgrounds is included in ***Appendix A***.

Gates open at nine AM most days during the fair and at noon most days during the Horse Races. Thus, only PM peak hour counts were conducted on a weekday during the Fair and Horse Races. The schedule of events at the Fair and Horse Races is included in *Appendix A.*

3.5.1 *Pear Hour Intersection Volumes*

Manual hand counts at the study area intersections, including bicycle and pedestrian counts, were conducted. ***Table 3-1*** summarizes the dates and times the existing counts were conducted on a typical weekday and weekend, as well as on a weekday with the Del Mar Fair.

Appendix A also contains the signal timing plans for all signalized intersections obtained from the Cities of Del Mar and Solana Beach.

3.5.2 *Daily Segment Volumes*

Table 3–2 summarizes the dates and times of the existing segment counts during the three times of the year and the average daily traffic volumes (ADTs). Segment analysis was conducted on weekdays, but not on weekend days since street segment analysis uses roadway capacities that are calculated assuming typical commuter peak hours and the spread of traffic throughout the day assuming workday travel patterns. Weekends do not have commuter peak periods. For this reason, it is the standard of practice in traffic engineering to not conduct segment analysis during weekend days.

Intersection and segment count sheets are included in *Appendix A*.

3.5.3 *Freeway Mainline and Metered on-Ramp Volumes*

Weekday freeway mainline and metered on-ramp volumes were obtained from the PeMs website for the various conditions. *Appendix A* contains the manual count sheets, Truck and K&D factors.

TABLE 3–1
INTERSECTION COUNTS

Intersections	Typical		Fair		Horse Races	
	Weekday	Weekend	Weekday	Weekend	Weekday [a]	Weekend
1. Hwy 101 / Lomas Santa Fe Dr	Thu 6/1/17	Sat 7/15/17	Tue 6/27/17	Sat 6/8/2019	Tue 7/25/17	Sat 7/22/17
2. Lomas Santa Fe Dr / Cedros Avenue	Tue 7/18/17	Sat 7/15/17	[b]	[b]	Tue 7/25/17	Sat 7/22/17
3. Lomas Santa Fe Dr / I-5 SB Ramps	Tue 7/18/17	Sat 7/15/17	[b]	[b]	Tue 7/25/17	Sat 7/22/17
4. Lomas Santa Fe Dr / I-5 NB Ramps	Tue 7/18/17	Sat 7/15/17	[b]	[b]	Tue 7/25/17	Sat 7/22/17
5. Dahlia Dr / S Sierra Ave	Tue 7/18/17	Sat 7/15/17	[b]	[b]	Tue 7/25/17	Sat 7/22/17
6. Dahlia Dr / Highway 101	Thu 6/1/17	Sat 7/15/17	Tue 6/27/17	Sat 6/8/2019	Tue 7/25/17	Sat 7/22/17
7. Border Ave /S. Sierra Ave	Thu 5/4/17	Sat 7/15/17	Tue 6/27/17	Sat 6/8/2019	Tue 7/25/17	Sat 7/22/17
8. Hwy 101 (Camino Del Mar) / Via De La Valle (Border Ave)	Thu 5/4/17	Sat 7/15/17	Tue 6/27/17	Sat 6/8/2019	Tue 7/25/17	Sat 7/22/17
9. Via De La Valle / S. Cedros Ave	Thu 5/4/17	Sat 7/15/17	Tue 6/27/17	Sat 6/8/2019	Tue 7/25/17	Sat 7/22/17
10. Via De La Valle / Jimmy Durante Blvd	Wed 5/17/17	Sat 7/15/17	Tue 6/27/17	Sat 6/8/2019	Tue 7/25/17	Sat 7/22/17
11. Via De La Valle / I-5 SB Ramps	Thu 6/1/17	Sat 7/15/17	Tue 6/27/17	Sat 6/8/2019	Tue 7/25/17	Sat 7/22/17
12. Via De La Valle / I-5 NB Ramps	Thu 6/1/17	Sat 7/15/17	Tue 6/27/17	Sat 6/8/2019	Tue 7/25/17	Sat 7/22/17
13. Camino Del Mar / 27th St	Thu 6/1/17	Sat 7/15/17	Tue 6/27/17	Sat 6/8/2019	Tue 7/25/17	Sat 7/22/17
14. Camino Del Mar / Coast Blvd	Thu 6/1/17	Sat 7/15/17	Tue 6/27/17	Sat 6/8/2019	Tue 7/25/17	Sat 7/22/17
15. Camino Del Mar / L'Auberge Del Mar	Tue 7/18/17	Sat 7/15/17	[b]	[b]	Tue 7/25/17	Sat 7/22/17
16. Camino Del Mar / 15th St	Thu 5/4/17	Sat 7/15/17	Tue 6/27/17	Sat 6/8/2019	Tue 7/25/17	Sat 7/22/17
17. Camino Del Mar / Del Mar Heights Rd	Tue 7/18/17	Sat 7/15/17	[b]	[b]	Tue 7/25/17	Sat 7/22/17
18. Camino Del Mar / Carmel Valley Rd	Tue 7/18/17	Sat 7/15/17	[b]	[b]	Tue 7/25/17	Sat 7/22/17
19. Via De La Valle / Solana Cir				[b]		

Footnotes:

a. Only PM peak hour counts were conducted since the horse races do not begin until 2:00 PM.

b. Counts were not conducted.

General Note:

All counts were conducted during the current year (2017).

TABLE 3–2
EXISTING WEEKDAY TRAFFIC VOLUMES

Street Segment	Typical Weekday [a]		Fair [b]		Horse Races [c]	
	ADT [c]	Date [d]	ADT [c]	Date	ADT [c]	Date
S. Sierra Avenue						
Del Mar Shore Ter to Beach Club Dr	3,400	May 03	3,500	Jun 27	4,300	Jul 25
Highway 101						
Lomas Santa Fe Dr to Dahlia Dr	15,000	May 31	18,700	Jun 28	19,400	Jul 25
Dahlia Dr to Via De La Valle	17,900	May 03	19,000	Jun 28	20,400	Jul 25
Camino Del Mar						
Via De La Valle to 27th St	15,300	May 03	17,700	Jun 28	16,900	Jul 25
27th St to Coast Blvd	10,900	May 31	16,800	Jun 28	18,500	Jul 25
Coast Blvd to Jimmy Durante Blvd	8,900	May 31	11,300	Jun 28	12,800	Jul 25
Via De La Valle						
Highway101 (Camino Del Mar) to S. Cedros Ave	16,500	May 03	15,600	Jun 28	18,500	Jul 25
S. Cedros Ave to Jimmy Durante Blvd	18,800	May 03	24,300	Jun 28	23,700	Jul 25
Jimmy Durante Blvd to I-5 SB Ramps	44,200	May 31	58,200	Jun 28	45,200	Jul 25

Footnotes:

a. Traffic volumes with no event at the Del Mar Fairgrounds rounded to the nearest 100.
b. Traffic volumes with a fair at the Del Mar Fairgrounds rounded to the nearest 100.
c. Traffic volumes with horse races at the Del Mar Fairgrounds rounded to the nearest 100.
d. Average Daily Traffic Volumes.
e. All counts were conducted during the current year (2017).

Source: Accurate Video Counts, Inc.

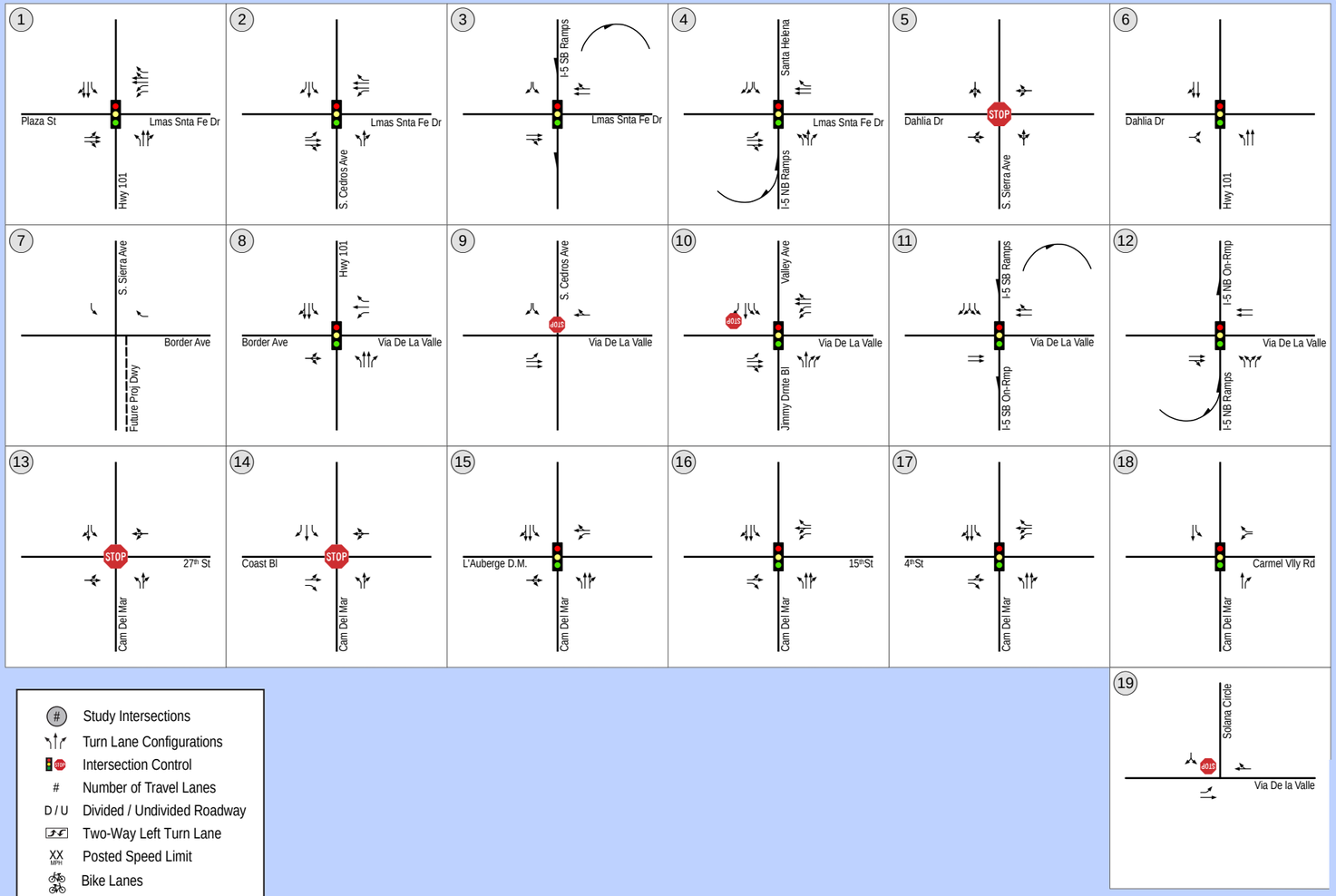


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Figure 3-1

Existing Conditions Diagram

MARISOL

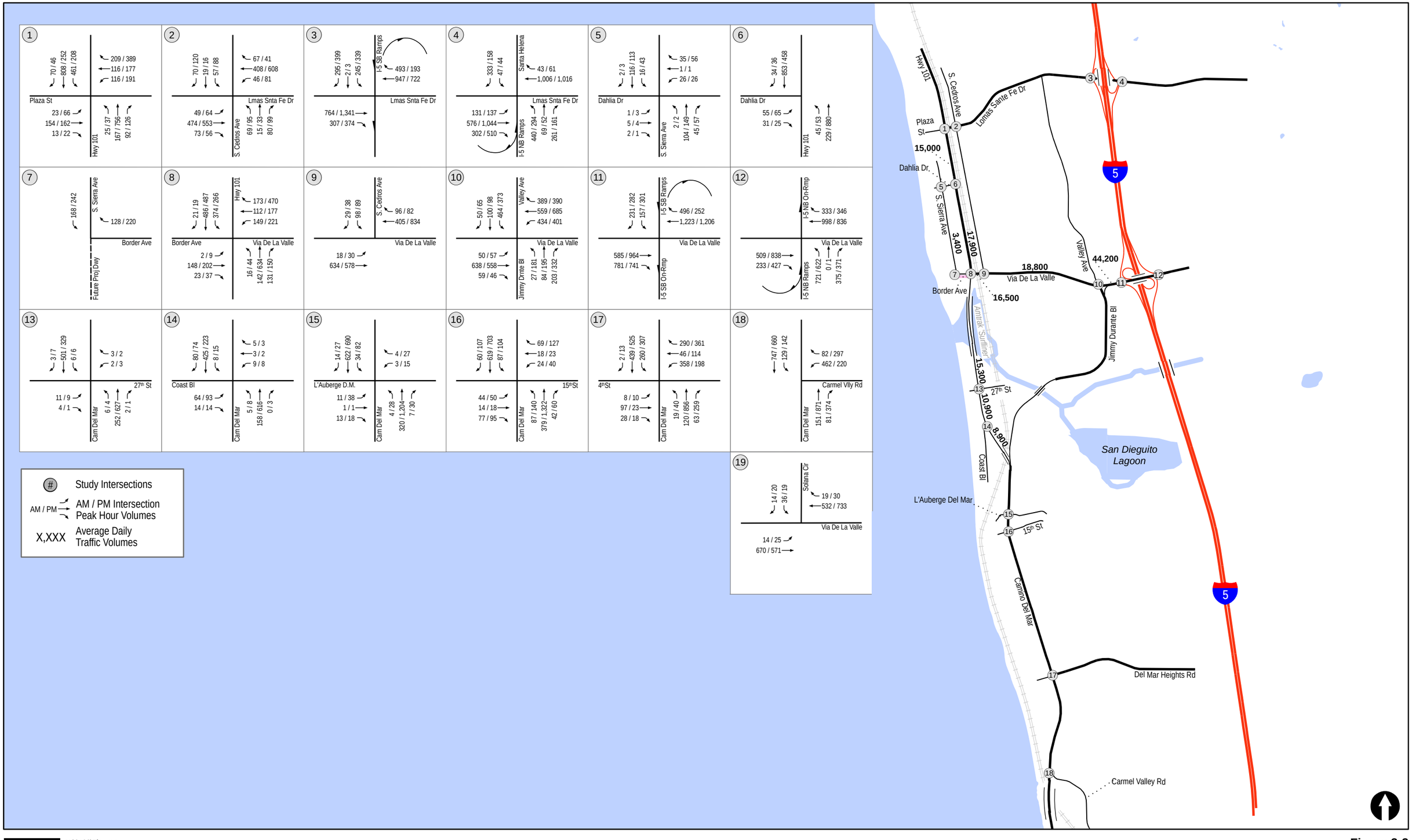

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Figure 3-2

Existing Traffic Volumes

Typical Weekday

MARISOL

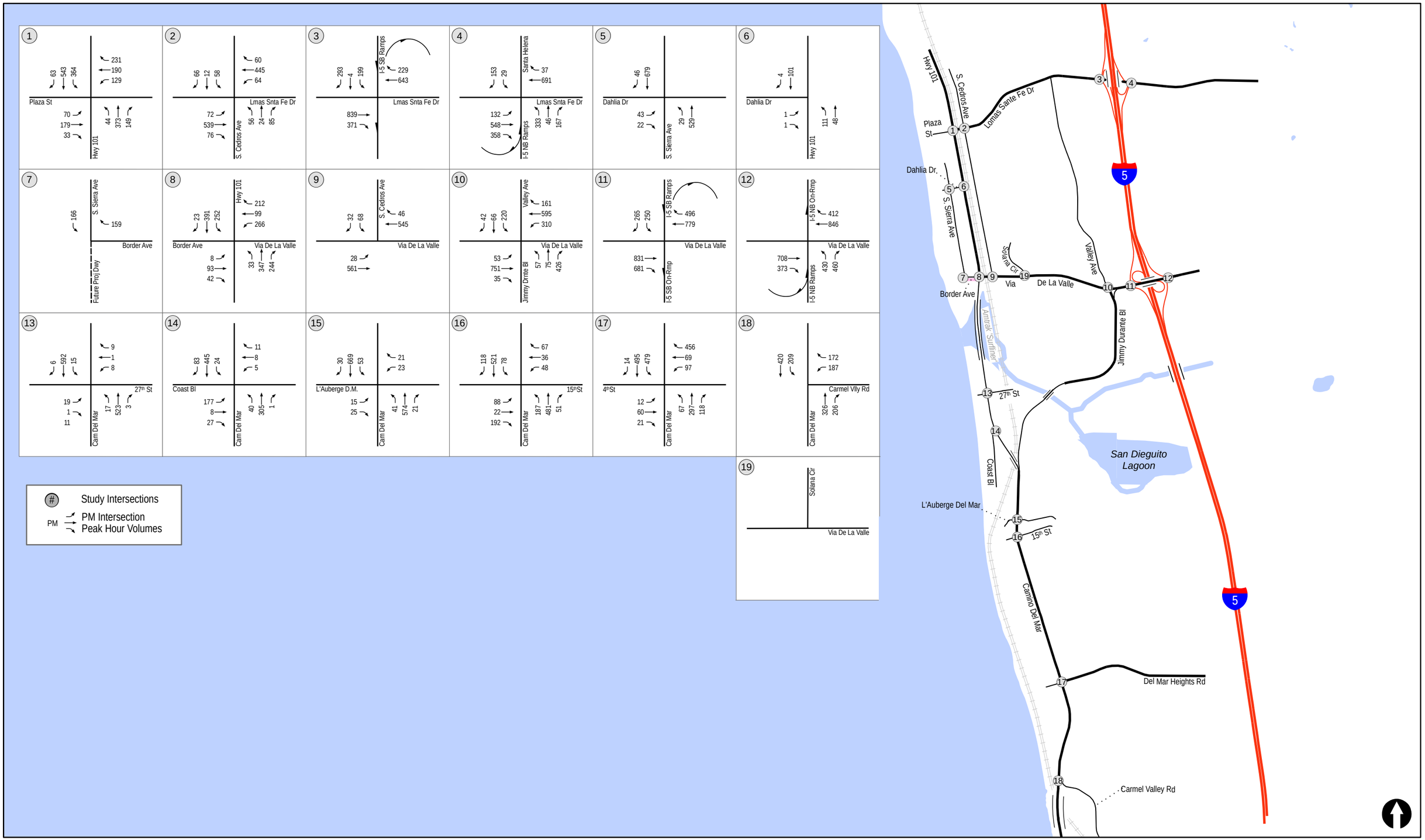

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Figure 3-3

Existing Traffic Volumes

Typical Weekend

MARISOL

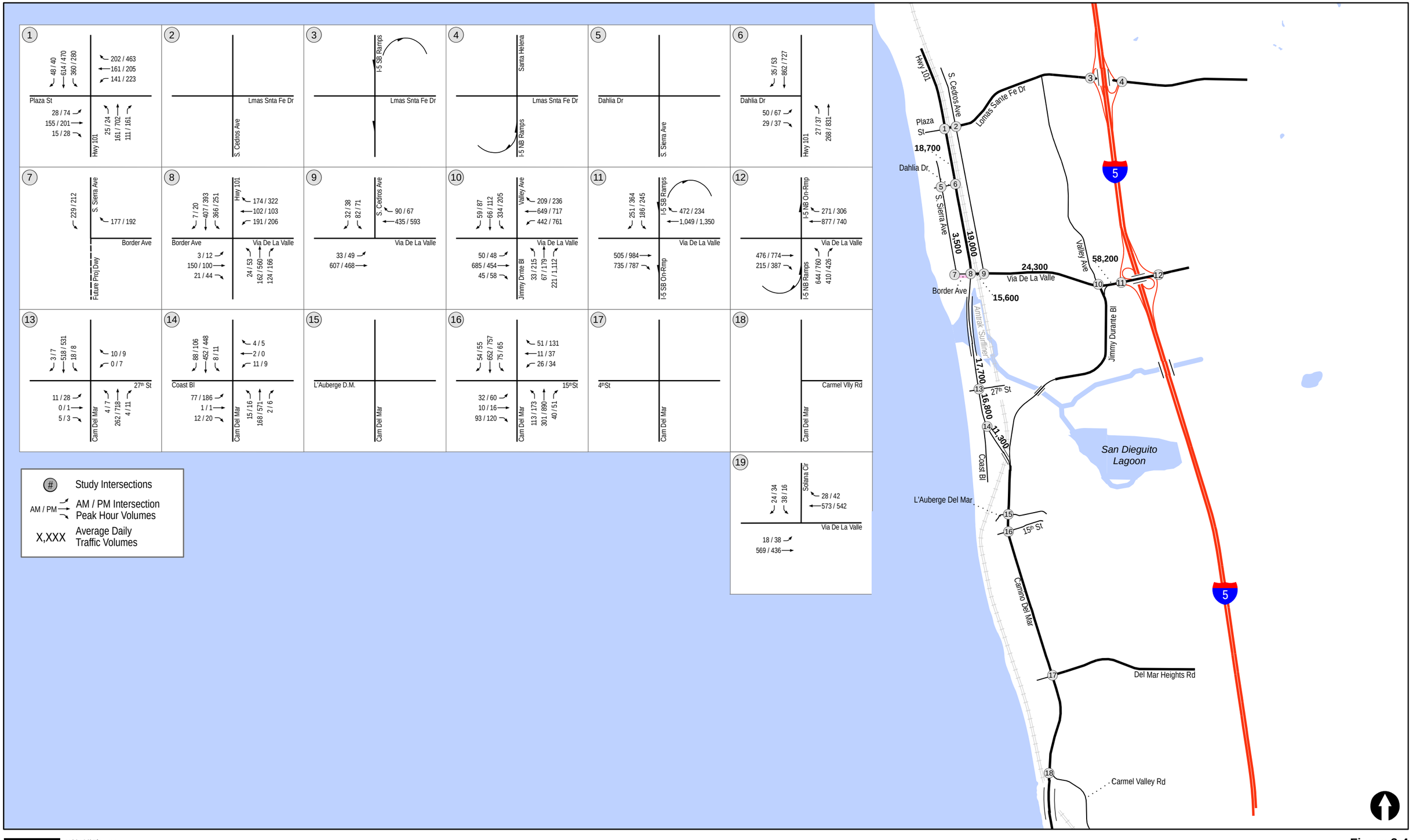

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Figure 3-4

Existing Traffic Volumes

Weekday - During Fair

MARISOL

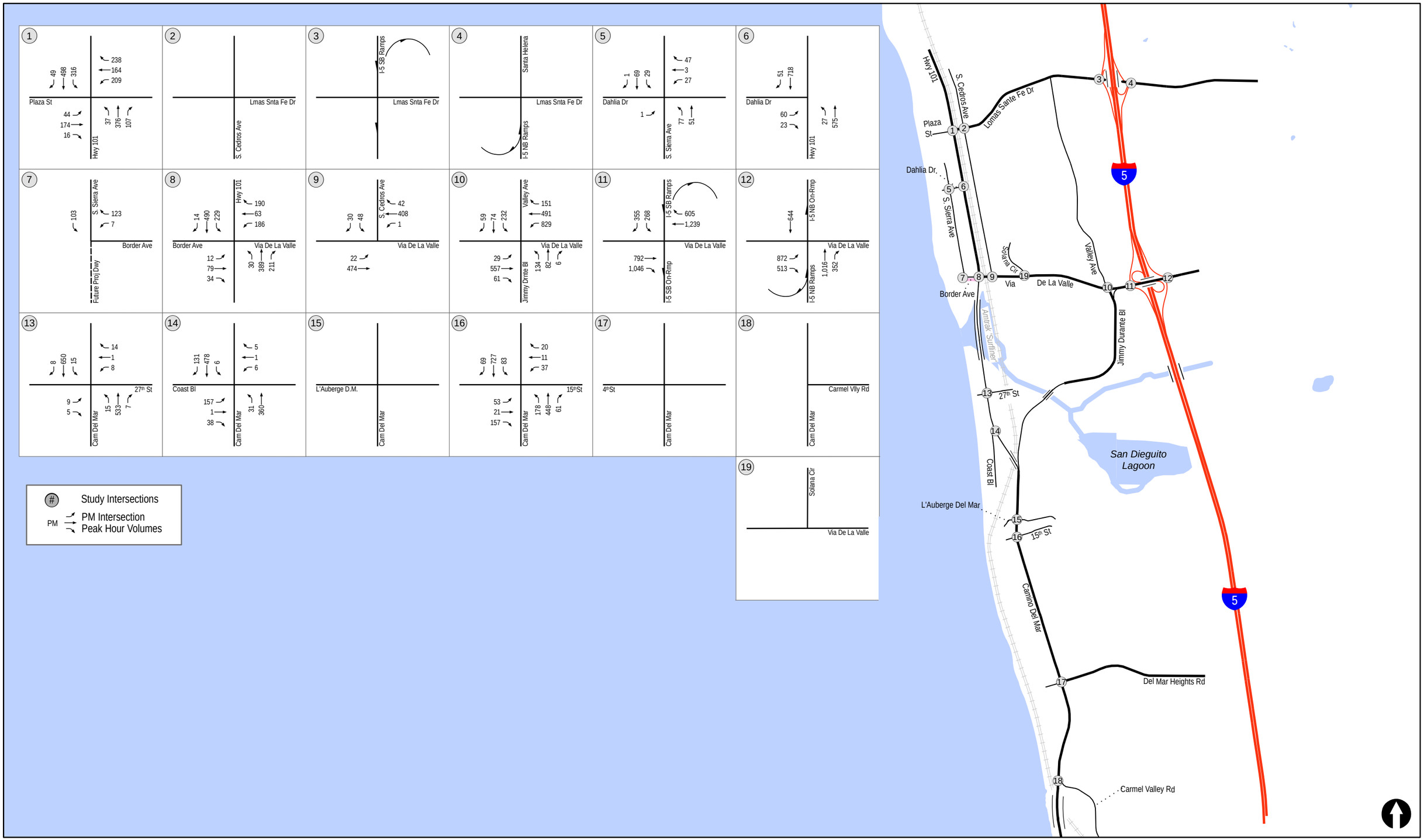

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Figure 3-5

Existing Traffic Volumes

Weekend - During Fair

MARISOL

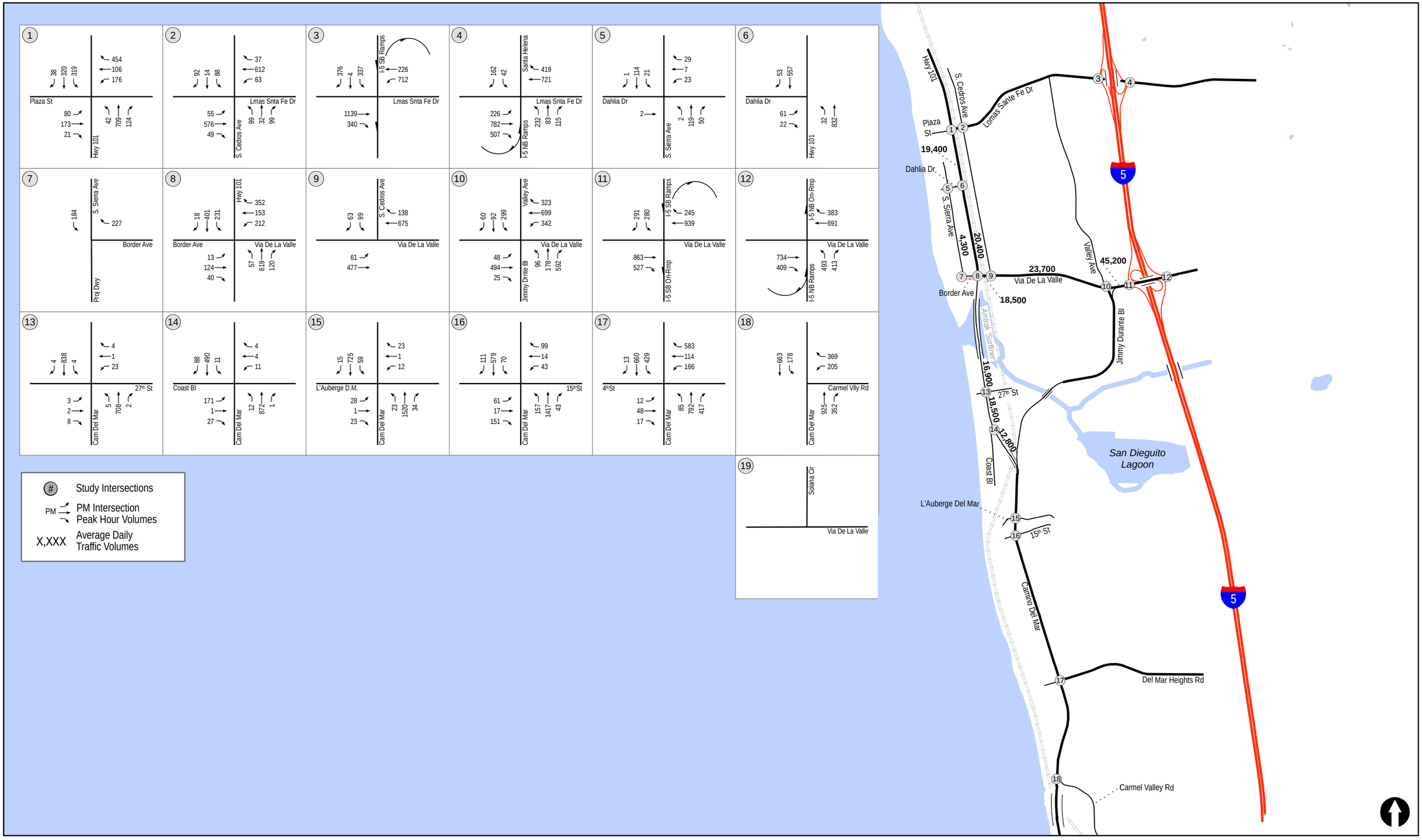

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Figure 3-6

Existing Traffic Volumes

Weekday - During Horse Races

MARISOL

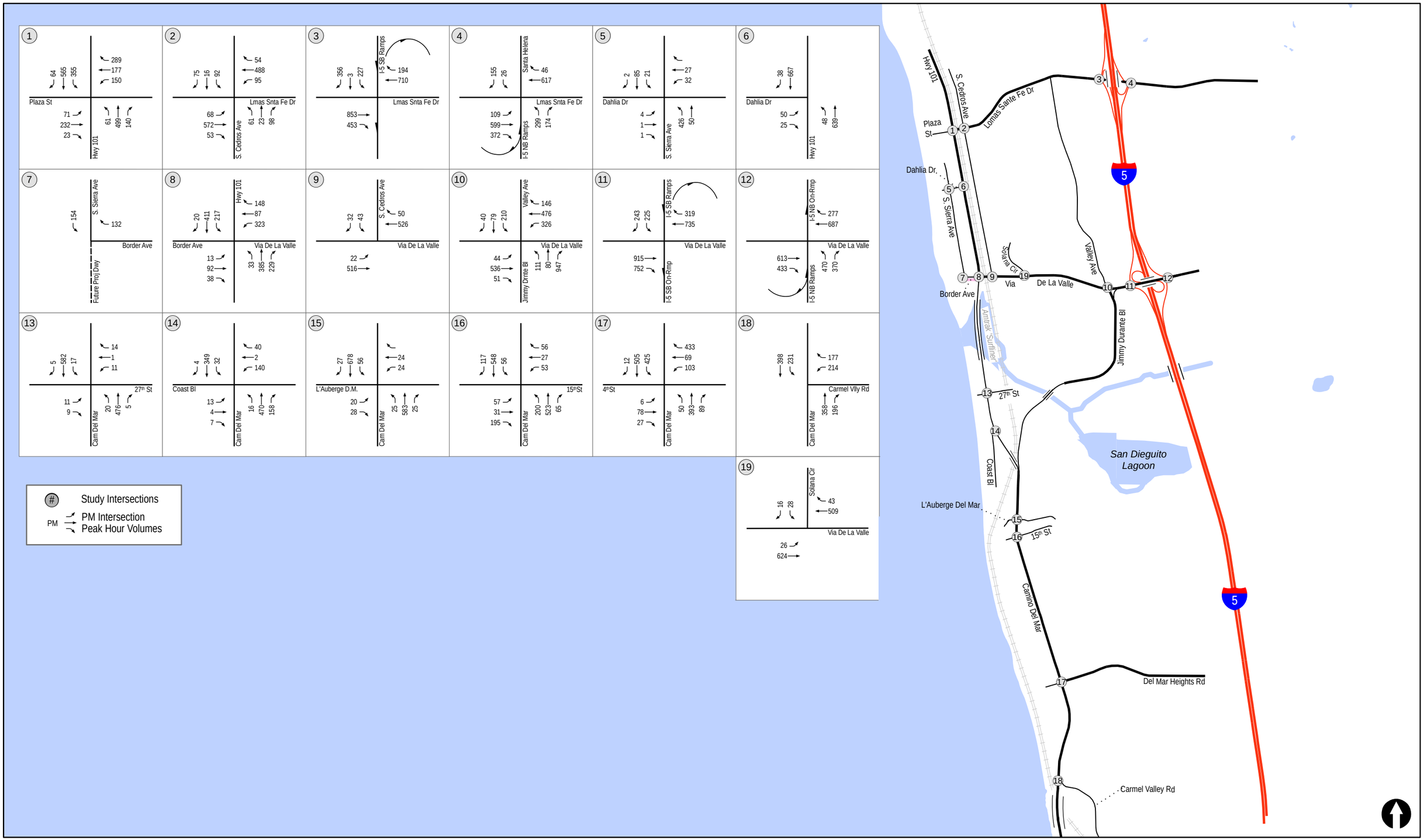

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Figure 3-7

Existing Traffic Volumes

Weekend - During Horse Races

MARISOL

4.0 STUDY AREA, ANALYSIS APPROACH AND METHODOLOGY

4.1 Study Area

4.1.1 *Determining The Project Study Area*

The study area was determined based on the SANTEC/ITE Regional Guidelines for Traffic Impact Studies which require that a Project study area be established as follows:

- Intersections and street segments where the Project will add 50 or more peak hour trips in either direction.
- Mainline freeway locations where the Project will add 50 or more peak hour trips in either direction.
- Metered Freeway Ramps where the Project will add 20 or more peak hour trips.

In addition, the study area locations were selected based on the Project's trip distribution and are the most likely locations to be impacted by Project. The Project study area includes the following locations:

INTERSECTIONS

1. Highway 101 / Lomas Santa Fe Drive
2. Cedros Avenue / Lomas Santa Fe Drive
3. I-5 SB Ramps / Lomas Santa Fe Drive
4. I-5 NB Ramps / Lomas Santa Fe Drive
5. S. Sierra Avenue / Dahlia Drive
6. Highway 101 / Dahlia Drive
7. Border Avenue/S. Sierra Avenue
8. Highway 101 (Camino Del Mar) / Via De La Valle (Border Avenue)
9. Via De La Valle / S. Cedros Avenue
10. Via De La Valle / Jimmy Durante Boulevard
11. Via De La Valle / I-5 SB Ramps
12. Via De La Valle / I-5 NB Ramps
13. Camino Del Mar / 27th Street
14. Camino Del Mar / Coast Boulevard
15. Camino Del Mar / L'Auberge Del Mar
16. Camino Del Mar / 15th Street
17. Camino Del Mar / Del Mar Heights Road
18. Camino Del Mar / Carmel Valley Road
19. Via de la Valle / Solana Circle

SEGMENTS

A. S. Sierra Avenue: Del Mar Shore Terrace to Beach Club Drive
B. Highway 101: Lomas Santa Fe Drive to Dahlia Drive
C. Highway 101: Dahlia Drive to Via De La Valle
D. Camino Del Mar: Via De La Valle to 27th Street

E. Camino Del Mar: 27th Street to Coast Boulevard
F. Camino Del Mar: Coast Boulevard to Jimmy Durante Boulevard
G. Via De La Valle: Highway101(Camino Del Mar) to S. Cedros Avenue
H. Via De La Valle: S. Cedros Avenue to Jimmy Durante Boulevard
I. Via De La Valle: Jimmy Durante Boulevard to I-5 SB Ramps

FREEWAY MAINLINE SEGMENTS

1. **I-5:** Lomas Santa Fe Drive to Via De La Valle
2. **I-5:** Via De La Valle to Del Mar Heights Road
3. **I-5:** Del Mar Heights Road to SR 56

METERED ON-RAMPS

1. Eastbound Via De La Valle / I-5 Southbound on-ramp
2. Eastbound Via De La Valle / I-5 Northbound on-ramp

Consideration was given to including the Lomas Santa Fe Drive intersections at Nardo Avenue and Stevens Avenue within the City of Solana Beach, in the traffic study but based on the computer based Select Zone Analysis (SZA) conducted by SANDAG specifically for this site (Section 8), the project adds fewer than 10 trips to these intersections during the weekday or weekend. This is far below the San Diego Traffic Engineers' Council (SANTEC) threshold of a minimum of 50 peak hour trips to include in a Study Area. Therefore, they were not included for analysis (please see *Figures 8-2 and 8-3*).

4.2 Analysis Scenarios

This study includes analysis of the following scenarios:

- Typical Weekday and Weekend
  - Existing
  - Existing + Project
  - Existing + Cumulative Projects
  - Existing + Cumulative Projects + Project
  - Year 2035 Without Project (Weekday only)
  - Year 2035 + Project (Weekday only)

- During Fair Weekday (Weekday and Weekend)
  - Existing
  - Existing + Project
  - Existing + Cumulative Projects
  - Existing + Cumulative Projects + Project

- During Horse Races Weekday and Weekend
  - Existing
  - Existing + Project
  - Existing + Cumulative Projects
  - Existing + Cumulative Projects + Project

The Del Mar Fairgrounds hosts roughly 52 days of horse races annually. Roads within the study area are therefore affected by the horse races for 14% of the year. The San Diego County Fair at the Del Mar Fair Grounds occurs 26 days out of the year. This represents 7% of the year, when the roads experience an increase in trips due to the fair. On the whole, any impact due to the fair and horse races together lasts for about 78 days in a year or 21% of a year.

4.3 Methodology

There are various methodologies used to analyze signalized intersections, unsignalized intersections, and street segments. The measure of effectiveness for intersection and segment operations is level of service (LOS), which denotes the operating conditions which occur at a given intersection or on a given roadway segment under various traffic volume loads.

LOS is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Levels of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments. In the 2010 Highway Capacity Manual (HCM), Level of Service for signalized intersections is defined in terms of delay. The level of service analysis results in seconds of delay expressed in terms of letters A through F. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

Table 4–1 summarizes the signalized intersections levels of service descriptions. ***Table 4–2*** depicts the intersection LOS and corresponding delay ranges, which are based on overall intersection delay (signalized intersections) and the average control delay for any particular minor movement (unsignalized intersections), respectively. LOS relative to signalized and unsignalized intersection is further described below.

4.3.1 *Signalized Intersections*

For signalized intersections, level of service criteria is stated in terms of the average control delay per vehicle for a 15-minute analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Level of service A describes operations with very low delay, (i.e. less than 10.0 seconds per vehicle). This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

TABLE 4–1
INTERSECTION LEVEL OF SERVICE DESCRIPTIONS

Level of Service	Description
A	Occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
C	Generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.
F	Considered to be unacceptable to most drivers. This condition often occurs with over saturation i.e. when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume-to-capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels

TABLE 4–2
INTERSECTION LOS & DELAY RANGES

LOS	Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10.0	≤ 10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	≥ 80.1	≥ 50.1

Source: 2010 Highway Capacity Manual

Level of service B describes operations with delay in the range 10.1 seconds and 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of Average delay.

Level of service C describes operations with delay in the range 20.1 seconds and 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level of service D describes operations with delay in the range 35.1 seconds and 55.0 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or higher volume (demand) / capacity (v/c) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are frequent.

Level of service E describes operations with delay in the range of 55.1 seconds to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

Level of service F describes operations with delay in excess of over 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation (i.e., when arrival flow rates exceed the capacity of the intersection). It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

4.3.2 *Unsignalized Intersections*

For unsignalized intersections, level of service is determined by the computed or measured control delay and is defined for each minor movement: level of service is not defined for the intersection as a whole. Level of Service F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This level of service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits. LOS F may also appear in the form of side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

4.3.3 *Street Segments*

The Cities of Del Mar and Solana Beach do not provide segment capacity tables. The City of Solana Beach Circulation June 2015 states the “Functional roadway classifications are based on County of San Diego Public Roadway Standards”.

Based on the above, the analysis of the study are intersections and segments within the jurisdiction of the Cities of Del Mar and Solana Beach street segment is based upon the comparison of daily traffic volumes (ADTs) to the County of San Diego's Roadway Classification, Level of Service, and ADT Table. ***Table 4–3*** is the County of San Diego's Average Daily Vehicle Trips table. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics.

TABLE 4–3
AVERAGE DAILY VEHICLE TRIPS – COUNTY OF SAN DIEGO

MOBILITY ELEMENT ROADS			LEVELS OF SERVICE				
Roadway Classification		**#of Travel Lanes**	**A**	**B**	**C**	**D**	**E**
Expressway (6.1)		6	<36,000	<54,000	<70,000	<86,000	<108,000
Prime Arterial (6.2)		6	<22,200	<37,000	<44,600	<50,000	<57,000
Major Road	w/ Raised Median (4.1A)	4	<14,800	<24,700	<29,600	<33,400	<37,000
	w/ Intermittent Turn Lanes (4.1B)	4	<13,700	<22,800	<27,400	<30,800	<34,200
Boulevard	w/ Raised Median (4.2A)	4	<18,000	<21,000	<24,000	<27,000	<30,000
	w/ Intermittent Turn Lanes (4.2B)	4	<16,800	<19,600	<22,500	<25,000	<28,000
Community Collector	w/ Raised Median (2.1A)	2	<10,000	<11,700	<13,400	<15,000	<19,000
	w/ Continuous Left-Turn Lane (2.1B)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	w/ Intermittent Turn Lanes (2.1C)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	w/ Passing Lane (2.1D)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	No Median (2.1E)	2	<1,900	<4,100	<7,100	<10,900	<16,200
Light Collector	w/ Raised Median (2.2A)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	w/ Continuous Left-Turn Lane (2.2B)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	w/ Intermittent Turn Lanes (2.2C)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	W/ Passing Lane (2.2D)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	No Median (2.2E)	2	<1,900	<4,100	<7,100	<10,900	<16,200
	w/ Reduced Shoulder (2.2F)	2	<5,800	<6,800	<7,800	<8,700	<9,700
Minor Collector	w/ Raised Median (2.3A)	2	<3,000	<6,000	<7,000	<8,000	<9,000
	w/ Intermittent (Turn Lane (2.3B)	2	<3,000	<6,000	<7,000	<8,000	<9,000
	No Median (2.3C)	2	<1,900	<4,100	<6,000	<7,000	<8,000
NON-MOBILITY ELEMENT ROADS **			LEVELS OF SERVICE				
Residential Collector		2	-	-	<4,500	-	-
Rural Residential Collector ***		2	-	-	<4,500	-	-
Residential Road		2	-	-	<1,500	-	-
Rural Residential Road ***		2	-	-	<1,500	-	-
Residential Cul-de-Sac or Loop Road		2	-	-	<200	-	-

The values shown may be subject to adjustment based on the geometry of the roadway side frictions, and other relevant factors as determined by the Director, Department of Public Works.
**Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.
***Rural Residential Collectors and Rural Residential Roads are intended to serve areas with lot sizes of 2 acres or more which do not have a demand for on-street parking. On-street parking is not assured for these cross sections. Additional right-of-way is needed if on-street parking is in paved area.
****See Tables 2A and 28 for roadway surfacing and right-of-way widths.

4.3.4 *Freeway Mainline Operations*

Freeway segments were analyzed for all analysis scenarios. Freeway segment LOS is based on the volume to capacity ratio on the freeway. The analysis of freeway segment LOS is based on the procedure developed by CALTRANS District 11 based on methods described in the *Highway Capacity Manual*. The procedure involves comparing the peak hour volume of the mainline segment to the theoretical capacity of the roadway (V/C).

Table 4–4 summarizes the Freeway Segment level of service definitions.

TABLE 4–4
CALTRANS DISTRICT 11 - FREEWAY SEGMENT LEVEL OF SERVICE DEFINITIONS

LOS	V/C	Congestion / Delay	Traffic Description
USED FOR FREEWAYS, EXPRESSWAYS AND CONVENTIONAL HIGHWAYS			
A	<0.41	None	Free flow
B	0.42-0.62	None	Free to stable flow, light to moderate volumes.
C	0.63-0.80	None to minimal	Stable flow, moderate volumes, freedom to maneuver noticeably restricted
D	0.81-0.92	Minimal to substantial	Approaches unstable flow, heavy volumes, very limited freedom to maneuver.
E	0.93-1.00	Significant	Extremely unstable flow, maneuverability and psychological comfort extremely poor.
USED FOR FREEWAYS AND EXPRESSWAYS			
F(0)	1.01-1.25	Considerable 0-1 hour delay	Forced flow, heavy congestion, long queues form behind breakdown points, stop and go.
F(l)	1.26-1.35	Severe 1-2 hour delay	Very heavy congestion, very long queues.
F(2)	1.36-1.45	Very Severe 2-3 hour delay	Extremely heavy congestion, longer queues, more numerous breakdown points, longer stop periods.
F(3)	>1.46	Extremely Severe: 3+ hours of delay	Gridlock

The procedure for calculating freeway LOS involves the estimation of volume to capacity (V/C) ratio using the following equation:

$$V/C = \frac{\text{(Daily Volume * Peak Hour Percent * Directional Factor * Truck Factor)}}{\text{Capacity}}$$

Notes:

a. Daily Volume = Annual Average Daily Traffic (AADT)
b. Peak Hour Percent = Percentage of ADT occurring during the peak hour.
c. Directional Factor = Percentage of peak hour traffic occurring in peak direction.
d. Truck Factor = Truck/terrain factor to represent influence of heavy vehicles & grades.
e. Capacity = 2,000 vehicles/lane/hour/lane for mainline, and 1,200 for auxiliary lanes.

The resulting V/C is then compared to accepted ranges of V/C values corresponding to the various Levels of Service for each facility classification, as shown in *Table 4–4*. The corresponding Level of Service represents an approximation of existing or anticipated future freeway operating conditions in the peak direction of travel during the peak hour.

The Year 2015 Freeway Volumes obtained from the Caltrans Performance Measurement System (PeMS) and the most current available Truck Factors are included in *Appendix A*.

4.3.5 *Metered Freeway Ramps*

A ramp meter analysis was conducted at the metered ramps in the study area to which the Project would add the specified amount of traffic. The following two metered on-ramps to SR 78 are analyzed since the Project would add more than 20 peak hour trips to the on-ramps.

- Eastbound Via De La Valle to Southbound I-5
- Eastbound Via De La Valle to Northbound I-5

BACKGROUND

The measure of effectiveness (MOE) for the metered freeway ramp analysis is delay in minutes. Ramp meter flow rates characteristically vary throughout the peak hour based on the performance of the freeway mainline. As the mainline becomes more congested, the ramp meter rates decline, allowing fewer vehicles onto the freeway in the same time period.

ANALYSIS METHODOLOGY

The ramp meters were analyzed using the Fixed Rate Method. With the Fixed Rate Method, using the most restrictive flow rate during the peak hour, the total discharge and delay (in minutes) are calculated and the corresponding queue lengths are calculated.

The metering information was obtained from Caltrans for the ramps listed above and is included in *Appendix A*.

4.3.6 *Arterial Analysis*

A peak hour arterial analysis was conducted on Via De La Valle in addition to the ADT segment analysis. The speed of vehicles on urban streets is influenced by three main factors: street environment, interaction among vehicles, and traffic control. As a result, these factors affect quality of service. There is a distinct set of urban street LOS for each urban street class. Levels of service based on prevailing speeds and class of arterials determine the operations of arterials. The Arterial Class is calculated automatically by the Synchro software used for this analysis based on the distances between intersections and the link speeds.

Table 4–5 is based on FHWA research that shows longer running times on networks with short segments. This will cause longer travel times and lower LOS than using the free flow speeds.

Travel Time = Running Time + Signal Delay (intersection delay)

Arterial Speed = Total Distance / Total Travel Time

Segment Distance = Total Distance / Number of Segments

Flow Speed = Free Flow Speed (FFS) / Link.

TABLE 4–5
ARTERIAL ANALYSIS DEFINITIONS

Speed (mph)	Segment Distance	Class
1 to 29	any	IV
30 to 35	< 2000 ft	IV
30 to 35	>/= 2000 ft	III
36 to 45	any	II
above 45	any	I

5.0 SIGNIFICANCE CRITERIA

A project is considered to have a significant impact if the new project traffic has decreased the operations of surrounding roadways by a defined threshold. The defined thresholds shown in ***Table 5–1*** below for freeway segments, roadway segments, intersections, and ramp meter facilities are based on published San Diego Traffic Engineers' Council (SANTEC) guidelines with LOS D being the minimum acceptable LOS. If the project exceeds the thresholds in *Table 5–1*, then the project may be considered to have a significant project impact. A feasible mitigation measure will need to be identified to return the impact within the thresholds (pre-project + allowable increase) or the impact will be considered significant and unmitigated.

TABLE 5–1
TRAFFIC IMPACT SIGNIFICANT THRESHOLDS

Level of Service with Project [a]	Allowable Increase Due to Project Impacts [b]					
	Freeways		Roadway Segments		Intersections	Ramp Metering
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (seconds)	Delay (minutes)
E & F (*or ramp meter delays above 15 minutes*)	0.01	1	0.02	1	2	2[c]

Footnotes:

a. All level of service measurements are based upon HCM procedures for peak-hour conditions. However, V/C ratios for Roadway Segments may be estimated on an ADT/24-hour traffic volume basis (using Table 2 or a similar LOS chart for each jurisdiction). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.

b. If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are deemed to be significant. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigations (within the Traffic Impact Study [TIS] report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note a above), or if the project adds a significant amount of peak hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating significant impact changes.

c. The impact is only considered significant if the total delay exceeds 15 minutes.

General Notes:

1. V/C = Volume to Capacity Ratio
2. Speed = Arterial speed measured in miles per hour
3. Delay = Average stopped delay per vehicle measured in seconds for intersections, or minutes for ramp meters.
4. LOS = Level of Service

6.0 ANALYSIS OF EXISTING CONDITIONS

6.1 Typical Weekday / Weekend

6.1.1 *Peak Hour Intersection Levels of Service (Typical Weekday / Weekend)*

Table 6–1 summarizes the Existing (Typical Weekday / Weekend) peak hour intersection operations. As seen in *Table 6–1*, on a Typical Weekday, all study area intersections are calculated to currently operate at LOS D or better except the following intersections:

- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS E during the PM peak hour)

On a Typical Weekend, all study area intersections are calculated to currently operate at LOS D or better except the following intersections:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the Weekend PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the Weekend PM peak hour)

Appendix B-1 contains the Existing (Typical Weekday) peak hour intersection analysis worksheets and ***Appendix B-2*** contains the Existing (Typical Weekend) peak hour intersection analysis worksheets.

6.1.2 *Daily Street Segment Levels of Service (Typical Weekday)*

Table 6–2 summarizes the Existing (Typical Weekday) segment operations. As seen in *Table 6–2*, all study area segments are calculated to currently operate at LOS D or better except the following:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS E)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS E)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS E)

Segment analysis was not conducted during a Typical Weekend.

VIA DE LA VALLE PEAK HOUR OPERATIONS

Table 6–3 summarizes the most recent available 85th percentile speeds recorded at two locations on Via De La Valle between Highway 101 and Jimmy Durante Boulevard on a typical weekday, ON June 1, 2017. The prevailing 85th percentile speeds were observed to vary between 39 and 43 mph in either direction during the AM and PM peak hours. The observed speeds shown in *Table 6-3* are the lower of the two observed speeds.

An existing peak hour arterial analysis was conducted to compare the existing 85th percentile speed on Via De La Valle during the peak hour and the calculated speed on Via De La Valle between I-5 and Highway 101. *Table 6-3* also summarizes the results of the observed and calculated arterial speed along this corridor. As seen in *Table 6-3*, the observed and calculated speed are LOS C, except in the eastbound direction during the PM peak hour, which is calculated to operate at LOS D.

Based on the look-up table, daily LOS E capacity of (19,000 ADT), the existing level of service on Via de la Valle between Cedros Avenue and Jimmy Durante Boulevard is LOS E (almost LOS F). However, the peak hour arterial analysis of Via de la Valle between Highway 101 and I-5 indicates LOS C operations (*Table 6-3*). This indicates that the actual functional capacity of Via de La Valle is higher than 19,000.

Appendix B-3 contains the Existing peak hour arterial analysis worksheets.

6.1.3 *Freeway Mainline Segments*

Table 6–4 summarizes the Existing (Typical Weekday) Freeway Mainline segment operations. Currently, the following freeway mainline segments are calculated to operate at LOS E or worse:

- **I-5: Lomas Santa Fe Drive and Via De La Valle** – LOS F(0) in the NB direction during the PM peak hour
- **I-5: Via De La Valle and Del Mar Heights Road** – LOS E in the SB direction during the AM peak hour and in the LOS F(0) NB direction during the PM peak hour

Freeway mainline Segment analysis was not conducted during a Typical Weekend.

6.1.4 *Metered Freeway On-Ramps*

Table 6–5 summarizes the Existing (Typical Weekday) Metered On-Ramp operations using the fixed rate analysis methodology. As shown in *Table 6–5*, no delay is calculated during the AM and PM peak hours using this methodology. This is due to the fact that the ramp meter discharge rate exceeds the peak hour demand. It is widely accepted among the industry that this methodology lacks accuracy in depicting "real world" conditions and often grossly overstates the calculated queues and delays.

In order to confirm the actual queue, observations were made in the field at the Eastbound Via De La Valle to southbound I-5 on-ramp. The field observations indicate that there is a nominal queue of up to a maximum of 7 vehicles in the SOV lane during the PM peak hour but the queues are generally between 2 and 4 vehicles, most of the time. The analysis assumes even distribution of the vehicles throughout the peak hour. However, in general, vehicles would be expected to arrive in platoons due to the upstream traffic signal. At the entrance to this ramp, traffic utilizes the exclusive right-turn lane on eastbound Via de la Valle and traffic enters the ramp fairly evenly. Based on observations, at the ramp, there are nominal queues at times and often, no queues.

TABLE 6–1
EXISTING INTERSECTION OPERATIONS – TYPICAL WEEKDAY / WEEKEND

Intersection	Control Type	Peak Hour	Delay [a]	LOS [b]
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay AM	32.8	C
		WkDay PM	41.8	D
		WkEnd PM	60.3	E
2. Cedros Ave / Lomas Santa Fe Dr	Signal	WkDay AM	33.4	C
		WkDay PM	21.7	C
		WkEnd PM	20.7	C
3. I-5 SB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	14.8	B
		WkDay PM	29.4	C
		WkEnd PM	12.4	B
4. I-5 NB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	16.1	B
		WkDay PM	14.3	B
		WkEnd PM	13.1	B
5. S. Sierra Ave / Dahlia Dr	AWSC [c]	WkDay AM	8.0	A
		WkDay PM	8.6	A
		WkEnd PM	8.0	A
6. Hwy 101/ Dahlia Dr	Signal	WkDay AM	7.7	A
		WkDay PM	5.9	A
		WkEnd PM	6.2	A
7. Border Ave / S. Sierra Ave	[d]	WkDay AM	DNE	NA
		WkDay PM	DNE	NA
		WkEnd PM	DNE	NA
8. Hwy 101 (Border Ave)/ Via De La Valle	Signal	WkDay AM	13.4	B
		WkDay PM	29.1	C
		WkEnd PM	23.3	C

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TABLE 6–1 (CONTINUED)
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Delay [a]	LOS [b]
9. Via De La Valle/ S. Cedros Ave	MSSC [e]	WkDay AM	21.8	C
		WkDay PM	33.0	D
		WkEnd PM	22.9	C
10. Via De La Valle/ Jimmy Durante Blvd	Signal	WkDay AM	36.7	D
		WkDay PM	40.1	D
		WkEnd PM	29.6	C
11. Via De La Valle / I-5 SB Ramps	Signal	WkDay AM	10.4	B
		WkDay PM	11.1	B
		WkEnd PM	9.8	A
12. Via De La Valle / I-5 NB Ramps	Signal	WkDay AM	24.2	C
		WkDay PM	27.0	C
		WkEnd PM	24.8	C
13. Camino Del Mar/ 27th St	AWSC	WkDay AM	16.2	C
		WkDay PM	28.9	D
		WkEnd PM	34.5	D
14. Camino Del Mar/ Coast Blvd	AWSC	WkDay AM	15.0	B
		WkDay PM	62.0	F
		WkEnd PM	30.2	D
15. Camino Del Mar/ L'Auberge Del Mar	Signal	WkDay AM	6.4	A
		WkDay PM	10.6	B
		WkEnd PM	8.9	A
16. Camino Del Mar/ 15th St	Signal	WkDay AM	21.8	C
		WkDay PM	31.8	C
		WkEnd PM	33.3	C

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TABLE 6–1 (CONTINUED)
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Delay [a]	LOS [b]
17. Camino Del Mar/ Del Mar Heights Rd	Signal	WkDay AM	32.8	C
		WkDay PM	77.5	E
		WkEnd PM	129.0	F
18. Camino Del Mar/ Carmel Valley Rd	Signal	WkDay AM	22.6	C
		WkDay PM	22.6	C
		WkEnd PM	12.2	B
19. Via de la Valle / Solana Circ	MSSC	WkDay AM	19.0	C
		WkDay PM	18.9	C
		WkEnd PM	15.4	C

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. AWSC – All-Way Stop Controlled intersection. Overall intersection delay reported.
d. This is a turn in the road without traffic control
e. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay reported.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

General Notes:

WkDay AM – Weekday AM
WkDay PM – Weekday PM
WkEnd PM – Weekend PM

TABLE 6–2
EXISTING STREET SEGMENT OPERATIONS – TYPICAL WEEKDAY

Street Segment	Jurisdiction	Functional Classification	Capacity (LOS E) [a]	ADT [b]	LOS [c]	V/C [d]
S. Sierra Avenue						
Del Mar Shore Ter to Beach Club Dr	Solana Beach	Minor Collector	8,000	3,400	B	0.425
Highway 101						
Lomas Santa Fe Dr to Dahlia Dr	Solana Beach	4-lane Major Art	37,000	15,000	B	0.405
Dahlia Dr to Via De La Valle	Solana Beach	4-lane Major Art	37,000	17,900	B	0.484
Camino Del Mar						
Via De La Valle to 27th St	Del Mar	Comm Collector	19,000	15,300	E	0.805
27th St to Coast Blvd	Del Mar	Comm Collector	19,000	10,900	B	0.574
Coast Blvd to Jimmy Durante Blvd	Del Mar	Comm Collector	19,000	8,900	A	0.468
Via De La Valle						
Hwy 101 to S. Cedros Ave	Del Mar	Town Collector	19,000	16,500	E	0.868
S. Cedros Ave to Jimmy Durante Blvd	Del Mar	Town Collector	19,000	18,800	E	0.989
Jimmy Durante Blvd to I-5 SB Ramps	San Diego	4-Ln Major Arterial [e]	50,000	44,200	E	0.884

Footnotes:

a. Capacities based on the San Diego County capacity at which the roadway operates.
b. Average Daily Traffic Volumes.
c. Level of Service.
d. Volume to Capacity.
e. A third eastbound through lane is provided along this segment, which merges into the I-5 SB on-ramp. Hence the capacity of an additional lane is assumed.

TABLE 6–3
EXISTING VIA DE LA VALLE ARTERIAL PEAK HOUR OPERATIONS – TYPICAL WEEKDAY BETWEEN HIGHWAY 101 AND I-5

Direction	Actual Observed				Calculated			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Travel Speed (mph)	LOS	Travel Speed (mph)	LOS	Travel Speed (mph)	LOS	Travel Speed (mph)	LOS
Westbound	39.0	C	39.0	C	25.6	C	25.1	C
Eastbound	39.0	C	39.0	C	25.5	C	22.7	D

TABLE 6–4
EXISTING FREEWAY MAINLINE SEGMENT OPERATIONS – TYPICAL WEEKDAY

Freeway Segment	Dir.	# of Lanes	Hourly Cap [a]	AADT [b]	K Factor		D Factor		Truck Factor [c]	Peak Hour Volume [d]		V/C [e]		LOS	
					AM	PM	AM	PM		AM	PM	AM	PM	AM	PM
Interstate 5															
Lomas Santa Fe Dr to Via De La Valle	NB	4ML + 1HOV + 1Aux	9,200	204,200	0.0752	0.0798	0.4446	0.5476	0.9309	7,334	9,586	0.797	1.042	C	F(0)
	SB	5ML + 1Aux	10,000		0.0752	0.0798	0.5554	0.4524		9,162	7,919	0.916	0.792	D	C
Via De La Valle to Del Mar Heights Rd	NB	4ML + 1HOV + 1Aux	9,200	209,600	0.0752	0.0798	0.4446	0.5476	0.9309	7,528	9,839	0.818	1.069	D	F(0)
	SB	5ML + 1HOV	10,000		0.0752	0.0798	0.5554	0.4524		9,404	8,129	0.940	0.813	E	D
Del Mar Heights Rd to SR 56	NB	6ML + 1Aux+1HOV	12,800	176,100	0.0752	0.0798	0.4446	0.5476	0.9309	6,325	8,267	0.494	0.646	B	C
	SB	5ML + 1Aux+1HOV	11,000		0.0752	0.0798	0.5554	0.4524		7,901	6,829	0.718	0.621	C	C

Footnotes:

a. Capacity calculated at 1800 vph per lane and 1200 vph per Auxiliary lane
b. Existing Average Annual Daily Traffic Volumes from Caltrans PeMS (3-month period beginning March 2016).
c. Truck Factor from "2016 Annual Average Daily Truck Traffic on the California State Highway System".
d. Peak Hour Volumes factored using Passenger Car Equivalent for trucks.
e. V/C = (Peak Hour volume/Truck Factor/Capacity)

LOS	v/c
A	<0.41
B	0.62
C	0.80
D	0.92
E	1.00
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 6–5
EXISTING METERED RAMPS OPERATIONS – TYPICAL WEEKDAY

Location/Condition		Peak Hour Flow (F) (veh/hr/ln) [a]	Calculated (Most Restrictive)			
			Discharge Rate [b] (veh/hr/ln)	Excess Demand E (veh/hr/ln)	Delay (min/ln)	Queue (ft)
EB Via De La Valle to SB I-5						1 SOV + 1 HOV
AM						
	SOV	665	996	0	0	0
	HOV [b]	117	996	0	0	0
PM						
	SOV	529	996	0	0	0
	HOV [b]	93	996	0	0	0
EB Via De La Valle to NB I-5						2 SOV
PM						
	SOV	209	372	0	0	0

Footnotes:

a. Existing volumes - Average of volumes from March through April, 2017, from PeMS.
b. Discharge rates obtained from Caltrans (*Appendix A*).
c. A 15% Reduction in volume is applied to the volume in SOV lanes due to HOV lane

General Notes:

SOV – Single Occupancy Vehicle Lane
HOV – High Occupancy Vehicle Lane

6.2 During Fair

6.2.1 *Peak Hour Intersection Levels of Service (During Fair)*

The study area for the "During the Fair" scenario includes the intersections closest to the fair. ***Table 6–6*** summarizes the Existing During Fair peak hour intersection operations at intersections where the counts were conducted. Since the Fair activities occur outside of the AM peak hour, only PM peak hour analysis was conducted during the Fair. *Table 6–6* shows that the following study area intersections are calculated to currently operate at LOS E or worse during the Fair on weekdays:

- **Via De La Valle / Jimmy Durante Boulevard** (LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS F during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)

It may be noted that the Jimmy Durante / Via De La Valle intersection operates with manual control during the Fair. The analysis of this intersection was conducting assuming the existing "Typical" signal timing which provides a conservative analysis.

During the Fair on a weekend, in the PM peak hour, the following study area intersection is calculated to currently operate at LOS E:

- **Camino Del Mar / Coast Boulevard** (LOS E during the PM peak hour)

The Existing During Fair Weekday and Weekend peak hour intersection analysis worksheets are included in ***Appendix C***.

6.2.2 *Daily Street Segment Levels of Service (During Fair)*

Table 6–7 summarizes the Existing During Fair segment operations. As seen in *Table 6–7*, all study area segments are calculated to currently operate at LOS D or better During the Fair except the following:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Camino Del Mar:** 27th Street to Coast Boulevard (LOS E)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS E)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS F)

It may be noted that an arterial analysis of the Via de la Valle corridor would not be appropriate during the fair since the traffic signal at the Via de la Valle / Jimmy Durante intersection is controlled by personnel manually and not by the traffic signal controller.

TABLE 6–6
EXISTING INTERSECTION OPERATIONS – DURING FAIR

Intersection	Control Type	Peak Hour	Delay [a]	LOS [b]
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay AM	31.7	C
		WkDay PM	48.6	D
		WkEnd PM	40.5	D
6. Hwy 101/ Dahlia Dr	Signal	WkDay AM	6.9	A
		WkDay PM	8.2	A
		WkEnd PM	6.5	A
8. Hwy 101 (Border Ave)/ Via De La Valle	Signal	WkDay AM	14.9	B
		WkDay PM	24.0	C
		WkEnd PM	21.4	C
9. Via De La Valle/ S. Cedros Ave	MSSC [C]	WkDay AM	22.7	C
		WkDay PM	23.0	C
		WkEnd PM	17.7	C
10. Via De La Valle/ Jimmy Durante Blvd	Signal	WkDay AM	37.3	D
		WkDay PM	64.9	E
		WkEnd PM	52.1	D
11. Via De La Valle / I-5 SB Ramps	Signal	WkDay AM	10.3	B
		WkDay PM	12.4	B
		WkEnd PM	17.7	B
12. Via De La Valle / I-5 NB Ramps	Signal	WkDay AM	24.0	C
		WkDay PM	29.9	C
		WkEnd PM	29.4	C
13. Camino Del Mar/ 27th St	AWSC [d]	WkDay AM	17.3	C
		WkDay PM	68.4	F
		WkEnd PM	45.7	E

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TABLE 6–6 (CONTINUED)
EXISTING INTERSECTION OPERATIONS – DURING FAIR WEEKDAY

Intersection	Control Type	Peak Hour	Delay [a]	LOS [b]
14. Camino Del Mar/ Coast Blvd	AWSC	WkDay AM	17.6	C
		WkDay PM	93.4	F
		WkEnd PM	39.0	E
16. Camino Del Mar/ 15th St	Signal	WkDay AM	21.7	C
		WkDay PM	31.0	C
		WkEnd PM	30.9	C
19. Via de la Valle / Solana Circ	MSSC	WkDay AM	17.2	C
		WkDay PM	14.5	B
		WkEnd PM	DNA	DNA

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay reported.
d. AWSC – All-Way Stop Controlled intersection. Overall intersection delay reported.

General Notes:
WkDay AM – Weekday AM
WkDay PM – Weekday PM
WkEnd PM – Weekend PM
DNA – Did not analyze

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 6–7
EXISTING STREET SEGMENT OPERATIONS – DURING FAIR

Street Segment	Jurisdiction	Functional Classification	Capacity (LOS E) [a]	ADT [b]	LOS [c]	V/C [d]
S. Sierra Avenue						
Del Mar Shore Ter to Beach Club Dr	Solana Beach	Minor Collector	8,000	3,500	B	0.438
Highway 101						
Lomas Santa Fe Dr to Dahlia Dr	Solana Beach	4-lane Major Art	37,000	18,700	B	0.505
Dahlia Dr to Via De La Valle	Solana Beach	4-lane Major Art	37,000	19,000	B	0.514
Camino Del Mar						
Via De La Valle to 27th St	Del Mar	Comm Collector	19,000	17,700	E	0.932
27th St to Coast Blvd	Del Mar	Comm Collector	19,000	16,800	E	0.884
Coast Blvd to Jimmy Durante Blvd	Del Mar	Comm Collector	19,000	11,300	B	0.595
Via De La Valle						
Hwy 101 to S. Cedros Ave	Del Mar	Town Collector	19,000	15,600	E	0.821
S. Cedros Ave to Jimmy Durante Blvd	Del Mar	Town Collector	19,000	24,300	F	1.279
Jimmy Durante Blvd to I-5 SB Ramps	San Diego	4-Lane Maj Art [e]	50,000	58,200	F	1.164

Footnotes:

a. Capacities based on the San Diego County capacity at which the roadway operates.

b. Average Daily Traffic Volumes.

c. Level of Service.

d. Volume to Capacity.

e. A third eastbound through lane is provided along this segment, which merges into the I-5 SB on-ramp. Hence the capacity of an additional lane is assumed.

6.3 During Horse Races

6.3.1 *Peak Hour Intersection Levels of Service (During Horse Races)*

Table 6–8 summarizes the Existing Weekday and Weekend During Horse Races PM peak hour intersection operations. Since the horse races do not begin until after noon, only PM peak hour analysis was conducted during the Horse Races. *Table 6–8* shows that During Horse Races on a Weekday, the following study area intersections are calculated to currently operate at LOS E or worse:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Via De La Valle / S. Cedros Avenue** (SB left-turn LOS F during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the PM peak hour)

On a Weekend, the following study area intersections are calculated to currently operate at LOS E or worse:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the PM peak hour)

The Existing During Horse Races Weekday and Weekend peak hour intersection analysis worksheets are included in ***Appendix D-1 and D-2*** respectively.

6.3.2 *Daily Street Segment Levels of Service During Horse Races*

Table 6–9 summarizes the Existing During Horse Races segment operations. As seen in *Table 6–9*, all study area segments are calculated to currently operate at LOS D or better During Horse Races except the following:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Camino Del Mar:** 27th Street to Coast Boulevard (LOS E)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS E)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS E)

TABLE 6–8
EXISTING INTERSECTION OPERATIONS – DURING HORSE RACES TYPICAL WEEKDAY / WEEKEND

Intersection	Control Type	Peak Hour	Delay [a]	LOS [b]
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay PM	61.0	E
		WkEnd PM	68.1	E
2. Cedros Ave / Lomas Santa Fe Dr	Signal	WkDay PM	20.7	C
		WkEnd PM	21.7	C
3. I-5 SB Ramps / Lomas Santa Fe Dr	Signal	WkDay PM	20.6	C
		WkEnd PM	14.7	B
4. I-5 NB Ramps / Lomas Santa Fe Dr	Signal	WkDay PM	14.3	B
		WkEnd PM	12.5	B
5. S. Sierra Ave / Dahlia Dr	MSSC [c]	WkDay PM	8.1	A
		WkEnd PM	13.6	B
6. Hwy 101/ Dahlia Dr	Signal	WkDay PM	5.8	A
		WkEnd PM	6.5	A
7. Border Ave / S. Sierra Ave	[d]	WkDay PM	DNE	[d]
		WkEnd PM	DNE	[d]
8. Hwy 101 (Border Ave) /Via De La Valle	Signal	WkDay PM	24.4	C
		WkEnd PM	23.6	C
9. Via De La Valle/ S. Cedros Ave	MSSC	WkDay PM	31.3	D
		WkEnd PM	18.1	C
10. Via De La Valle/ Jimmy Durante Blvd	Signal	WkDay PM	35.6	D
		WkEnd PM	30.6	C
11. Via De La Valle / I-5 SB Ramps	Signal	WkDay PM	9.1	A
		WkEnd PM	8.7	A
12. Via De La Valle / I-5 NB Ramps	Signal	WkDay PM	25.8	C
		WkEnd PM	24.8	C

CONTINUED ON THE NEXT PAGE

TABLE 6–8 (CONTINUED)
EXISTING INTERSECTION OPERATIONS – DURING HORSE RACES WEEKDAY / WEEKEND

Intersection	Control Type	Peak Hour	Delay [a]	LOS [b]
13. Camino Del Mar/ 27th St	AWSC [d]	WkDay PM	35.1	E
		WkEnd PM	29.4	D
14. Camino Del Mar/ Coast Blvd	AWSC	WkDay PM	257.9	F
		WkEnd PM	88.6	F
15. Camino Del Mar/ L'Auberge Del Mar	Signal	WkDay PM	9.2	A
		WkEnd PM	9.6	A
16. Camino Del Mar/ 15th St	Signal	WkDay PM	31.6	C
		WkEnd PM	33.4	C
17. Camino Del Mar/ Del Mar Heights Rd	Signal	WkDay PM	164.4	F
		WkEnd PM	113.9	F
18. Camino Del Mar/ Carmel Valley Rd	Signal	WkDay PM	28.2	C
		WkEnd PM	13.8	B
19. Via de la Valle / Solana Circ	MSSC	WkDay PM	22.4	C
		WkEnd PM	16.5	C

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay reported.
d. This is a turn in the road with no traffic control.
e. AWSC – All-Way Stop Controlled intersection. Overall intersection delay reported.

General Notes:

WkDay PM – Weekday PM
WkEnd PM – Weekend PM
DNE – Does not Exist

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 6–9
EXISTING STREET SEGMENT OPERATIONS – DURING HORSE RACES (WEEKDAY)

Street Segment	Jurisdiction	Functional Classification	Capacity (LOS E) [a]	ADT [b]	LOS [c]	V/C [d]
S. Sierra Avenue						
Del Mar Shore Ter to Beach Club Dr	Solana Beach	Minor Collector	8,000	4,300	C	0.538
Highway 101						
Lomas Santa Fe Dr to Dahlia Dr	Solana Beach	4-lane Major Art	37,000	19,400	B	0.524
Dahlia Dr to Via De La Valle	Solana Beach	4-lane Major Art	37,000	20,400	B	0.551
Camino Del Mar						
Via De La Valle to 27th St	Del Mar	Comm Collector	19,000	16,900	E	0.889
27th St to Coast Blvd	Del Mar	Comm Collector	19,000	18,500	E	0.974
Coast Blvd to Jimmy Durante Blvd	Del Mar	Comm Collector	19,000	12,800	C	0.674
Via De La Valle						
Hwy 101 to S. Cedros Ave	Del Mar	Town Collector	19,000	18,500	E	0.974
S. Cedros Ave to Jimmy Durante Blvd	Del Mar	Town Collector	19,000	23,700	F	1.247
Jimmy Durante Blvd to I-5 SB Ramps	San Diego	4-Lane Maj Art [e]	50,000	45,200	E	0.904

Footnotes:

a. Capacities based on the San Diego County capacity at which the roadway operates.

b. Average Daily Traffic Volumes.

c. Level of Service.

d. Volume to Capacity.

e. A third eastbound through lane is provided along this segment, which merges into the I-5 SB on-ramp. Hence the capacity of an additional lane is assumed.

7.0 CUMULATIVE PROJECTS

7.1 Description of Projects

Research was conducted to identify cumulative projects within the Cities of Del Mar, Solana Beach and San Diego. In addition, projects within the County of San Diego and at the Del Mar Fairgrounds are included.

A. Del Mar Cumulative Projects

1. The *Watermark Project* in the City of Del Mar is located at the Jimmy Durante Boulevard / San Dieguito Drive intersection and includes the development of 48 Multi-family units generating an estimated 384 daily trips.

2. The *Garden Del Mar Project* in the City of Del Mar is located at the 10th Street / Camino Del Mar intersection and includes the development of 18 Multi-family units and a 1,458 SF restaurant, generating an estimated 363 daily trips.

3. The *Bully's* of Del Mar is located at the 14th Street / Camino Del Mar intersection and includes the development of a 5,000 SF restaurant, generating an estimated 500 daily trips.

4. The *Shores Park / Winston School Project* in the City of Del Mar is located at the 9th Street / Strafford Court intersection and includes the development of a recreation center and 80 parking stalls. This project will provide additional facilities to an existing school and therefore is not expected to generate additional traffic.

5. The *Del Mar City Hall* is located at the 11th Street / Camino Del Mar intersection and includes the development of a parking lot with 150 parking stalls. This project will provide additional facilities to the existing City Hall and therefore is not expected to generate additional traffic.

B. Solana Beach Cumulative Projects

6. *Solana Highlands* is located at 661 to 781 South Nardo Avenue. The existing 194 multi-family units would be demolished and 260 multi- family units would be constructed in 24 two and three-story buildings. Also proposed is a new recreation facility and clubhouse.

7. *The Pearl*, located at 555 South Sierra Avenue is a proposed three-story building designed to provide 10 housing units, commercial office space, and 53 parking spaces. Residential units would range from one to four bedrooms.

8. *Ocean Ranch Estates* located on 512 - 538 S. Nardo Avenue is a proposed Subdivision and construction of eight additional single-family homes as well as purchasing one off-site affordable accessible dwelling unit (ADU). The CEQA document is currently in process.

9. *330 S. Cedros Mixed Use* is located at 330 S. Cedros Avenue. This project includes the construction of a new 26,127 SF, two-story, mixed-use project with four (4) dwelling units, four (4) retail suites, and one (1) restaurant. This project was approved in December 2016.

10. The *NCTD Train Station Project* is located at 101 – 441 N. Cedros Avenue. The proposed project includes a mix of approximately 48,000 SF of restaurant, retail and office; 32,000 SF boutique hotel with approximately 45 rooms; 28,000 – 30,000 SF multi-family residential (30 units); 1250 underground parking spaces; plaza and green space. The project is currently in the Planning. The conceptual plan has been presented to the City Council. There is no application on file.

11. *Feather Acres* is a 7- lot subdivision located at 980 Avocado Place. The seven-lot subdivision to be graded and the lots are to be developed individually. The Final Map is approved and grading is underway.

12. Genevieve Street is a 99-bed Senior Care Facility Specific Plan located at 959 Genevieve Street. This is an 85-unit residential care facility that could accommodate up to 99 beds. The CEQA document in process.

13. *Solana 101* is a mixed-use development consisting of 31 Apartments; 24,284 square feet of Specialty Supermarket; 14,137 square feet of Standard Commercial Office; 5,125 square feet of High Turnover Restaurant; and 5,090 square feet of Quality Restaurant.

14. *San Andres Drive Median Improvements* includes Construction of curb medians, pedestrian ramps, asphalt concrete overlays, traffic striping and markings, and traffic signage along San Andres Drive. This project is estimated to generate no new trips.

15. *Stevens Ave CATS Project* includes complete streets improvements. This project is estimated to generate no new trips.

16. *Lomas Santa Fe Corridor Study* is the study of the Lomas Santa Fe Drive corridor. This project is estimated to generate no new trips.

17. *Skyline Elementary School Reconstruction* includes reconstruction of the school campus. This project is estimated to generate no new trips.

18. *Earl Warren Middle School Reconstruction* includes reconstruction of the school campus. This project is estimated to generate no new trips.

19. *Solana Beach School District Office and Child Development Center Modular Building Replacement Project* includes construction of a replacement of an office building. This project is estimated to generate no new trips.

20. *Santa Fe Christian School Master Plan Update* includes K-12th grade campus wide improvement plan.

C. City of San Diego Cumulative Projects

21. The *Via De La Valle Town Home Project* is located in the City of San Diego and includes 22 residential units. This Project is estimated to generate 176 daily trips.

22. The *St. John Armenian Church Project* located in the City of San Diego includes an 8,800 SF church, 6,200 SF assembly area, 11,900 SF offices and ancillary space, an Education Center with 10 classrooms and a gymnasium. This Project is estimated to generate a total of 404 daily trips. This Project is under review by the City of San Diego.

23. The *Hacienda Del Mar Project* is a proposed Senior Care Facility consisting of 71 units of independent living, 45 units of assisted living, and 34 memory care rooms. The facility would provide a total of 195 beds.

D. San Diego County

24. The *Morgan Country Club Project* is located in the County of San Diego and consists of a 9,400 SF health club. This Project is estimated to generate 283 daily trips. This Project is under review by the County.

E. Other Agencies

25. The *22nd District Agricultural Association Master Plan* includes various developments generating a total of 6,960 daily trips. The Master Plan traffic study included is project also includes a hotel and a health club. For the purpose of this analysis these uses are included in the long-term analysis.

26. The *Surfside Race Place* is a 1,869 seat concert venue along with an approximately 7,000 square foot beer tasting area/exhibit ("History of Beer"). It is anticipated that the concert venue would operate year-round; however, during the annual San Diego County Fair, the venue would be a part of the concert venues associated with the Fair (similar to the Grandstand stage). Existing food service areas would continue to operate as well as the off-track betting component of the facility. No alterations to the exterior or expansion of the existing structure is proposed. All improvements would be internal.

7.2 Summary of Cumulative Projects Trips

As seen in ***Table 7-1***, the cumulative projects are calculated to generate a total of 20,303 daily trips. Weekend trip generation rates are not available from SANDAG. Hence, the weekend trip rates in the ITE Trip Generation Manual were reviewed. Weekend trip rates are not available for many land uses and for those where rates were available, the rates are generally lower during the weekend than the weekday. In order to provide a conservative analysis, the weekend PM peak hour cumulative trips were assumed to be the same as the weekday cumulative trips.

The following figures are included at the end of this section:

- ***Figure 7–1*** Cumulative Projects Location Map
- ***Figure 7–2*** Cumulative Projects Traffic Volumes
- ***Figure 7–3*** Typical Weekday Existing + Cumulative Projects Traffic Volumes
- ***Figure 7–4*** Typical Weekend Existing + Cumulative Projects Traffic Volumes
- ***Figure 7–5*** Weekday During Fair Existing + Cumulative Projects Traffic Volumes
- ***Figure 7–6*** Weekday During Horse Races Existing + Cumulative Projects Traffic Volumes
- ***Figure 7–7*** Weekend During Horse Races Existing + Cumulative Projects Traffic Volumes

TABLE 7–1
CUMULATIVE PROJECTS DAILY TRIPS

Project	Land Use Description	Units	Daily
A. City of Del Mar			
1. Watermark	Multi-Family Residential	48 DU	384
2. Garden Del Mar	Multi-Family Residential, Restaurant		363
3. Bully's	Restaurant	5,000 SF	500
4. Shores Park / Winston School	Active Recreation Center		0
5. Del Mar City Hall [b]	Parking	150 Stalls	
Subtotal Del Mar			**1,247**
B. Solana Beach			
6. Solana Highlands	Multi-Family Residential	66 DU	528
7. The Pearl	Single Family Residential	8 DU	80
8. Ocean Ranch Estates	Mixed Use, Office, Restaurant		888
9. 330. S. Cedros Mixed Use	Retail, restaurant, Office, Residential		494
10. NCTD Train Station Project	Restaurant, Retail / Office, Hotel, Multi-Fam		2,520
11. Feather Acres 7- lot subdivision	Single Family Residential	7 DU	70
12. Genevieve St. Senior Care Facility	Residential Care	99 Beds	248
13. Solana 101	Retail, Restaurant, Office, Residential		1,705
14. San Andres Drive Median Improvements [b]	Roadway Improvements		
15. Stevens Ave CATS Project [b]	Complete Streets Improvement		
16. Lomas Santa Fe Corridor Study [b]	Corridor Study		
17. Skyline Elementary School Reconstruction [b]	School Campus Reconstruction		
18. Earl Warren Middle School Reconstruction [b]	School Campus Reconstruction		
19. Solana Beach School District Office and Child Development Center Modular Building Replacement Project [b]	replacing office building		
20. Santa Fe Christian School Master Plan Update [b]	campus wide improvement plan	172.336 KSF	2,580
Subtotal Solana Beach			**8,933**
C. City of San Diego			
21. Via De La Valle Townhomes	Residential	22 DU	176
22. St. John Armenian Church	Church, Assembly, Offices, School, Gym	8,800 SF	*404*
23. Hacienda del Mar	Assisted Living	Various	590
Subtotal City of San Diego			**1,170**
D. San Diego County			
24. Morgan Country Club	Health Club	9,400 SF	283
Subtotal City of San Diego			**283**
E. Other Agencies			
25. 22nd District Agricultural Association Master Plan	Various	Various	6,960
26. Surfside Race Place	Special Events		1,530
Subtotal Other Agencies			**8,490**
Total Cumulative Projects			**20,303**

Footnotes:

a. Trip rates from *(Not So) Brief guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002, SANDAG.

b. Does not generate any new trips.

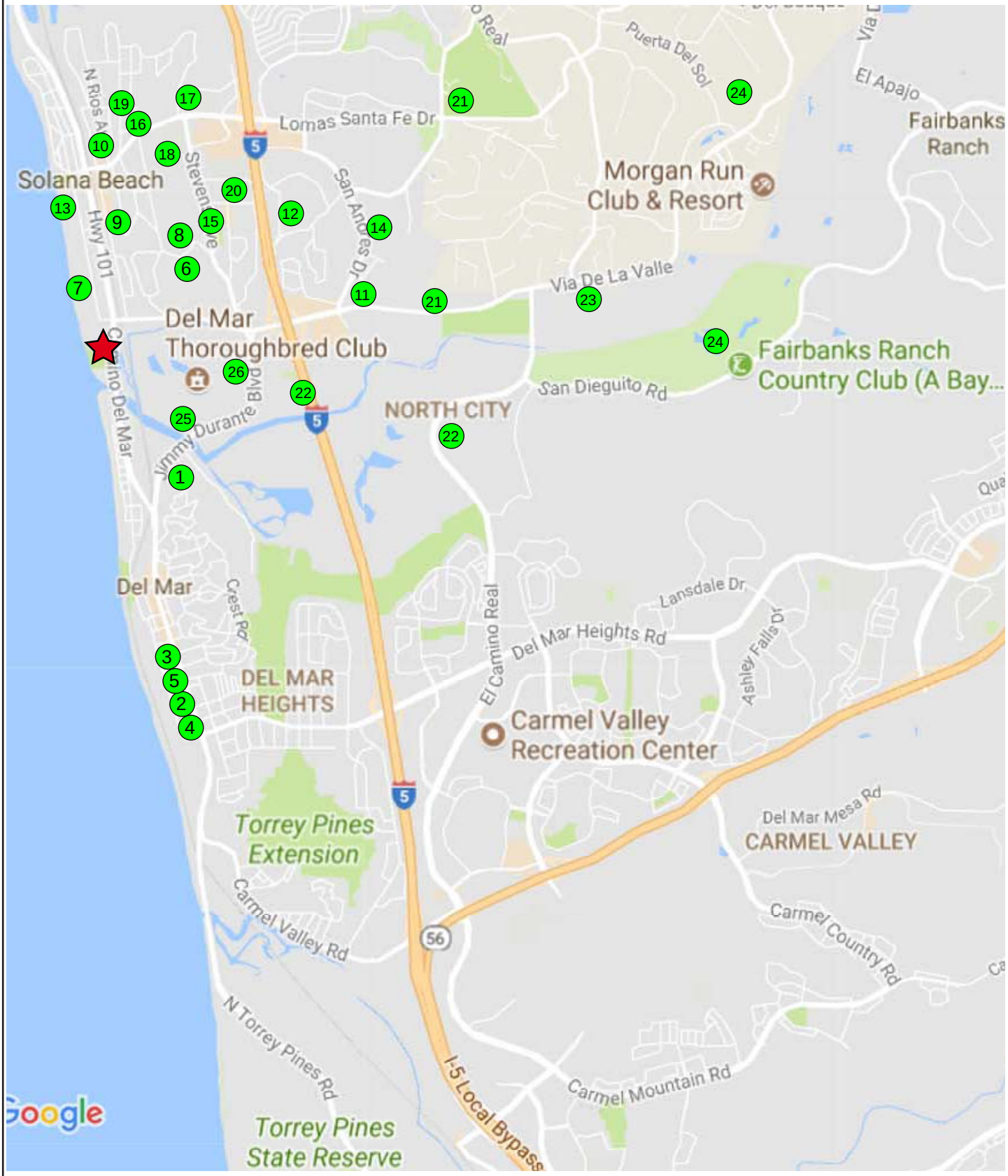

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Figure 7-1

Cumulative Projects Location Map

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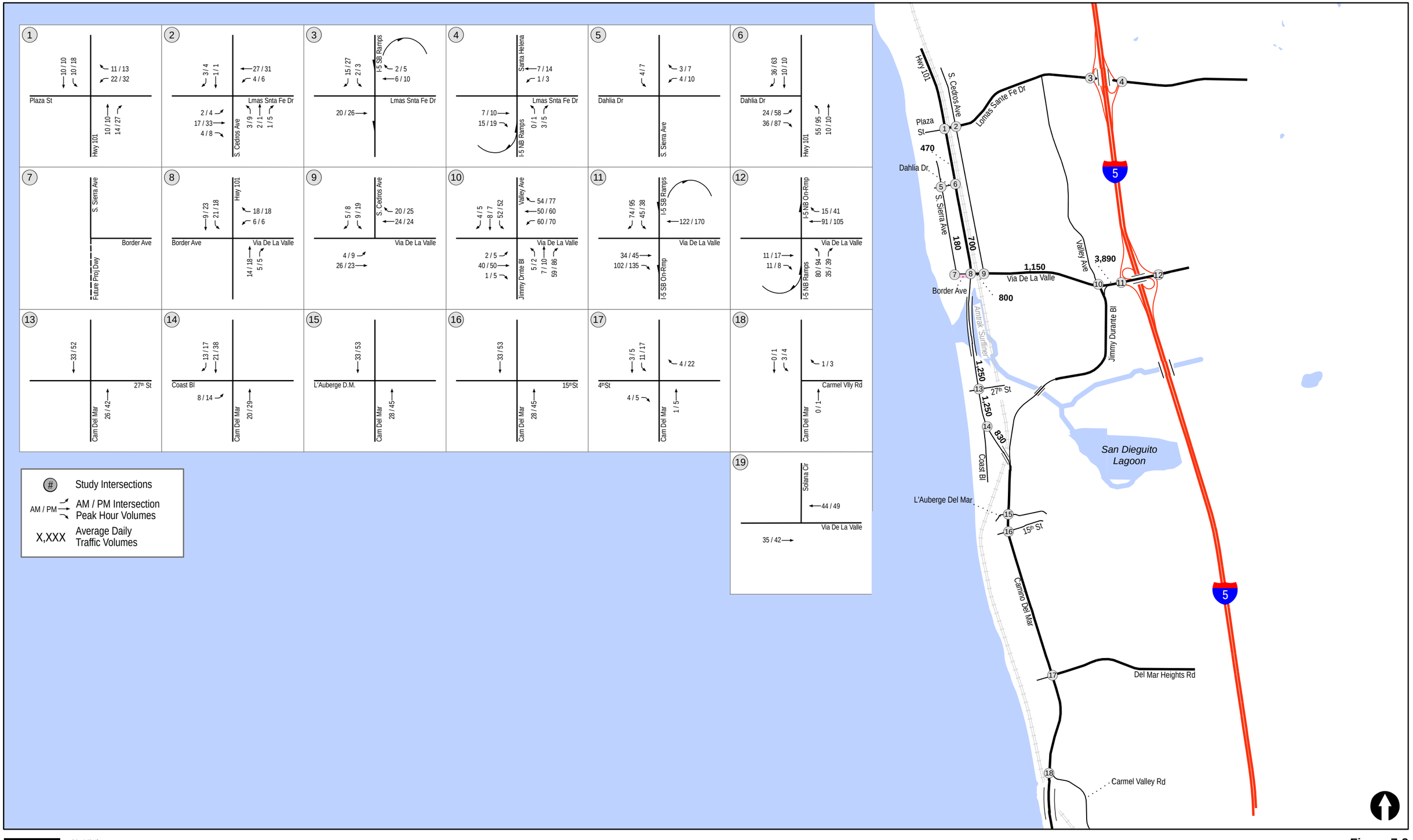

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Figure 7-2

Cumulative Projects Traffic Volumes

Typical Weekday

DEL MAR RESORT

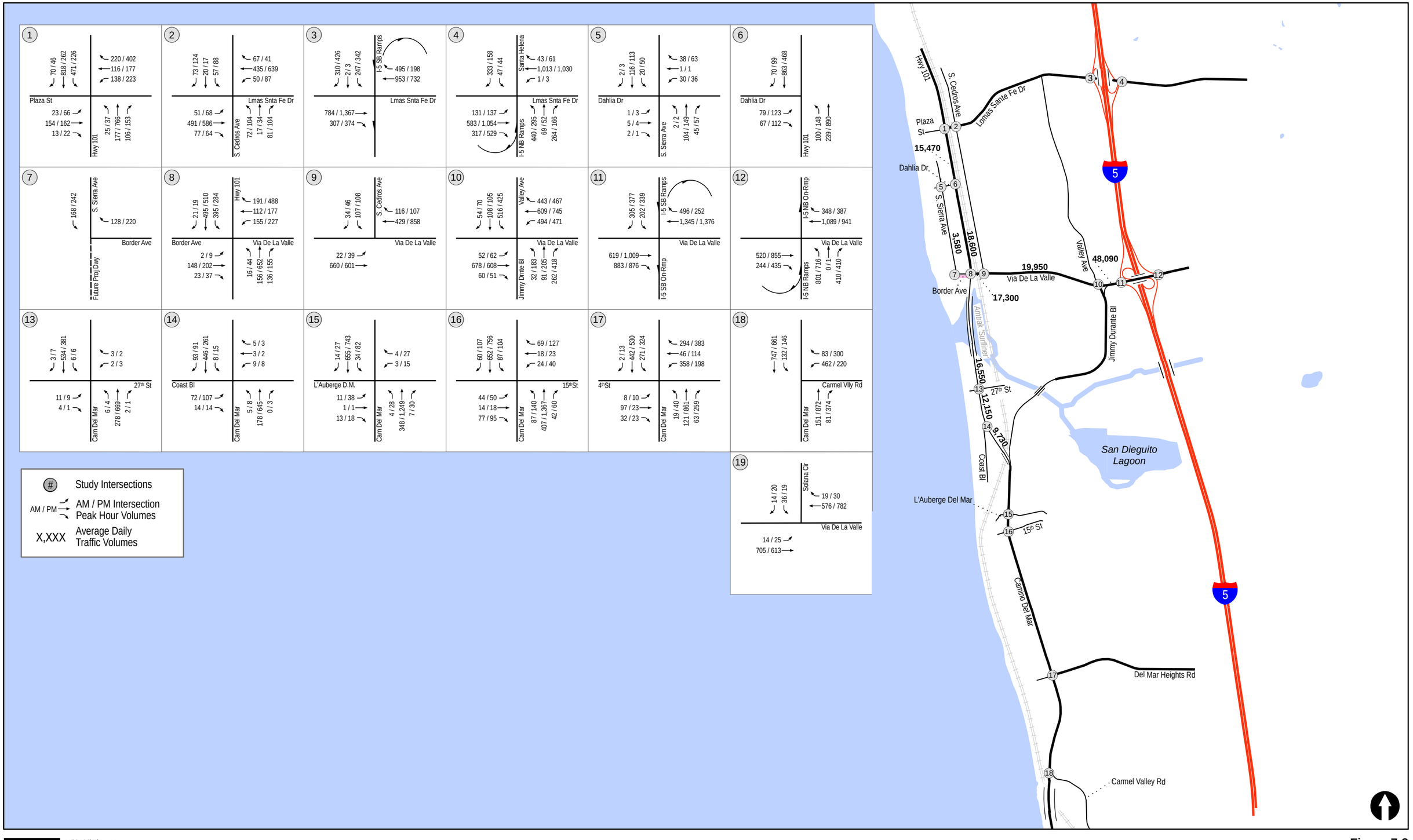

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Figure 7-3

Existing + Cumulative Projects Traffic Volumes

Typical Weekday

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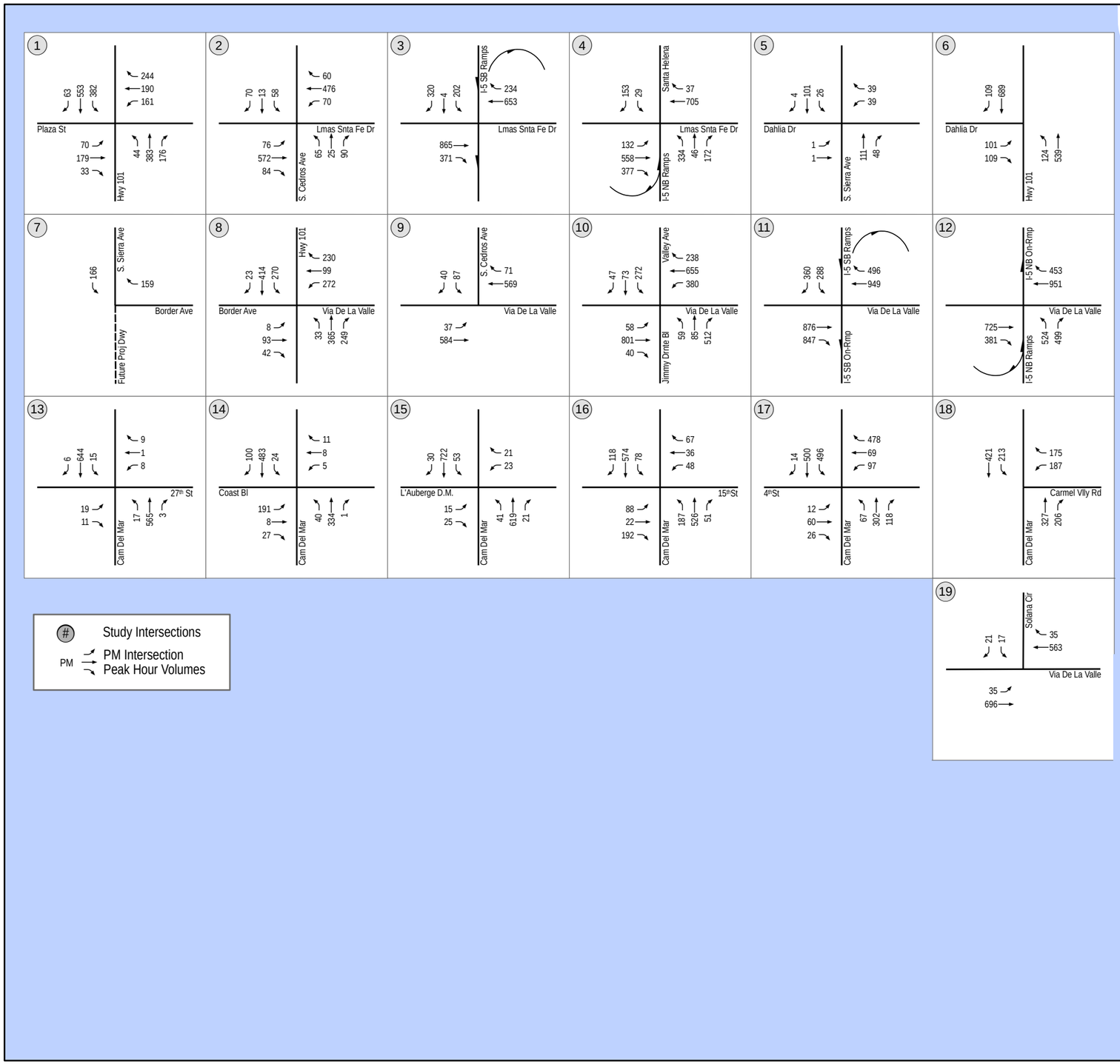

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Figure 7-4

Existing + Cumulative Projects Traffic Volumes

Typical Weekend

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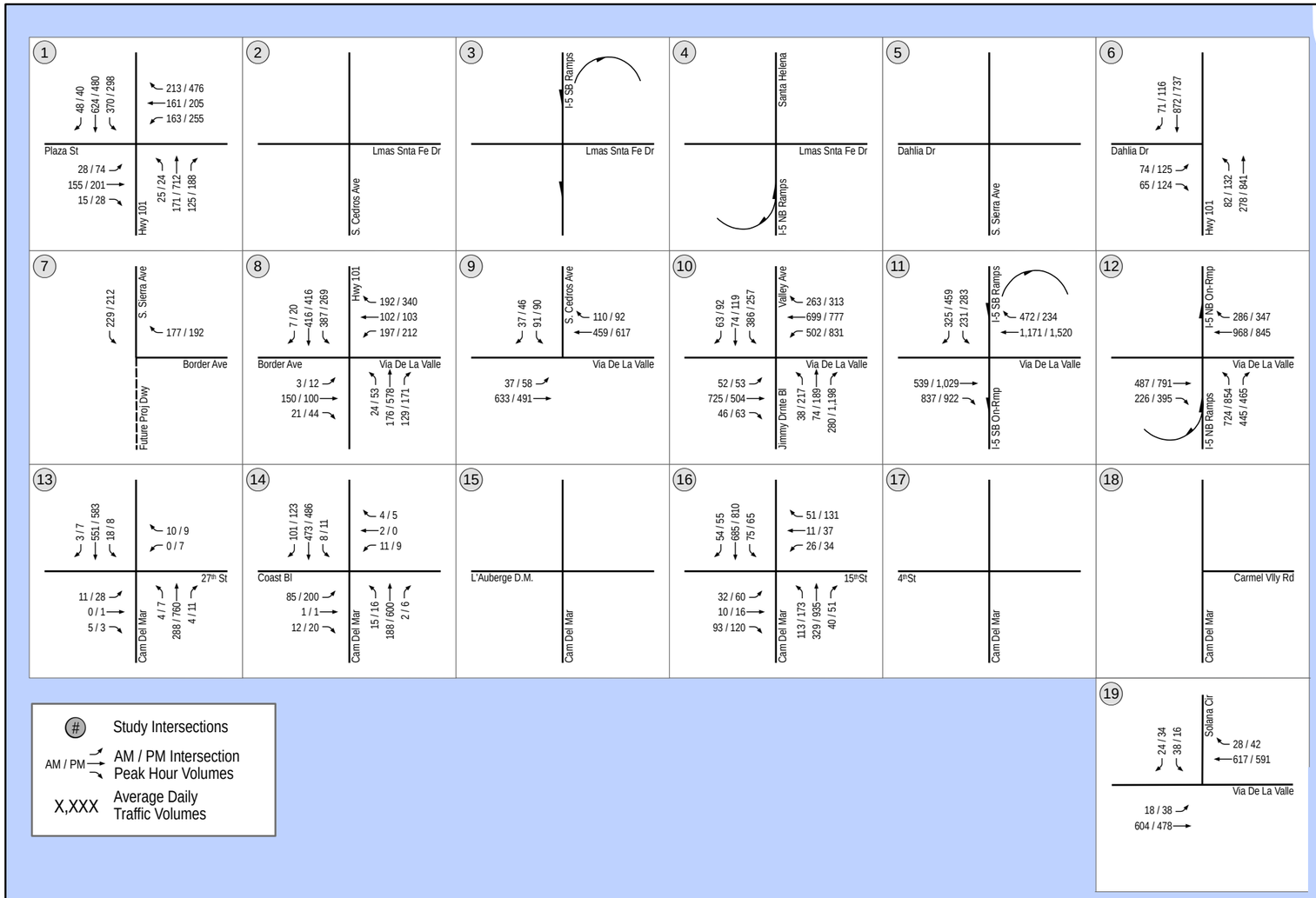

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Figure 7-5

Existing + Cumulative Projects Traffic Volumes

Weekday - During Fair

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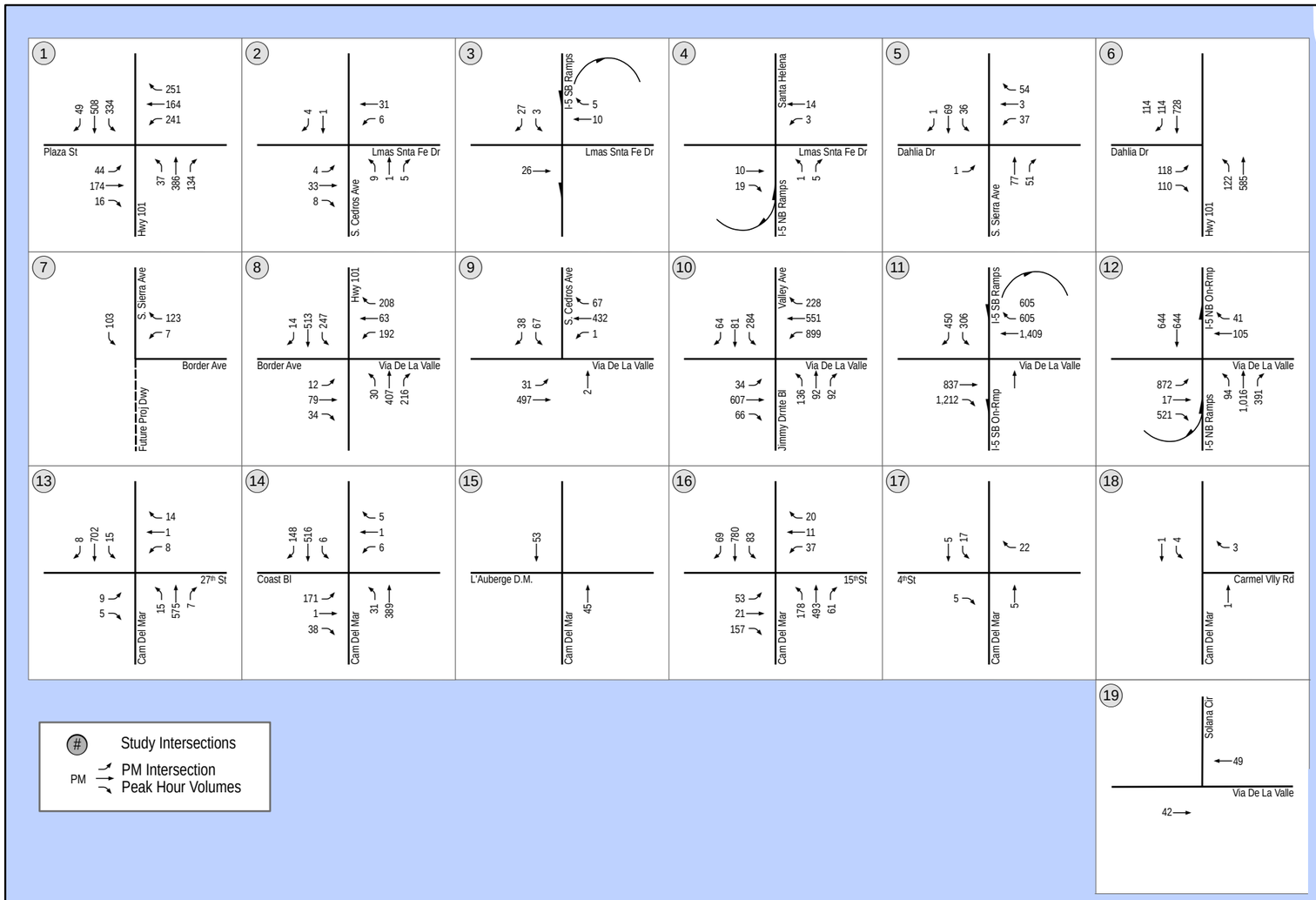

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Figure 7-6

Existing + Cumulative Projects Traffic Volumes

Weekend - During Fair

DEL MAR RESORT

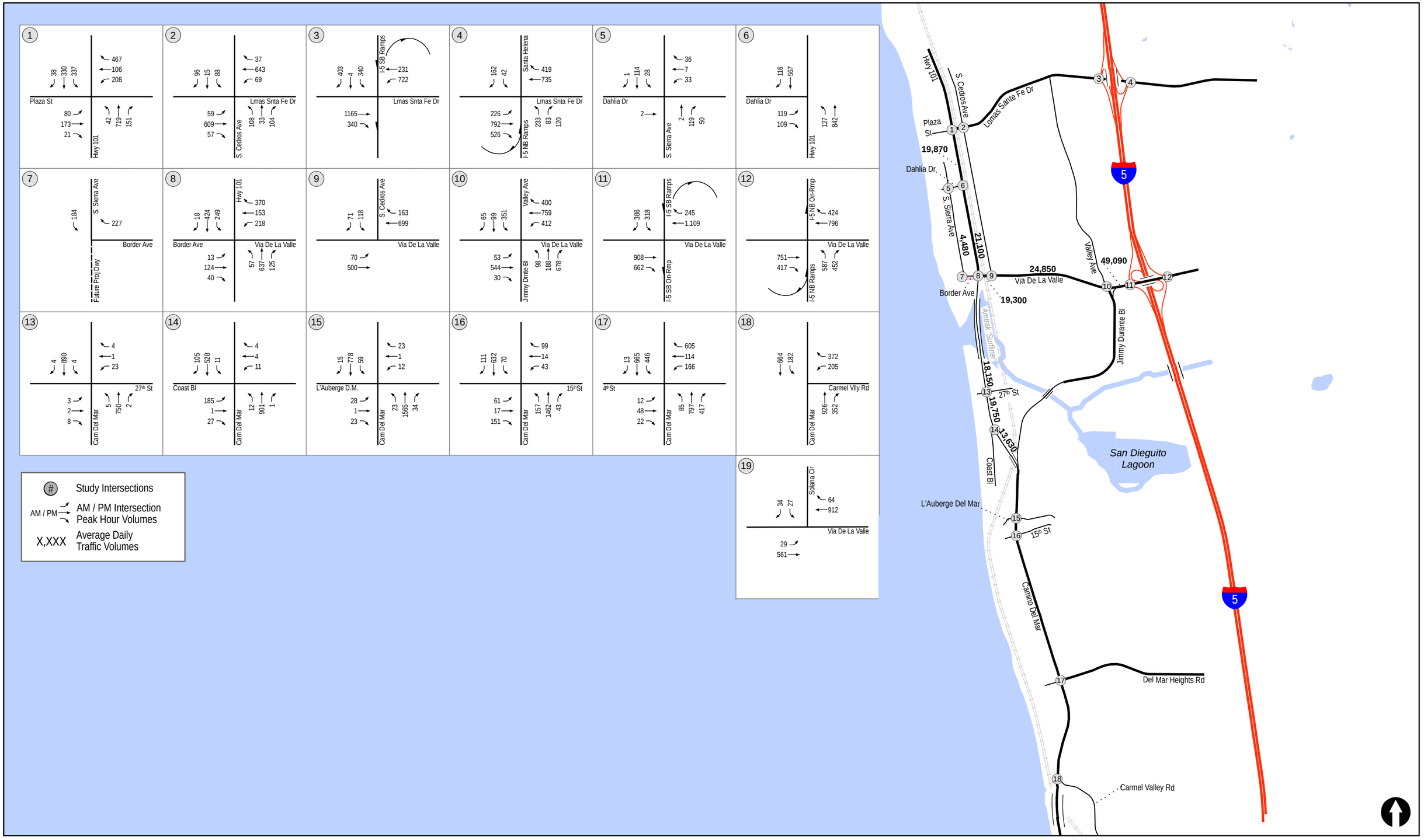

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Figure 7-7

Existing + Cumulative Projects Traffic Volumes

Weekday - During Horse Races

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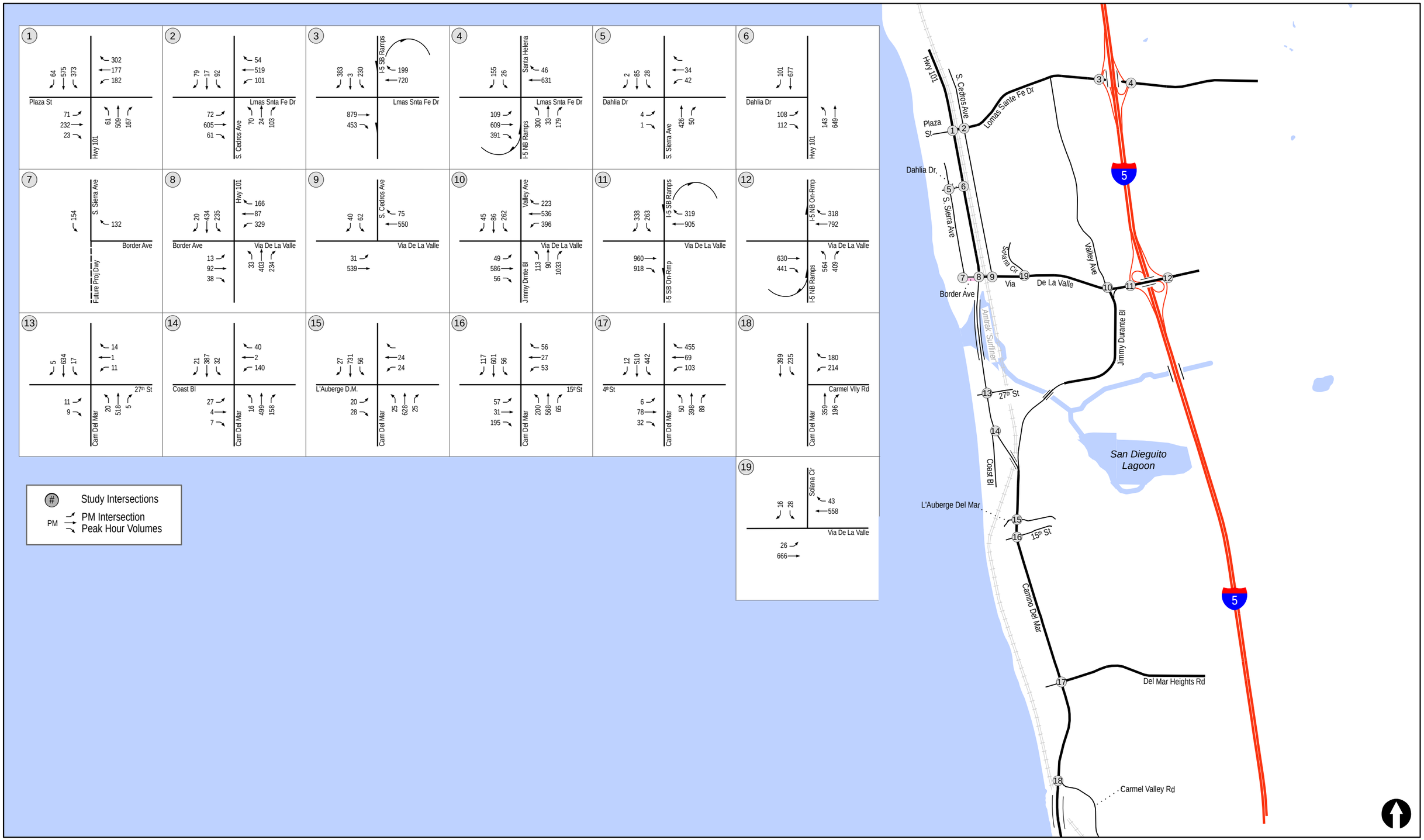

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Figure 7-8

Existing + Cumulative Projects Traffic Volumes

Weekend - During Horse Races

DEL MAR RESORT

8.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

8.1 Trip Generation

Weekday rates and splits for Resort Hotel and Villas land uses are based on the *(Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002, published by SANDAG. The following is a description of the trip rates used for each land use:

Weekday

- The SANDAG trip rates were used for the Hotel Rooms and the detached Villas
- No specific trip rates are available for the "Attached Villas". Therefore, the trip rates for condominiums were used.
- No specific SANDAG rates are available for "Affordable Housing"and "Shared Visitor Accommodation". Therefore, the rates for Apartment land use was used.

Weekend

SANDAG does not provide Weekend trip rates. Therefore, the trips rates from *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), was used.

- The Saturday rates for Land Use 310 - Hotel from *Trip Generation* was used for the Hotel Rooms since that is the closest description to the proposed land use.
- The Saturday rates for Land Use 210 - Single Family Homes from *Trip Generation* was used for Saturday for Detached Villas.
- The rates for Land Use 220 - Multi-family Housing (Low Rise) from *Trip Generation* for was used for "Affordable Housing" and "Shared Visitor Accommodation" since that is the closest description to the proposed land use.

The trip generation for the hotel was not reduced to account for walk/bike trips, employees using transit to reach the site or any other Transportation Demand Management (TDM) measures. In addition, trips were not reduced to account for workers living-on-site.

The attached Villas were assumed to generate trips similar to condominiums and therefore include trips generated by residents with jobs. The Attached Villas are single ownership and "resort - branded", i.e. they may be available for rent by the resort when the owner is not there. In reality, the Villa Hotel Rooms will house many folks that do not live year-round on-site and do not go to work each day during peak commuter periods. Even if these villas are rented, they may remain unoccupied for extended periods of time, since like any hotel, 100% occupancy is not guaranteed. Therefore, it is believed that the number of trips generated by the Villa Hotel Rooms is overstated, particularly during peak hours.

There are 27 attached villas and each Villa has three keys. In order to provide a worst-case analysis, the trip generation assumes each attached Villa includes three sets of guests and a total of 81 "guest units".

8.1.1 *Weekday Trip Generation*

As seen in ***Table 8-2***, the project is estimated to generate a total of 1,408 daily trips with 98 AM peak hour trips (50 inbound and 48 outbound) and 123 PM peak hour trips (63 inbound and 60 outbound).

8.1.2 *Weekend Trip Generation*

As seen in *Table 8-2*, the project is estimated to generate a total of 1,650 daily trips with 139 PM peak hour trips (71 inbound and 66 outbound).

8.2 Trip Distribution/Assignment

A Select Zone Assignment (SZA) plot was obtained from SANDAG. Based on this SZA plot, the project distribution was developed. The project traffic was assigned using this distribution. The project entrance is designed in such a way that traffic exiting the project driveway will not physically be able to turn to northbound S. Sierra Avenue. In addition, traffic will be discouraged from entering the site via Sierra Avenue, but it is not possible to physically prohibit the movement. Therefore, to be conservative, a portion of the total inbound traffic was assigned to S. Sierra Avenue. All outbound traffic from the site is assigned to Highway 101.

The following figures are included at the end of this section:

- ***Figure 8–1*** depicts the project trip distribution percentages.
- ***Figure 8–2*** depicts the Weekday Project traffic assignment based on the distribution percentages shown on *Figure 8-1*.
- ***Figure 8–3*** depicts the Weekend Project traffic assignment based on the distribution percentages shown on *Figure 8-1*.
- ***Figure 8–4*** depicts the Existing + Project (Typical Weekday) daily and AM & PM peak hour traffic volumes.
- ***Figure 8–5*** depicts the Existing + Project (Typical Weekend) peak hour traffic volumes.
- ***Figure 8–6*** depicts the Existing + Project (During Fair Weekday) daily and AM & PM peak hour traffic volumes.
- ***Figure 8–7*** depicts the Existing + Project (During Horse Races Weekday) daily and PM peak hour traffic volumes.
- ***Figure 8–8*** depicts the Existing + Project (During Horse Races Weekend) peak hour traffic volumes.
- ***Figure 8–9*** depicts the Existing + Cumulative projects + Project (Typical Weekday) daily and AM & PM peak hour traffic volumes.
- ***Figure 8–10*** depicts the Existing + Cumulative projects + Project (Typical Weekend) peak hour traffic volumes.
- ***Figure 8–11*** depicts the Existing + Cumulative projects + Project (During Fair Weekday) daily and AM & PM peak hour traffic volumes.
- ***Figure 8–12*** depicts the Existing + Cumulative projects + Project (During Horse Races Weekday) daily and PM peak hour traffic volumes.
- ***Figure 8–13*** depicts the Existing + Cumulative projects + Project (During Horse Races Weekend) peak hour traffic volumes.

TABLE 8-1
TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour					PM Peak Hour				
		Rate [a]	Volume	% of ADT	In:Out Split	Volume			% of ADT	In:Out Split	Volume		
						In	Out	Total			In	Out	Total
Weekday													
Hotel Rooms	65 Rooms	8 /Room	520	5%	60:40	13	13	26	7%	40:60	18	18	36
Attached Villas	81 DU	8 /DU	648	8%	20:80	26	26	52	10%	70:30	33	32	65
Detached Villas	4 DU	12 /DU	48	8%	30:70	2	2	4	10%	70:30	3	2	5
Affordable Housing [b]	22 DU	6 /DU	132	8%	20:80	6	5	11	9%	70:30	6	6	12
Shared Visitor Accommodation [b]	10 DU	6 /DU	60	8%	20:80	3	2	5	9%	70:30	3	2	5
Total Weekday Trips			**1,408**			**50**	**48**	**98**			**63**	**60**	**123**
Weekend													
Hotel Rooms [c]	65 Rooms	10.5 /Room	683	AM ANALYSIS WAS NOT CONDUCTED DURING THE WEEKEND					0.87	50:50	28	28	56
Attached Villas [d]	81 DU	8.14 /DU	659						0.70	54:46	31	26	57
Detached Villas [e]	4 DU	Ln(T) = 0.94 Ln(X) + 2.56	48						0.93	54:46	2	2	4
Affordable Housing [f]	22 DU	8.14 /DU	179						0.70	54:46	8	7	15
Shared Visitor Accommodation [f]	10 DU	8.14 /DU	81						0.70	54:46	4	3	7
Total Weekend Trips			**1,650**								**73**	**66**	**139**

Footnotes:

a. Weekday rates and splits for Resort Hotel, and Condominiums are based on the *(Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002, published by SANDAG. Weekend rates are based on the Saturday rates from *Trip Generation*, Institute of Transportation Engineers (ITE) 10th Edition.
b. No specific SANDAG weekday rates are available for Affordable Housing and Shared Visitor Accommodation. The rates for Apartment was used.
c. The Saturday rates for Land Use 310 - Hotel, *Trip Generation* was used for Resort hotel since that is the closest description to the proposed land use.
d. The Saturday rates for Land Use 220 - Multi-family Housing (Low Rise), *Trip Generation* was used for Affordable Housing since that is the closest description to the proposed land use.
e. The Saturday rates for Land Use 210 - Single Family Homes, *Trip Generation* was used for Saturday.
f. No specific ITE Saturday rates are available for Affordable Housing and Shared Visitor Accommodation. The rates for Land Use 220 - Multi-family Housing (Low Rise), *Trip Generation* was used.

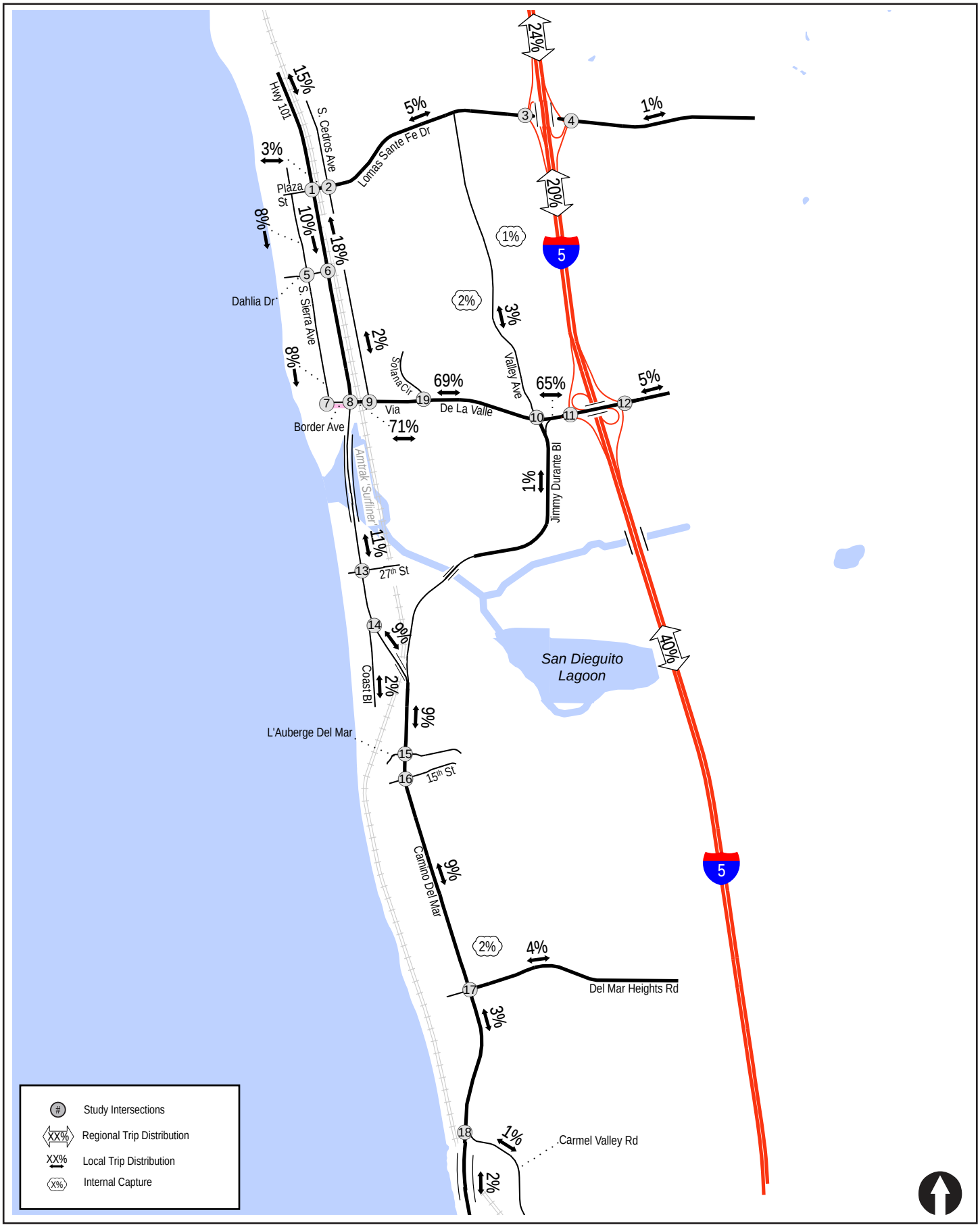

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Figure 8-1

Project Traffic Distribution

DEL MAR RESORT

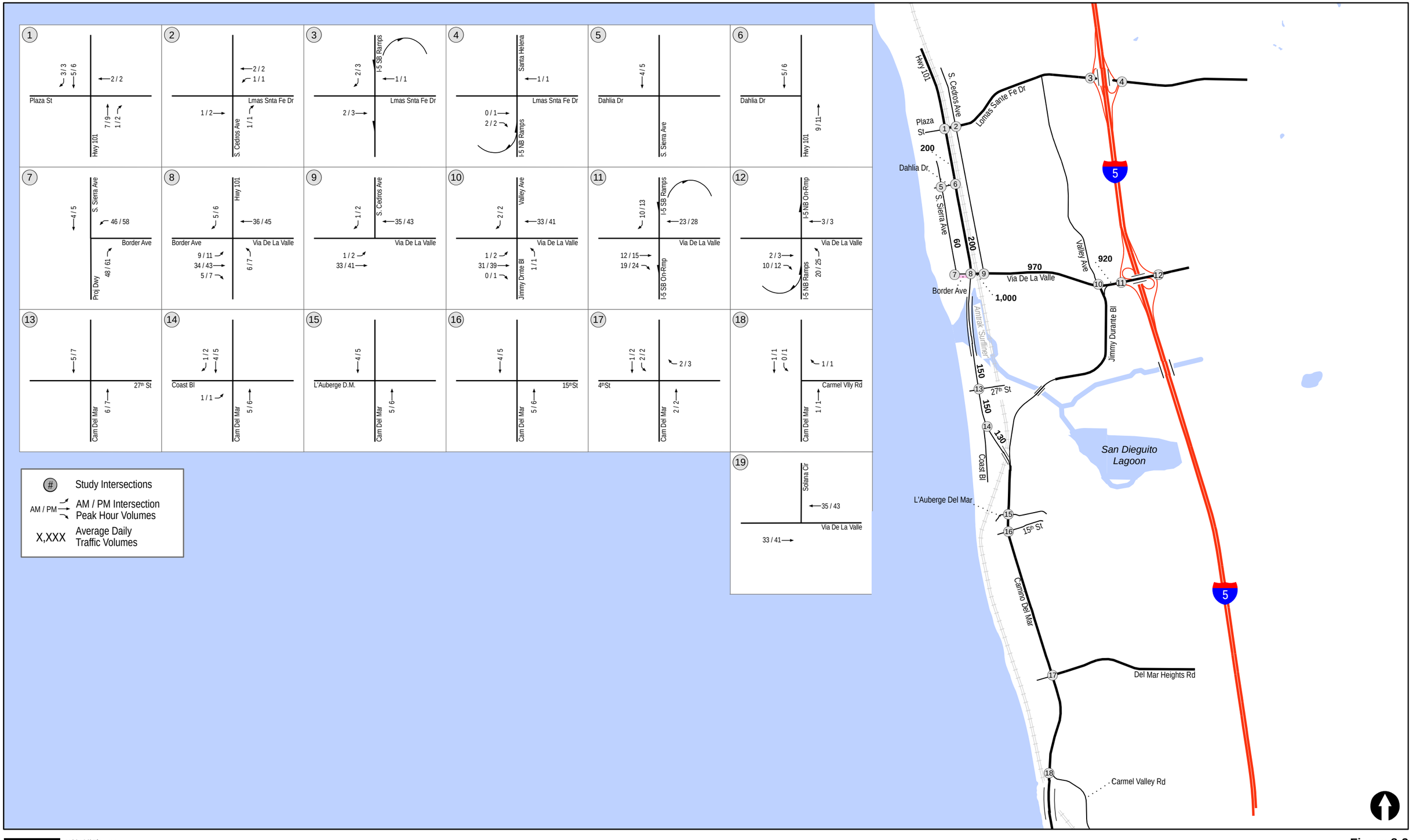

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Figure 8-2

Project Traffic Volumes

Typical Weekday

DEL MAR RESORT

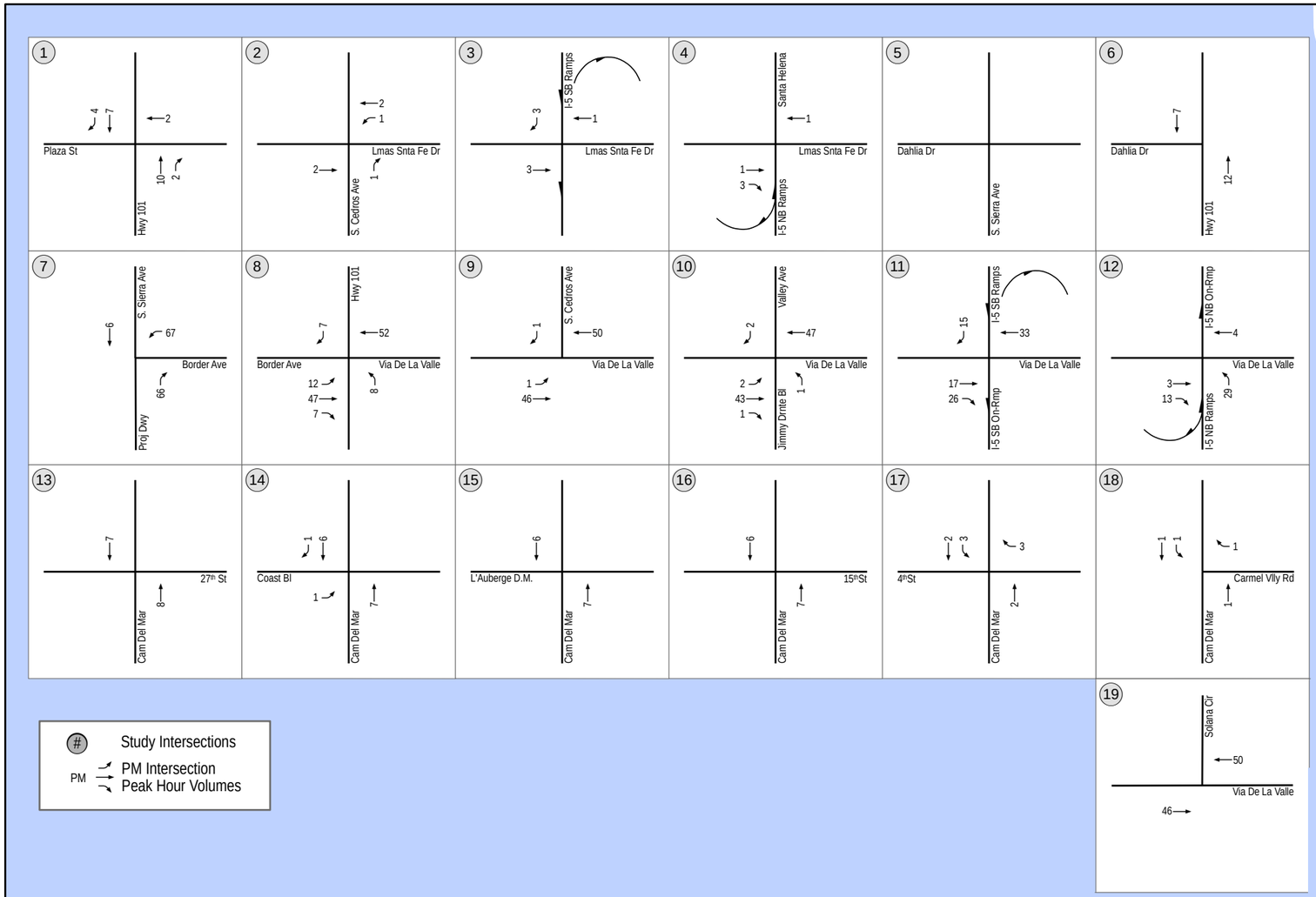

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Figure 8-3

Project Traffic Volumes

Typical Weekend

DEL MAR RESORT

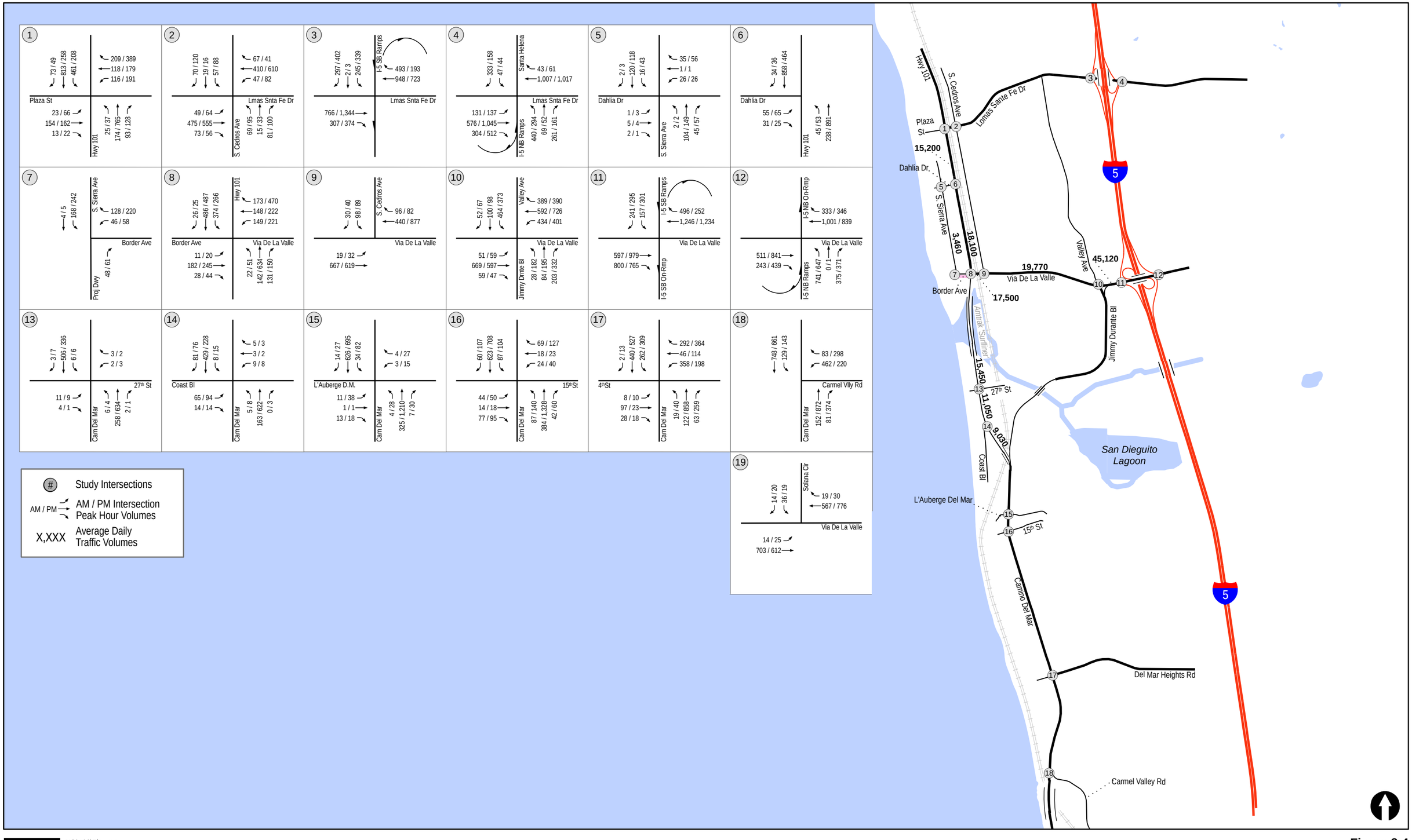

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Figure 8-4

Existing + Project Traffic Volumes

Typical Weekday

DEL MAR RESORT

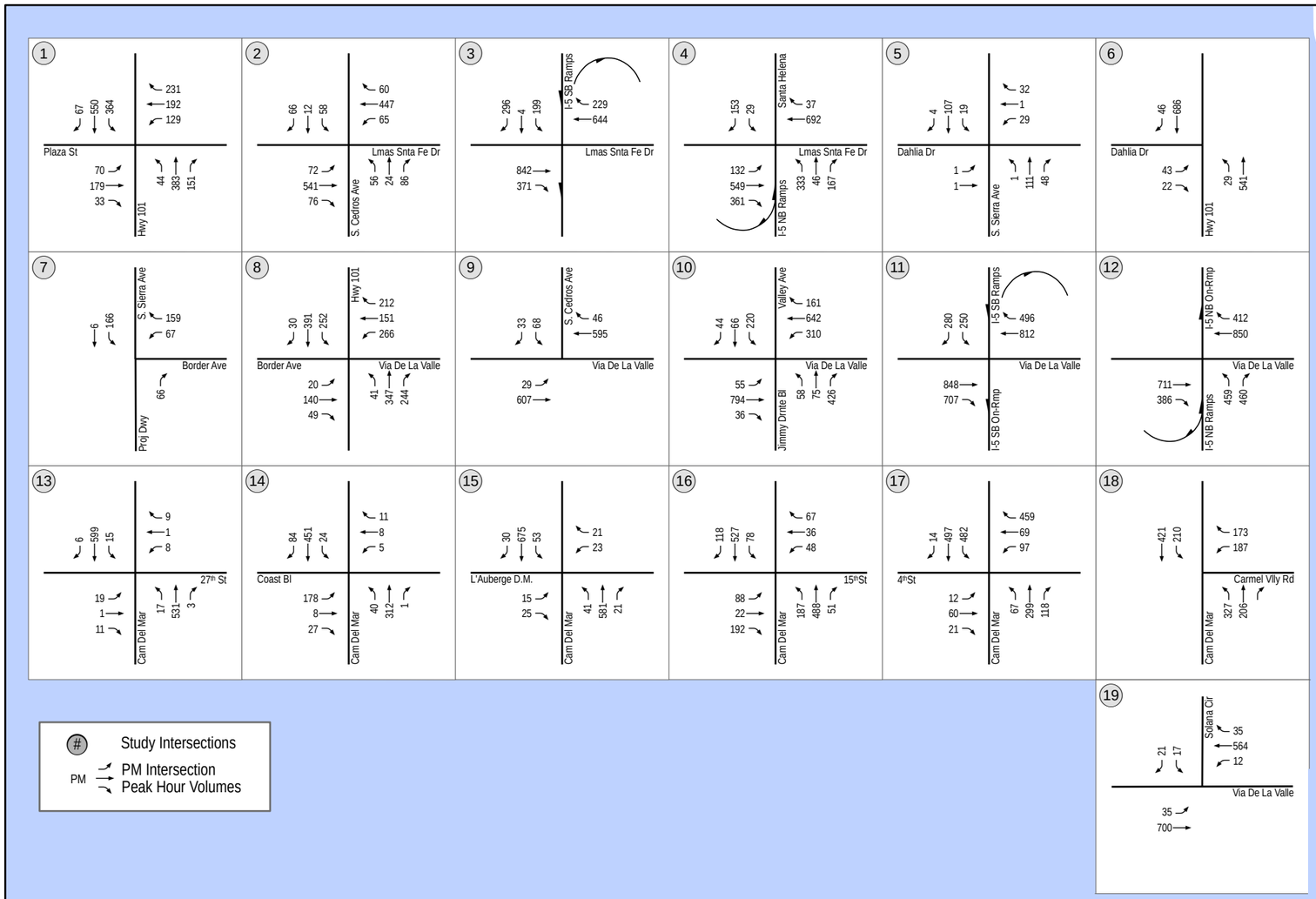

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Figure 8-5

Existing + Project Traffic Volumes

Typical Weekend

DEL MAR RESORT

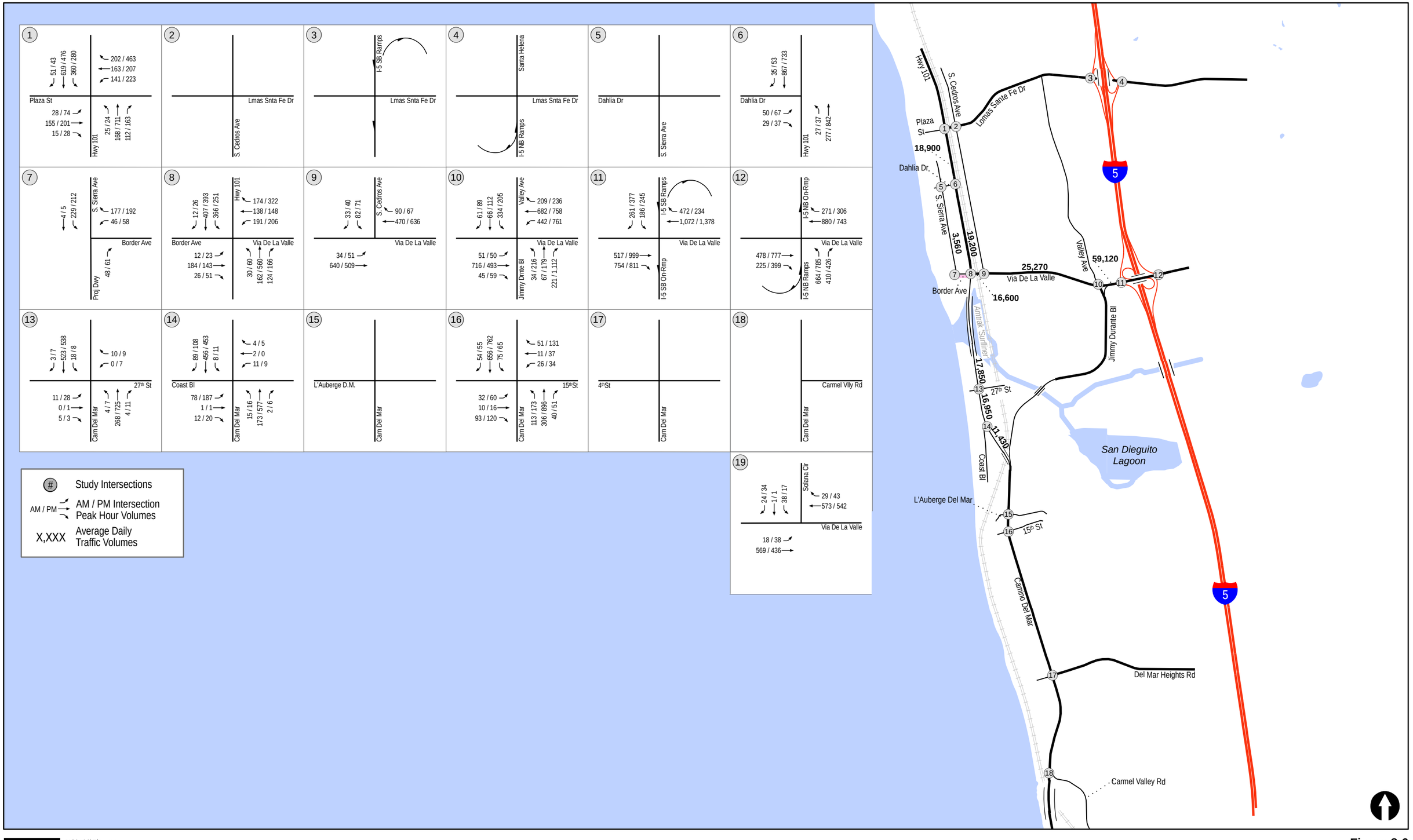

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Figure 8-6

Existing + Project Traffic Volumes

Weekday - During Fair

DEL MAR RESORT

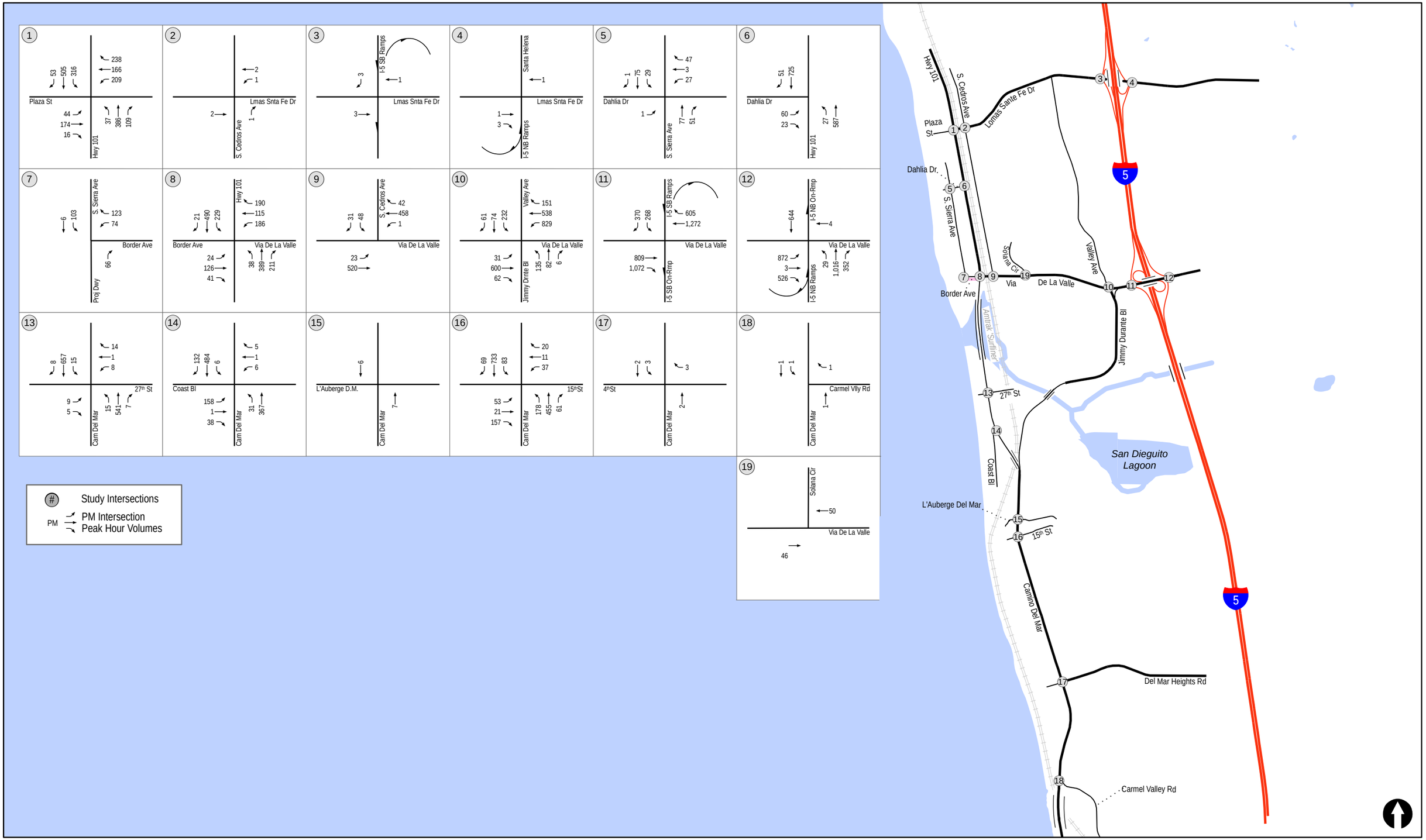

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Figure 8-7

Existing + Project Traffic Volumes

Weekend - During Fair

DEL MAR RESORT

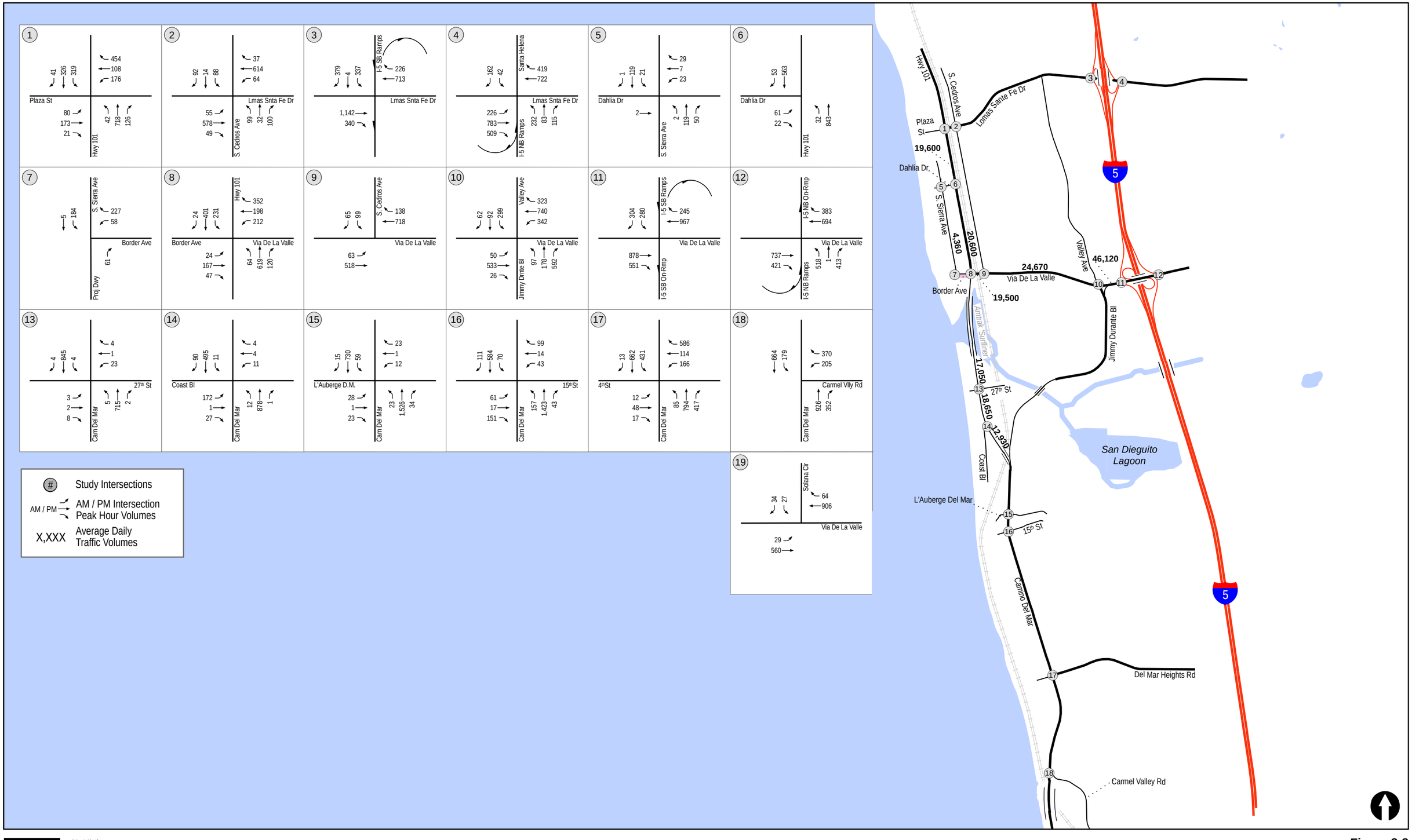

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Figure 8-8

Existing + Project Traffic Volumes

Weekday - During Horse Races

DEL MAR RESORT

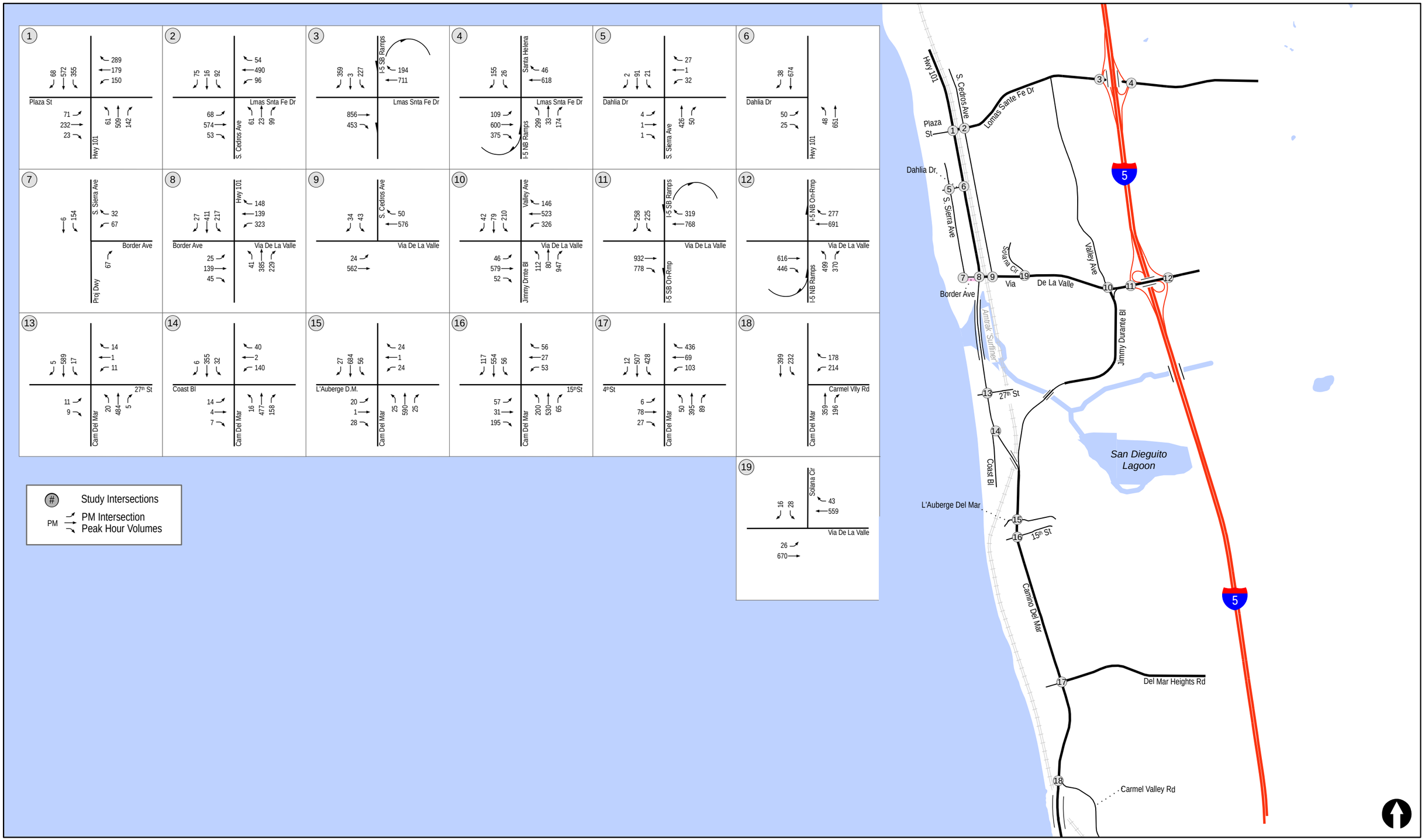

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Figure 8-9

Existing + Project Traffic Volumes

Weekend - During Horse Races

DEL MAR RESORT

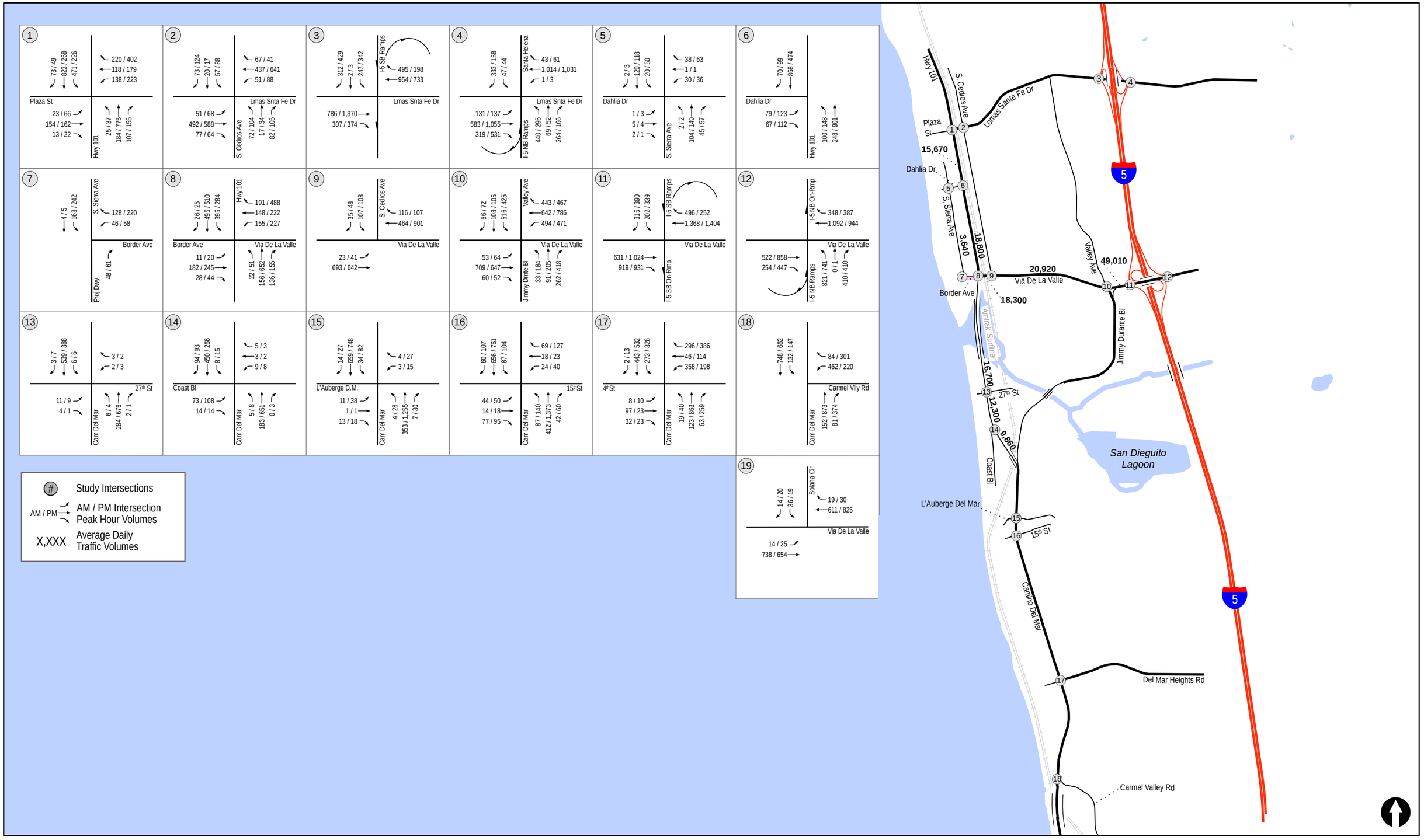

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Figure 8-10

Existing + Cumulative Projects + Project Traffic Volumes

Typical Weekday

DEL MAR RESORT

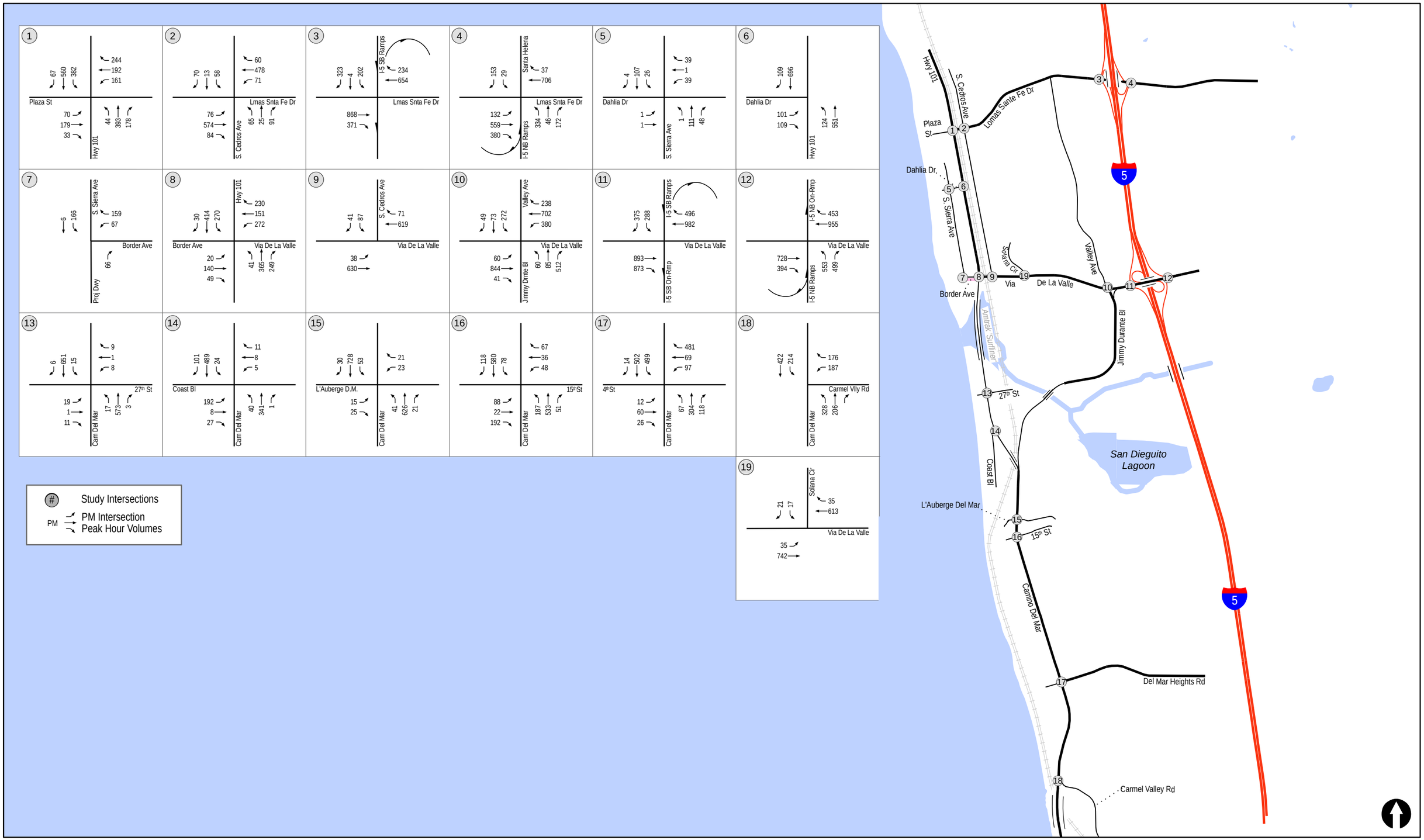

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Figure 8-11

Existing + Cumulative Projects + Project Traffic Volumes

Typical Weekend

DEL MAR RESORT

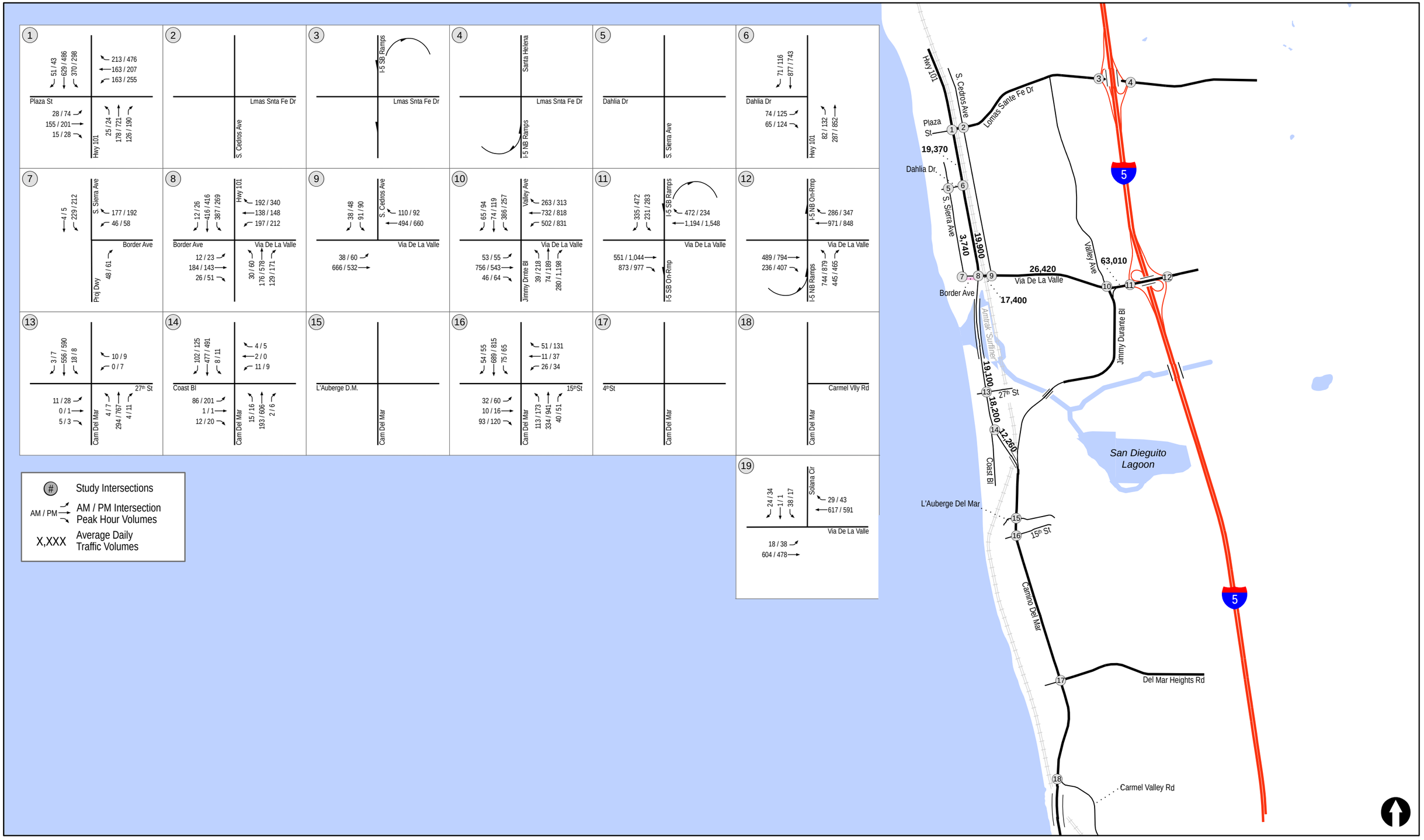

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Figure 8-12

Existing + Cumulative Projects + Project Traffic Volumes

Weekday - During Fair

DEL MAR RESORT

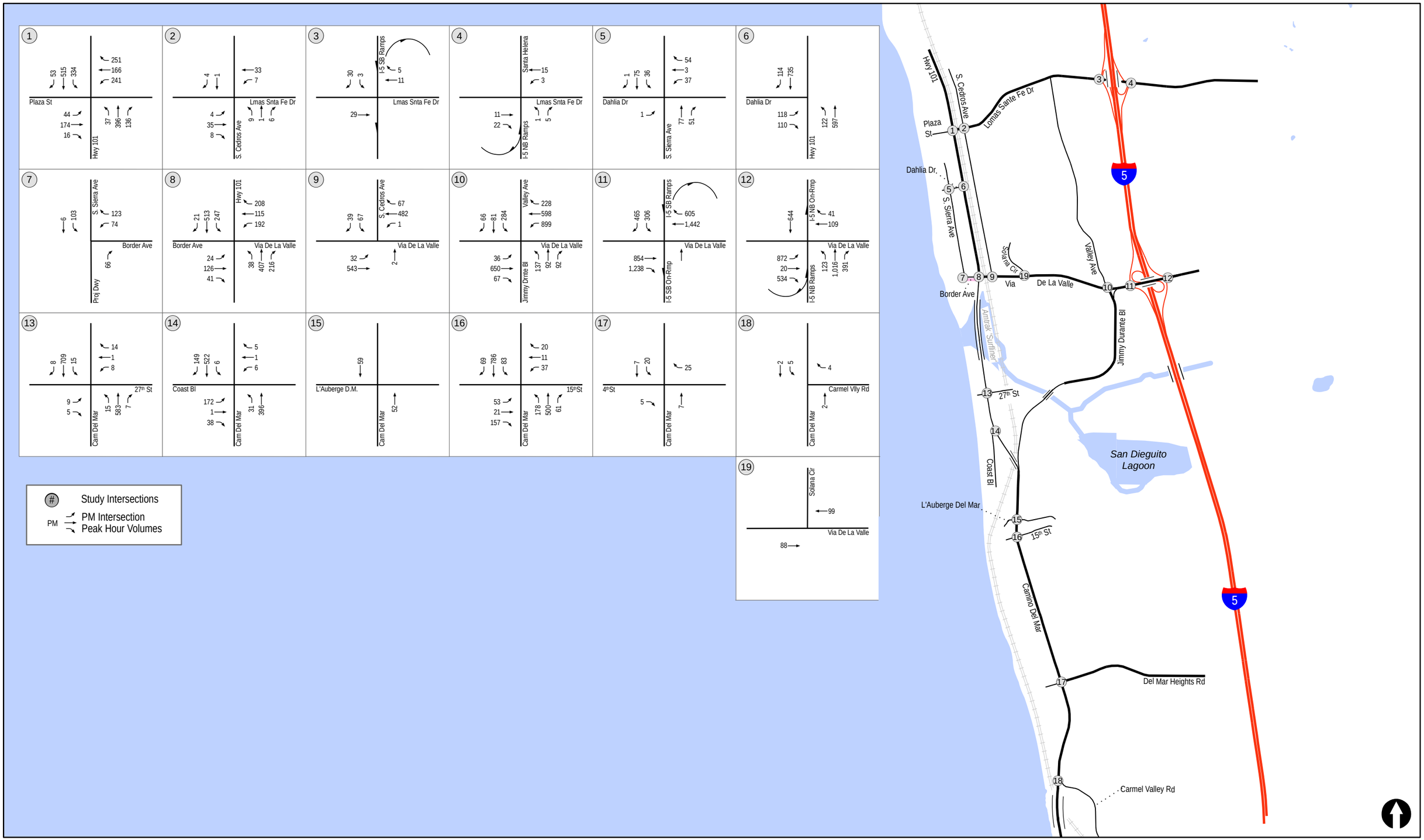

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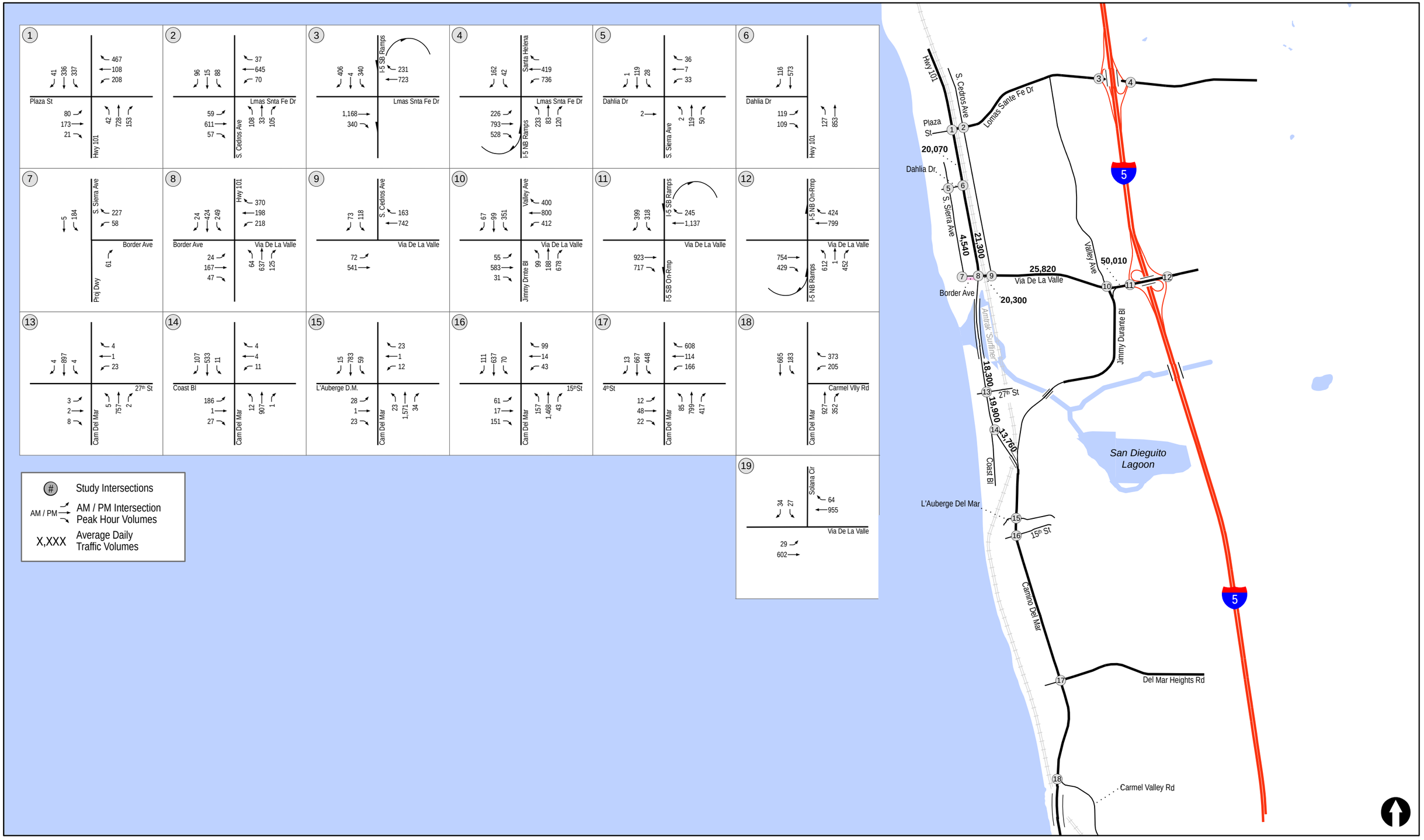
Figure 8-13

Existing + Cumulative Projects + Project Traffic Volumes

Weekend - During Fair

DEL MAR RESORT



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Date: 06/24/19

Figure 8-14

Existing + Cumulative Projects + Project Traffic Volumes

Weekday - During Races

DEL MAR RESORT

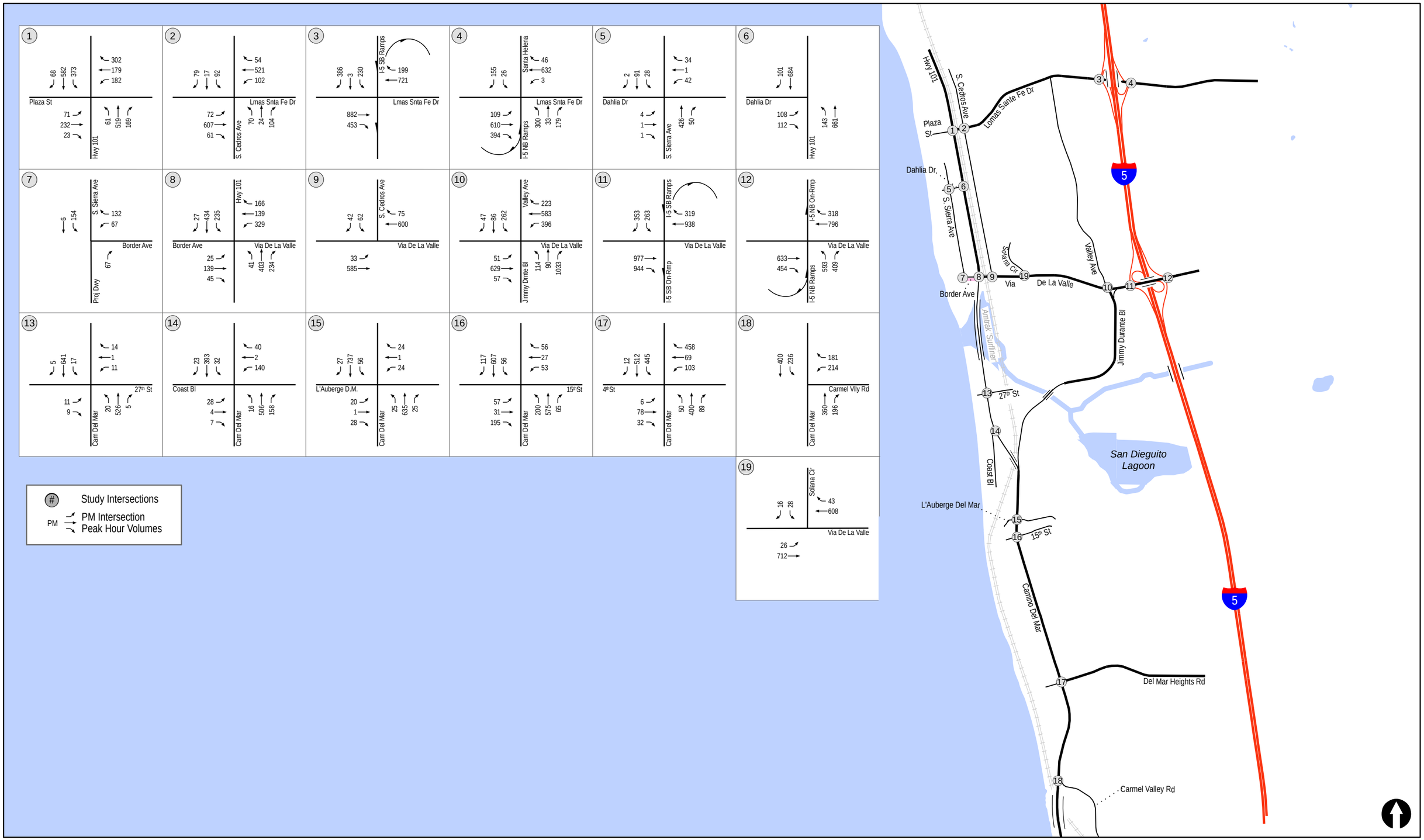

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Figure 8-15

Existing + Cumulative Projects + Project Traffic Volumes

Weekend - During Horse Races

DEL MAR RESORT

9.0 ANALYSIS OF NEAR-TERM SCENARIOS – TYPICAL WEEKDAY / WEEKEND

9.1 Existing + Project – Typical Weekday / Weekend

9.1.1 *Intersection Analysis*

Table 9–1 summarizes the Existing + Project – Typical Weekday / Weekend peak hour intersection operations. As seen in *Table 9–1*, on a Typical Weekday, with the addition of Project traffic, the following study area intersections are calculated to operate at LOS E or worse:

- **Via De La Valle / S. Cedros Avenue** (SB left-turn LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS E during the PM peak hour)

The increase in delay due to project traffic is less than the allowable 2.0 seconds at the Camino Del Mar / Del Mar Heights Road intersection. Hence, a significant direct impact is not calculated at this intersection. However, significant direct impacts are calculated at the remaining intersections.

On a Weekend, with the addition of Project traffic, the following study area intersections are calculated to operate at LOS E or worse:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS E during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the PM peak hour)

The increase in delay due to project traffic is less than the allowable 2.0 seconds at the Highway 101 / Lomas Santa Fe Drive and the Camino Del Mar / Del Mar Heights Road intersections. Hence, significant direct impacts are not calculated at these intersections. However, significant direct impacts are calculated at the remaining two intersections.

Appendix E-1 contains the Existing + Project – Typical Weekday peak hour intersection analysis worksheets and ***Appendix E-2*** contains the Existing + Project – Typical Weekend peak hour intersection analysis worksheets.

9.1.2 *Daily Street Segment Levels of Service*

Table 9–2 summarizes the Existing + Project – Typical Weekday segment operations. As seen in *Table 9–2*, with the addition of Project traffic, the following study area segments are calculated to operate at LOS E or worse:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS E)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS E)

The increase in V/C ratio due to the project traffic is less than the allowable 0.02 for the segment of Camino Del Mar between Via De La Valle and 27th Street and therefore the Project does not have a

significant impact on this segment. The potential impact on the Via de la Valle segments is explained below.

VIA DE LA VALLE

The segment of Via De La Valle is calculated currently operate at LOS F on a daily basis. This roadway was visited in the field during peak periods and further analyzed on a peak hour basis and it is noted that:

(1) The roadway is built to its ultimate classification per the City of Del Mar Community Plan,

(2) LOS D or better operations are calculated during the peak hours at the signalized intersections at each end of the study segment and

(3) LOS D or better operations are calculated using the HCM peak hour arterial analysis method.

As seen in *Table 9-1*, both signalized intersections along Via De La Valle at Highway 101 and Jimmy Durante Boulevard are calculated to operate at LOS D or better.

The increase in V/C on the segments along Via De La Valle due to Project traffic indicates a potential significant impact. ***Table 9-3*** summarizes the peak hour arterial analysis along Via De La Valle on a Typical Weekday. As seen in *Table 9-3*, the level of service based on the calculated speed along this corridor of Via De La Valle between I-5 and Highway 101 is LOS D or better. Since peak hour intersection operations are more indicative of actual operations than ADT operations, based on the peak hour arterial analysis, no significant direct impact is calculated on Via de la Valle.

Appendix G-3 contains the Existing and Existing + Project peak hour arterial analysis worksheets.

9.1.3 *Freeway Mainline Segments*

Table 9–4 summarizes the Existing + Project – Typical Weekday Freeway Mainline segment operations. As seen in *Table 9–4*, on a Typical Weekday, with the addition of Project traffic, the following Freeway Mainline segments are calculated to operate at LOS E or worse:

- **I-5: Lomas Santa Fe Drive and Via De La Valle** – LOS F(0) in the NB direction during the PM peak hour
- **I-5: Via De La Valle and Del Mar Heights Road** – LOS E in the in the SB direction during the AM peak hour and LOS F(0) in the NB direction during the PM peak hour

The increase in V/C ratio due to the project traffic is less than the allowable 0.01 for segments operating at LOS E. Hence, no significant direct impacts are calculated.

9.1.4 *Freeway Metered On-Ramps*

Table 9–5 summarizes the Existing + Project – Typical Weekday Metered On-Ramp operations using the fixed rate analysis methodology. As shown in *Table 9–5*, no delay is calculated during the AM and PM peak hours using this methodology. This is due to the fact that the ramp meter discharge rate exceeds the peak hour demand. It is widely accepted among the industry that this methodology lacks accuracy in depicting "real world" conditions and often grossly overstates the calculated queues and delays.

9.1.5 *Queuing Analysis*

A queuing analysis was conducted to determine the increase in queues due to project traffic on the existing PM peak hour queues at select closely spaced intersections. The intersections in the Lomas Santa Fe Drive and Via de la Valle corridors between Highway 101 and the I-5 NB ramps were selected for this queuing analysis. The following intersections are included in this analysis:

LOMAS SANTA FE DRIVE CORRIDOR

1. Hwy 101/ Lomas Santa Fe Drive
2. Cedros Avenue/ Lomas Santa Fe Drive
3. I-5 SB Ramps/ Lomas Santa Fe Drive
4. I-5 NB Ramps/ Lomas Santa Fe Drive

VIA DE LA VALLE CORRIDOR

7. Border Avenue /S. Sierra Avenue / Project Driveway
8. Hwy 101 (Border Avenue)/Via De La Valle (Camino del Mar)
9. Via de la Valle / S. Cedros Avenue
10. Via de la Valle / Jimmy Durante Avenue
11. I-5 SB Ramps / Via de la Valle
12. I-5 NB Ramps / Via de la Valle

Table 9-6 summarizes the results of the queuing analysis. As seen in *Table 9-6*, currently, the calculated 95th percentile queue length exceeds the available storage in a few movements at the subject intersections. With the addition of Project traffic, the queue lengths increase by less than 10 feet in most movements at these intersections, where the queue currently exceeds the available storage length. The increase in the calculated queue length is greater than 10 feet in two movements at the following two intersections:

- The westbound left-turn movement at the Hwy 101 (Border Avenue)/Via De La Valle (Camino del Mar) intersection.
- The westbound through movement at the Via de la Valle / Jimmy Durante Avenue intersection

See Section 19.5 for post mitigation queue analysis.

TABLE 9–1
EXISTING + PROJECT INTERSECTION OPERATIONS – TYPICAL WEEKDAY / WEEKEND

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay AM	32.8	C	33.5	C	0.7	None
		WkDay PM	41.8	D	42.2	D	0.4	None
		WkEnd PM	60.3	E	61.0	E	0.7	None
2. Cedros Avenue / Lomas Santa Fe Dr	Signal	WkDay AM	33.4	C	33.6	C	0.2	None
		WkDay PM	21.7	C	21.8	C	0.1	None
		WkEnd PM	20.7	C	20.7	C	0.0	None
3. I-5 SB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	14.8	B	14.9	B	0.1	None
		WkDay PM	29.4	C	29.7	C	0.3	None
		WkEnd PM	12.4	B	12.5	B	0.1	None
4. I-5 NB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	16.1	B	16.2	B	0.1	None
		WkDay PM	14.3	B	14.4	B	0.1	None
		WkEnd PM	13.1	B	13.1	B	0.0	None
5. S. Sierra Ave / Dahlia Dr	AWSC [d]	WkDay AM	8.0	A	8.0	A	0.0	None
		WkDay PM	8.6	A	8.6	A	0.0	None
		WkEnd PM	8.0	A	8.0	A	0.0	None
6. Hwy 101 / Dahlia Dr	Signal	WkDay AM	7.7	A	7.7	A	0.0	None
		WkDay PM	5.9	A	5.9	A	0.0	None
		WkEnd PM	6.2	A	6.2	A	0.0	None

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TABLE 9–1 (CONTINUED)
EXISTING + PROJECT INTERSECTION OPERATIONS – TYPICAL WEEKDAY / WEEKEND

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
7. Border Ave / S. Sierra Ave	[e]	WkDay AM	[e]	[e]	8.5	A	NA	None
		WkDay PM	[e]	[e]	8.5	A	NA	None
		WkEnd PM	[e]	[e]	9.1	A	NA	None
8. Hwy 101 (Border Ave) / Via De La Valle (Camino Del Mar)	Signal	WkDay AM	13.4	B	13.8	B	0.4	None
		WkDay PM	29.1	C	29.3	C	0.2	None
		WkEnd PM	23.3	C	23.9	C	0.6	None
9. Via De La Valle/ S. Cedros Ave	MSSC [f]	WkDay AM	21.8	C	23.3	C	1.5	None
		WkDay PM	33.0	D	**36.5**	**E**	**3.5**	**Direct**
		WkEnd PM	22.9	C	24.9	C	2.0	None
10. Via De La Valle/ Jimmy Durante Blvd	Signal	WkDay AM	36.7	D	37.7	D	1.0	None
		WkDay PM	40.1	D	42.1	D	2.0	None
		WkEnd PM	29.6	C	30.2	C	0.6	None
11. Via De La Valle / I-5 SB Ramps	Signal	WkDay AM	10.4	B	10.8	B	0.4	None
		WkDay PM	11.1	B	11.5	B	0.4	None
		WkEnd PM	9.8	A	10.0	A	0.2	None

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TABLE 9–1 (CONTINUED)
EXISTING + PROJECT INTERSECTION OPERATIONS – TYPICAL WEEKDAY / WEEKEND

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
12. Via De La Valle / I-5 NB Ramps	Signal	WkDay AM	24.2	C	24.4	C	0.2	None
		WkDay PM	27.0	C	27.5	C	0.5	None
		WkEnd PM	24.8	C	25.3	C	0.5	None
13. Camino Del Mar/ 27th St	AWSC	WkDay AM	16.2	C	16.5	C	0.3	None
		WkDay PM	28.9	D	30.2	D	1.3	None
		WkEnd PM	34.5	D	**36.2**	**E**	**1.7**	**Direct**
14. Camino Del Mar/ Coast Blvd	AWSC	WkDay AM	15.0	B	15.7	C	0.7	None
		WkDay PM	**62.0**	**F**	**65.4**	**F**	**3.4**	**Direct**
		WkEnd PM	30.2	D	31.7	D	1.5	None
15. Camino Del Mar/ L'Auberge Del Mar	Signal	WkDay AM	6.4	A	6.4	A	0.0	None
		WkDay PM	10.6	B	10.6	B	0.0	None
		WkEnd PM	8.9	A	8.9	A	0.0	None
16. Camino Del Mar/ 15th St	Signal	WkDay AM	21.8	C	21.8	C	0.0	None
		WkDay PM	31.8	C	32.1	C	0.3	None
		WkEnd PM	33.3	C	33.6	C	0.3	None

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TABLE 9–1 (CONTINUED)
EXISTING + PROJECT INTERSECTION OPERATIONS –TYPICAL WEEKDAY / WEEKEND

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
17. Camino Del Mar/ Del Mar Heights Rd	MSSC	WkDay AM	32.8	C	33.0	C	0.2	None
		WkDay PM	77.5	E	78.2	E	0.7	None
		WkEnd PM	129.0	F	129.9	F	0.9	None
18. Camino Del Mar/ Carmel Valley Rd	Signal	WkDay AM	22.6	C	23.1	C	0.5	None
		WkDay PM	22.6	C	23.1	C	0.5	None
		WkEnd PM	12.2	B	12.3	B	0.1	None
19. Via de La Valle / Solana Circ	MSSC	WkDay AM	19.0	C	19.9	C	0.9	None
		WkDay PM	18.9	C	19.9	C	1.0	None
		WkEnd PM	15.4	C	16.2	C	0.8	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to the Project.
d. AWSC – All-Way Stop Controlled intersection. Minor street left turn delay is reported.
e. Turn in the road. No traffic control exists.
f. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay is reported.

General Notes:

WkDay AM – Weekday AM
WkDay PM – Weekday PM
WkEnd PM – Weekend Peak

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 9–2
EXISTING + PROJECT STREET SEGMENT OPERATIONS – TYPICAL WEEKDAY

Street Segment	Functional Classification [a]	Capacity (LOS E)	Existing			Existing + Project			Δ V/C [e]	Impact Type
			ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C		
S. Sierra Avenue										
Del Mar Shore Ter to Beach Club Dr	Minor Collector	8,000	3,400	B	0.425	3,460	B	0.433	0.008	None
Highway 101										
Lomas Santa Fe Dr to Dahlia Dr	4-lane Major Art	37,000	15,000	B	0.405	15,200	B	0.411	0.006	None
Dahlia Dr to Via De La Valle	4-lane Major Art	37,000	17,900	B	0.484	18,100	B	0.489	0.005	None
Camino Del Mar										
Via De La Valle to 27th St	Comm Collector	19,000	15,300	E	0.805	15,450	E	0.813	0.008	None
27th St to Coast Blvd	Comm Collector	19,000	10,900	B	0.574	11,050	B	0.582	0.008	None
Coast Blvd to Jimmy Durante Blvd	Comm Collector	19,000	8,900	A	0.468	9,030	A	0.475	0.007	None
Via De La Valle										
Hwy 101 to S. Cedros Ave	Town Collector	19,000	16,500	E	0.868	17,500	E	0.921	0.053	None [f]
S. Cedros Ave to Jimmy Durante Blvd	Town Collector	19,000	18,800	E	0.989	19,770	F	1.041	0.052	None [f]
Jimmy Durante Blvd to I-5 SB Ramps	4-Ln Major Arterial [g]	50,000	44,200	E	0.884	45,120	E	0.902	0.018	None [f]

Footnotes:

a. The San Diego County capacity at which the roadway currently functions.
b. Existing daily segment volumes from *Table 3-2*.
c. Level of Service.
d. The Volume / Capacity ratio.
e. Increase in V/C ratio due to the addition of project traffic.
f. Not an impact. See text for explanation.
g. A third eastbound through lane is provided along this segment, which merges into the I-5 SB on-ramp. Hence the capacity of an additional lane is assumed.

TABLE 9–3
EXISTING + PROJECT PEAK HOUR ARTERIAL ANALYSIS – TYPICAL WEEKDAY
VIA DE LA VALLE: HIGHWAY 101 (CAMINO DEL MAR) TO I-5 RAMPS

Direction	Existing						Existing + Project					
	AM			PM			AM			PM		
	Time [a]	Speed [b]	LOS	Time	Speed	LOS	Time	Speed	LOS	Time	Speed	LOS
Eastbound	117.9	25.6	C	120.3	25.1	C	118.8	25.5	C	121	25.0	C
Westbound	118.7	25.5	C	133.3	22.7	C	120.2	25.2	C	135.7	22.3	C

Footnotes:

a. Travel time in seconds
b. Speed in miles per hour.

TABLE 9–4
EXISTING + PROJECT FREEWAY MAINLINE SEGMENT OPERATIONS – TYPICAL WEEKDAY

Freeway Segment	Dir	# of Lanes	Hourly Cap [a]	AADT	Peak Hour Traffic						V/C [d]				LOS		Δ V/C	
					Existing [b]		Project [c]		Existing + Project		Existing		Existing + Project					
					AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Interstate 5																		
Lomas Santa Fe Drive to Via De La Valle	NB	4ML + 1HOV + 1Aux	9,200	204,540	7,334	9,586	10	12	7,344	9,598	0.797	1.042	0.798	1.043	C	F(0)	0.001	0.001
	SB	5ML + 1Aux	10,000		9,162	7,919	10	13	9,172	7,932	0.916	0.792	0.917	0.793	D	C	0.001	0.001
Via De La Valle to Del Mar Heights Road	NB	4ML + 1HOV + 1Aux	9,200	210,160	7,528	9,839	20	25	7,548	9,864	0.818	1.069	0.820	1.072	D	F(0)	0.002	0.003
	SB	5ML + 1HOV	10,000		9,404	8,129	19	24	9,423	8,153	0.940	0.813	0.942	0.815	E	D	0.002	0.002
Del Mar Heights Road to SR 56	NB	6ML + 1Aux+1HOV	12,800	176,660	6,325	8,267	20	25	6,345	8,292	0.494	0.646	0.496	0.648	B	C	0.002	0.002
	SB	5ML + 1Aux+1HOV	11,000		7,901	6,829	19	24	7,920	6,853	0.718	0.621	0.720	0.623	C	C	0.002	0.002

Footnotes:

a. Capacity calculated at 1800 vph per lane and 1000 vph per Auxiliary lane and HOV lane as explained in the text.
b. Existing Average Annual Daily Traffic Volumes from Caltrans PeMS June 2017).
c. Project traffic at the ramps.
d. V/C = (Peak Hour volume/Capacity)

LOS	v/c
A	<0.41
B	0.62
C	0.80
D	0.92
E	1.00
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 9–5
NEAR-TERM METERED RAMPS OPERATIONS – TYPICAL WEEKDAY

Location/Condition	Peak Hour	Peak Hour Flow (F) (veh/hr/ln)	Calculated (Most Restrictive)			
			Discharge Rate [b] (veh/hr/ln)	Excess Demand E (veh/hr/ln)	Delay (min/ln)	Queue (ft)
EB Via De La Valle to SB I-5						1 SOV + 1 HOV
AM						
SOV						
Existing	665	996	0	0	0	0
Existing + Project	681	996	0	0	0	0
Existing + Cumulative	751	996	0	0	0	0
Existing + Cumulative Projects + Project	838	996	0	0	0	0
HOV [b]						
Existing	117	996	0	0	0	0
Existing + Project	120	996	0	0	0	0
Existing + Cumulative	133	996	0	0	0	0
Existing + Cumulative Projects + Project	148	996	0	0	0	0
PM						
SOV						
Existing	529	996	0	0	0	0
Existing + Project	549	996	0	0	0	0
Existing + Cumulative	643	996	0	0	0	0
Existing + Cumulative Projects + Project	758	996	0	0	0	0
HOV [b]						
Existing	93	498	0	0	0	0
Existing + Project	97	498	0	0	0	0
Existing + Cumulative	114	498	0	0	0	0
Existing + Cumulative Projects + Project	134	498	0	0	0	0
EB Via De La Valle to NB I-5						2 SOV
PM						
SOV						
Existing	209	372	0	0	0	0
Existing + Project	221	372	0	0	0	0
Existing + Cumulative	213	372	0	0	0	0
Existing + Cumulative Projects + Project	217	372	0	0	0	0

Footnotes:

a. Existing volumes - Average of volumes from March through April 2017, from PeMS.
b. Discharge rates obtained from Caltrans (*Appendix A*).
c. A 15% Reduction in volume is applied to the volume in SOV lanes due to HOV lane

General Notes:

SOV – Single Occupancy Vehicle Lane
HOV – High Occupancy Vehicle Lane

TABLE 9-6
PM PEAK HOUR FORECASTED QUEUE IN FEET (95TH PERCENTILE)

Intersection	Movement	Storage Length (Feet)	Existing	Existing + Project
1. Hwy 101/ Lomas Santa Fe Dr	SB Through	>500	134	137
	SB Left to EB	335	*#359*	*#359*
	WB Right to NB	220	54	54
	WB Through	220	134	139
	WB Left to SB	100 [b]	*111*	*111*
	NB Through	>800	#564	#576
	NB Left to WB	200	73	73
	EB Through	170	145	145
2. Cedros Ave/ Lomas Santa Fe Dr	SB Right to WB	100	31	31
	SB Through	>300	17	17
	SB Left to EB	65	63	63
	WB Right to NB	265	9	9
	WB Through	265	196	196
	WB Left to SB	80	*87*	*88*
	NB Through	>300	45	45
	NB Left to WB	70	66	65
	EB Through	220	198	199
	EB Left to NB	70	73	73
3. I-5 SB Ramps/ Lomas Santa Fe Dr	SB Right to WB	>400	261	266
	SB Left to EB	>400	#508	#508
	WB Through	>600	252	253
	EB Through	340	745	747
4. I-5 NB Ramps/ Lomas Santa Fe Dr	WB Through	430	337	337
	NB Right to EB	610	90	90
	NB Through	610 [c]	202	202
	NB Left to WB	610	196	196
	EB Left to NB	200	*#208*	*#208*
	EB Through	650	*#830*	*#833*
7. Border Ave/S. Sierra Ave/ Proj Dwy	WB Left to SB	70	DNE	3
	NB Right to EB	50	DNE	5
8. Hwy 101 (Border Ave)/ Via De La Valle (Camino del Mar)	SB Through	>500	193	194
	SB Left to EB	300	*307*	*307*
	WB Right to NB	120	113	113
	WB Through	300	162	203
	WB Left to SB	120	**#282**	**#309**
	NB Right to EB	90	90	92
	NB Through	>500	324	324
	NB Left to WB	100	77	86
	EB Through	300	224	287

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TABLE 9-6 (CONTINUED)
PM PEAK HOUR FORECASTED QUEUE IN FEET (95TH PERCENTILE)

Intersection	Movement	Storage Length (Feet)	Existing	Existing + Project
9. Via de la Valle / S. Cedros Ave	SB Right to WB	60	13	15
	SB Left to EB	>200	100	55
	EB Left to NB	90	5	5
19. Via de la Valle / Solana Circ	SB Right to WB	>100	12	13
	SB Left to EB	>100	12	13
	EB Left to NB	150	1	3
10. Via de la Valle / Jimmy Durante Ave	SB Lt to EB/Rt to WB	100	0	0
	SB Through	>300	115	115
	SB Left to EB	120	#253	#253
	WB Through	550	**#555**	**#598**
	WB Left to SB	130	#267	#267
	NB Right to EB	>400	40	40
	NB Through	>400	213	213
	NB Left to WB	170	*#285*	*#288*
	EB Through	>400	303	326
	EB Left to NB	125	*#126*	*#129*
11. I-5 SB Ramps / Via de la Valle	SB Right to WB	>500	153	167
	SB Left to EB	>500	163	172
	WB Through	>500	387	416
	EB Through	>500	202	215
12. I-5 NB Ramps / Via de la Valle	WB Through	>500	269	274
	NB Right to EB	>500	280	291
	NB Left to WB	>500	372	380
	EB Through	>500	462	475

Footnotes:

a. Shared through/right lane.
b. Per lane.
c. Shared through/left lane.

General Note:

- 95th percentile volume exceeds capacity. Queue may be longer. Queue shown after two cycles.

Bold indicates queue exceeds available storage

Bold indicates increase in the calculated queue exceeds 10 feet with the addition of Project traffic.

9.2 Existing + Cumulative Projects – Typical Weekday / Weekend

9.2.1 *Intersection Analysis*

Table 9-7 summarizes the Existing + Cumulative projects – Typical Weekday / Weekend peak hour intersection operations. As seen in *Table 9-7*, with the addition of Cumulative projects traffic the following study area intersections are calculated to operate at LOS E or worse during a Typical Weekday:

- **Via De La Valle / S. Cedros Avenue** (SB left-turn LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the PM peak hour)

On a Weekend, with the addition of Cumulative projects traffic, the following study area intersections are calculated operate at LOS E or worse:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS E during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS E during the PM peak hour)

Appendix F-1 contains the Existing + Cumulative Projects – Typical Weekday peak hour intersection analysis worksheets and ***Appendix F-2*** contains the Existing + Cumulative Projects – Typical Weekend peak hour intersection analysis worksheets.

9.2.2 *Daily Street Segment Levels of Service*

Table 9-8 summarizes the Existing + Cumulative projects – Typical Weekday / Weekend segment operations. As seen in *Table 9-8*, with the addition of Cumulative projects traffic the following segments are calculated to operate at LOS E or worse:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS E)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS E)

9.2.3 *Freeway Mainline Segments*

Table 9-9 summarizes the Existing + Cumulative projects – Typical Weekday / Weekend Freeway Mainline segment operations. As seen in *Table 9-9*, with the addition of Cumulative projects traffic the following Freeway Mainline segments are calculated to operate at LOS E or worse:

- **I-5: Lomas Santa Fe Drive and Via De La Valle** – LOS E in the SB direction during the AM peak hour and LOS F(0) in the NB direction during the PM peak hour
- **I-5: Via De La Valle and Del Mar Heights Road** – LOS E in the in the SB direction during the AM peak hour and F(0) in the NB direction during the PM peak hour

9.2.4 *Freeway Metered On-Ramps*

Table 9-5 summarizes the Existing + Cumulative projects – Typical Weekday / Weekend Metered On-Ramp operations using the fixed rate analysis methodology. As shown in *Table 9–5*, no delay is calculated during the AM and PM peak hours using this methodology. This is due to the fact that the ramp meter discharge rate exceeds the peak hour demand. It is widely accepted among the industry that this methodology lacks accuracy in depicting "real world" conditions and often grossly overstates the calculated queues and delays.

9.3 Existing + Cumulative Projects + Project – Typical Weekday / Weekend

9.3.1 *Intersection Analysis*

Table 9-7 summarizes the Existing + Cumulative projects + Project – Typical Weekday / Weekend peak hour intersection operations. As seen in *Table 9-7*, with the addition of Project traffic, with the addition of Project traffic, the following study area intersections are calculated to operate at LOS E or worse during a Typical Weekday:

- **Via De La Valle / S. Cedros Avenue** (SB left-turn LOS E during the PM peak hour)
- **Via De La Valle / Jimmy Durante Boulevard** (LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the PM peak hour)

The increase in delay due to project traffic is less than the allowable 2.0 seconds at the Camino Del Mar / Del Mar Heights Road intersection. Hence, a significant direct impact is not calculated at this intersection. However, significant direct impacts are calculated at the remaining intersections.

On a Weekend, with the addition of Project traffic, the following study area intersections are calculated operate at LOS E or worse:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS F during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS E during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS E during the PM peak hour)

The increase in delay due to project traffic is less than the allowable 2.0 seconds at the Highway 101 / Lomas Santa Fe Drive and the Camino Del Mar / Del Mar Heights Road intersections. Hence, significant direct impacts are not calculated at these intersections. However, significant direct impacts are calculated at the remaining intersections.

Appendix G-1 contains the Existing + Cumulative Projects + Project – Typical Weekday peak hour intersection analysis worksheets and ***Appendix G-2*** contains the Existing + Cumulative Projects + Project – Typical Weekend peak hour intersection analysis worksheets.

9.3.2 *Daily Street Segment Levels of Service*

Table 9-8 summarizes the Existing + Cumulative projects + Project – Typical Weekday segment operations. As seen in *Table 9-8*, with the addition of Project traffic, the following study area segments are calculated to operate at LOS E or worse:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOSE)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS E)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS E)

The increase in V/C ratio due to the project traffic is less than the allowable 0.02 for the segment of Camino Del Mar between Via De La Valle and 27th Street. The increase in V/C on the remaining segments along Via De La Valle is more than the allowable.

The segment of Via De La Valle is calculated currently operate at LOS F on a daily basis. This roadway was visited in the field during peak periods and further analyzed on a peak hour bases and it is noted:

As seen in *Table 9-7*, both signalized intersections along Via De La Valle at Highway 101 and Jimmy Durante Boulevard are calculated to operate at LOS D or better.

The increase in V/C on the segments along Via De La Valle due to Project traffic indicates a potential significant impact. ***Table 9-9*** summarizes the peak hour arterial analysis along Via De La Valle on a Typical Weekday. As seen in *Table 9-9*, the level of service based on the calculated speed along this corridor of Via De La Valle between I-5 and Highway 101 is LOS D or better. Since peak hour intersection operations are more indicative of actual operations than ADT operations, based on the peak hour arterial analysis, no significant direct impact is calculated on Via de la Valle.

9.3.3 *Freeway Mainline Segments*

Table 9-10 summarizes the Existing + Cumulative projects + Project – Typical Weekday Freeway Mainline segment operations. As seen in *Table 9-10*, with the addition of Project traffic, the following Freeway Mainline segments are calculated to operate at LOS E or worse:

- **I-5: Lomas Santa Fe Drive and Via De La Valle** – LOS E in the SB direction during the AM peak hour and LOS F(0) in the NB direction during the PM peak hour
- **I-5: Via De La Valle and Del Mar Heights Road** – LOS E in the in the SB direction during the AM peak hour and F(0) in the NB direction during the PM peak hour

The increase in V/C ratio due to the project traffic is less than the allowable 0.01 for segments operating at LOS E. Hence, no significant direct impacts are calculated.

9.3.4 *Freeway Metered On-Ramps*

Table 9-5 summarizes the Existing + Cumulative projects + Project – Typical Weekday Metered On-Ramp operations using the fixed rate analysis methodology. As shown in *Table 9–5*, no delay is calculated during the AM and PM peak hours using this methodology. This is due to the fact that the ramp meter discharge rate exceeds the peak hour demand. It is widely accepted among the industry that this methodology lacks accuracy in depicting "real world" conditions and often grossly overstates the calculated queues and delays.

TABLE 9–7
NEAR-TERM INTERSECTION OPERATIONS – TYPICAL WEEKDAY / WEEKEND

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Cumulative Projects + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay AM	34.1	C	34.4	C	0.3	None
		WkDay PM	45.5	D	46.0	D	0.5	None
		WkEnd PM	61.6	E	62.1	E	0.5	None
2. Cedros Avenue / Lomas Santa Fe Dr	Signal	WkDay AM	33.5	C	36.1	D	2.6	None
		WkDay PM	22.2	C	22.2	C	0.0	None
		WkEnd PM	21.0	C	21.0	C	0.0	None
3. I-5 SB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	15.4	B	15.5	B	0.1	None
		WkDay PM	32.4	C	32.9	C	0.5	None
		WkEnd PM	13.2	B	13.3	B	0.1	None
4. I-5 NB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	16.4	B	16.4	B	0.0	None
		WkDay PM	14.8	B	14.8	B	0.0	None
		WkEnd PM	13.3	B	13.3	B	0.0	None
5. S. Sierra Ave / Dahlia Dr	AWSC [d]	WkDay AM	8.0	A	8.1	A	0.1	None
		WkDay PM	8.7	A	8.7	A	0.0	None
		WkEnd PM	8.1	A	8.2	A	0.2	None
6. Hwy 101 / Dahlia Dr	Signal	WkDay AM	10.9	B	10.9	B	0.0	None
		WkDay PM	10.5	B	10.6	B	0.1	None
		WkEnd PM	11.5	B	11.5	B	0.0	None

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TABLE 9–7 (CONTINUED)
NEAR-TERM INTERSECTION OPERATIONS – TYPICAL WEEKDAY / WEEKEND

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Cumulative Projects + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
7. Border Ave / S. Sierra Ave	[e]	WkDay AM	[e]	[e]	9.0	A	NA	None
		WkDay PM	[e]	[e]	9.5	A	NA	None
		WkEnd PM	[e]	[e]	9.1	A	NA	None
8. Hwy 101 (Border Ave) / Via De La Valle (Camino Del Mar)	Signal	WkDay AM	14.2	B	14.6	B	0.4	None
		WkDay PM	31.4	C	31.9	C	0.5	None
		WkEnd PM	22.8	C	24.0	C	1.2	None
9. Via De La Valle/ S. Cedros Ave	MSSC [f]	WkDay AM	24.2	C	26.1	D	1.9	None
		WkDay PM	**42.6**	**E**	**48.5**	**E**	**5.9**	**Direct**
		WkEnd PM	24.5	C	26.7	D	2.2	None
10. Via De La Valle/ Jimmy Durante Blvd	Signal	WkDay AM	43.8	D	45.3	D	1.5	None
		WkDay PM	53.9	D	**57.1**	**E**	**3.2**	**Direct**
		WkEnd PM	31.2	C	32.1	C	0.9	None
11. Via De La Valle / I-5 SB Ramps	Signal	WkDay AM	14.4	B	15.0	B	0.6	None
		WkDay PM	14.6	B	15.1	B	0.5	None
		WkEnd PM	12.7	B	13.0	B	0.3	None

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TABLE 9–7 (CONTINUED)
NEAR-TERM INTERSECTION OPERATIONS – TYPICAL WEEKDAY / WEEKEND

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Cumulative Projects + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
12. Via De La Valle / I-5 NB Ramps	Signal	WkDay AM	25.6	C	25.9	C	0.3	None
		WkDay PM	29.3	C	29.9	C	0.6	None
		WkEnd PM	27.0	C	27.5	C	0.5	None
13. Camino Del Mar/ 27th St	AWSC	WkDay AM	18.3	C	18.8	C	0.5	None
		WkDay PM	38.4	**E**	40.2	**E**	1.8	None
		WkEnd PM	**49.6**	**E**	**52.5**	**F**	**2.9**	**Direct**
14. Camino Del Mar/ Coast Blvd	AWSC	WkDay AM	17.0	C	17.4	C	0.4	None
		WkDay PM	**81.5**	**F**	**84.9**	**F**	**3.4**	**Direct**
		WkEnd PM	**43.5**	**E**	**45.9**	**E**	**2.4**	**Direct**
15. Camino Del Mar/ L'Auberge Del Mar	Signal	WkDay AM	6.5	A	6.5	A	0.0	None
		WkDay PM	10.6	B	10.6	B	0.0	None
		WkEnd PM	8.9	A	8.9	A	0.0	None
16. Camino Del Mar/ 15th St	Signal	WkDay AM	22.0	C	22.0	C	0.0	None
		WkDay PM	32.5	C	33.0	C	0.5	None
		WkEnd PM	33.7	C	35.0	D	1.3	None

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TABLE 9–7 (CONTINUED)
EXISTING + PROJECT INTERSECTION OPERATIONS – TYPICAL WEEKDAY / WEEKEND

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Cumulative Projects + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
17. Camino Del Mar/ Del Mar Heights Rd	MSSC	WkDay AM	33.7	C	33.9	C	0.2	None
		WkDay PM	89.3	F	90.1	F	0.8	None
		WkEnd PM	145.6	F	146.2	F	0.6	None
18. Camino Del Mar/ Carmel Valley Rd	Signal	WkDay AM	22.7	C	23.2	C	0.5	None
		WkDay PM	23.1	C	23.6	C	0.5	None
		WkEnd PM	12.2	B	12.3	B	0.1	None
19. Via de la Valle / Solana Circ	MSSC	WkDay AM	20.1	C	21.1	C	1.0	None
		WkDay PM	20.1	C	21.3	C	1.2	None
		WkEnd PM	16.3	C	17.2	C	0.9	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to the Project.
d. AWSC – All-Way Stop Controlled intersection. Minor street left turn delay is reported.
e. Turn in the road. No traffic control exists.
f. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay is reported.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

General Notes:

WkDay AM – Weekday AM
WkDay PM – Weekday PM
WkEnd PM – Weekend Peak

TABLE 9–8
NEAR-TERM STREET SEGMENT OPERATIONS – TYPICAL WEEKDAY

Street Segment	Functional Classification [a]	Capacity (LOS E)	Existing + Cumulative Projects			Existing + Cumulative Projects + Project			Δ V/C [d]	Impact Type
			ADT	LOS [b]	V/C [c]	ADT	LOS	V/C		
S. Sierra Avenue										
Del Mar Shore Ter to Beach Club Dr	Minor Collector	8,000	3,580	B	0.448	3,640	B	0.455	0.008	None
Highway 101										
Lomas Santa Fe Dr to Dahlia Dr	4-ln Major Arterial	37,000	15,470	B	0.418	15,670	B	0.424	0.006	None
Dahlia Dr to Via De La Valle	4-ln Major Arterial	37,000	18,600	B	0.503	18,800	B	0.508	0.005	None
Camino Del Mar										
Via De La Valle to 27th St	Comm Collector	19,000	16,550	E	0.871	16,700	E	0.879	0.008	None
27th St to Coast Blvd	Comm Collector	19,000	12,150	C	0.639	12,300	C	0.647	0.008	None
Coast Blvd to Jimmy Durante Blvd	Comm Collector	19,000	9,730	A	0.512	9,860	A	0.519	0.007	None
Via De La Valle										
Hwy 101 to S. Cedros Ave	Town Collector	19,000	17,300	E	0.911	18,300	E	0.963	0.052	None [e]
S. Cedros Ave to Jimmy Durante Blvd	Town Collector	19,000	19,950	F	1.050	20,920	F	1.101	0.051	None [e]
Jimmy Durante Blvd to I-5 SB Ramps	4-ln Major Arterial [f]	50,000	48,090	E	0.962	49,010	E	0.980	0.018	None [e]

Footnotes:

a. The San Diego County capacity at which the roadway currently functions.
b. Level of Service.
c. The Volume / Capacity ratio.
d. Increase in V/C ratio due to the addition of project traffic.
e. Not an impact. See text for explanation.
f. A third eastbound through lane is provided along this segment, which merges into the I-5 SB on-ramp. Hence the capacity of an additional lane is assumed.

TABLE 9–9
VIA DE LA VALLE NEAR-TERM PEAK HOUR ARTERIAL ANALYSIS – TYPICAL WEEKDAY

Direction	Existing + Cumulative Projects						Existing + Cumulative Projects + Project					
	AM			PM			AM			PM		
	Time [a]	Speed [b]	LOS	Time	Speed	LOS	Time	Speed	LOS	Time	Speed	LOS
Eastbound	120.7	25.1	C	122.6	24.7	C	121.1	25.0	C	124.4	24.3	C
Westbound	122.4	24.7	C	148.1	20.4	D	123.6	24.5	C	158.2	19.1	D

Footnotes:

a. Time in seconds
b. Speed in miles per hour.

TABLE 9–10
NEAR-TERM FREEWAY MAINLINE SEGMENT OPERATIONS – TYPICAL WEEKDAY

Freeway Segment	Dir.	# of Lanes	AADT	Hourly Cap	Cumulative Projects Volume		Existing + Cumulative Projects [a]						Project Volume		Existing + Cumulative Projects + Project							
							Volume		V/C [b]		LOS				Volume		V/C		LOS		Δ V/C	
					AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Interstate 5																						
Lomas Santa Fe Dr to Via De La Valle	NB	4ML + 1HOV + 1Aux	211,080	9,200	29	55	7,363	9,641	0.800	1.048	D	F(0)	10	12	7,373	9,653	0.801	1.049	D	F(0)	0.001	0.001
	SB	5ML + 1Aux		10,000	119	133	9,281	8,052	0.928	0.805	E	D	10	13	9,291	8,065	0.929	0.807	E	D	0.001	0.001
Via De La Valle to Del Mar Heights Rd	NB	4ML + 1HOV + 1Aux	224,760	9,200	230	302	7,758	10,141	0.843	1.102	D	F(0)	20	25	7,778	10,166	0.845	1.105	D	F(0)	0.002	0.003
	SB	5ML + 1HOV		10,000	102	135	9,506	8,264	0.951	0.826	E	D	19	24	9,525	8,288	0.952	0.829	E	D	0.002	0.002
Del Mar Heights Rd to SR 56	NB	6ML + 1Aux+1HOV	191,260	12,800	230	302	6,555	8,569	0.512	0.669	B	C	20	25	6,575	8,594	0.514	0.671	B	C	0.002	0.002
	SB	5ML + 1Aux+1HOV		11,000	102	135	8,003	6,964	0.728	0.633	C	C	19	24	8,022	6,988	0.729	0.635	C	C	0.002	0.002

Footnotes:

a. Existing + Cumulative Projects Volumes

b. V/C = (Peak Hour volume/Capacity)

LOS	v/c
A	<0.41
B	0.62
C	0.80
D	0.92
E	1.00
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

10.0 ANALYSIS OF NEAR-TERM SCENARIOS – DURING FAIR

10.1 Existing + Project – During Fair

10.1.1 *Intersection Analysis*

Table 10-1 summarizes the Existing + Project – During Fair peak hour intersection operations on a weekday. As seen in *Table 10-1*, with the addition of Project traffic, the following study area intersections are calculated to operate at LOS E or worse:

- **Via De La Valle / Jimmy Durante Boulevard** (LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS F during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)

Significant direct impacts are calculated at all of the above intersections.

On a Weekend, with the addition of Project traffic, the following study area intersections are calculated to operate at LOS E or worse:

- **Via De La Valle / Jimmy Durante Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard (LOS F during the PM peak hour)**

Significant direct impacts are calculated at all of the above intersections.

The Existing + Project – During Fair peak hour intersection analysis worksheets are included in ***Appendix H***.

10.1.2 *Daily Street Segment Levels of Service*

Table 10-2 summarizes the Existing + Project – During Fair segment operations. As seen in *Table 10-2*, with the addition of Project traffic, the following study area segments are calculated to continue to operate at LOS D or better except the following:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Camino Del Mar:** 27th Street to Coast Boulevard (LOS E)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS E)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS F)

The increase in daily V/C ratio due to the project traffic is less than the allowable 0.02 for the segments of Camino Del Mar between Via De La Valle and Coast Boulevard.

The increase in V/C on the segments along Via De La Valle indicates a potential significant impact.

TABLE 10–1
EXISTING + PROJECT INTERSECTION OPERATIONS – TYPICAL WEEKDAY DURING FAIR

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay AM	31.7	C	31.8	C	0.1	None
		WkDay PM	48.6	D	49.0	D	0.4	None
		WkEnd PM	40.5	D	44.2	D	3.7	None
2. Cedros Avenue / Lomas Santa Fe Dr	Signal	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A
3. I-5 SB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A
4. I-5 NB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A
5. S. Sierra Ave / Dahlia Dr	AWSC [d]	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A
6. Hwy 101 / Dahlia Dr	Signal	WkDay AM	6.9	A	6.9	A	0.0	None
		WkDay PM	8.2	A	8.2	A	0.0	None
		WkEnd PM	6.5	A	6.5	A	0.0	None

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TABLE 10–1 (CONTINUED)
EXISTING + PROJECT INTERSECTION OPERATIONS – DURING FAIR

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
7. Border Ave / S. Sierra Ave	[e]	WkDay AM	[e]	[e]	12.5	B	N/A	N/A
		WkDay PM	[e]	[e]	14.0	B	N/A	N/A
		WkEnd PM	[e]	[e]	9.0	A	N/A	N/A
8. Hwy 101 (Border Ave) / Via De La Valle (Camino Del Mar)	MSSC [f]	WkDay AM	14.9	B	15.8	B	0.9	None
		WkDay PM	24.0	C	24.2	C	0.2	None
		WkEnd PM	21.4	C	22.0	C	0.6	None
9. Via De La Valle/ S. Cedros Ave	Signal	WkDay AM	22.7	C	24.3	C	1.6	None
		WkDay PM	23.0	C	25.0	C	2.0	None
		WkEnd PM	17.7	C	19.1	C	1.4	None
10. Via De La Valle/ Jimmy Durante Blvd	Signal	WkDay AM	37.3	D	38.1	D	0.8	None
		WkDay PM	**64.9**	**E**	**67.2**	**E**	**2.3**	**Direct**
		WkEnd PM	52.1	D	**89.7**	**F**	**37.6**	**Direct**
11. Via De La Valle / I-5 SB Ramps	Signal	WkDay AM	10.3	B	10.5	B	0.2	None
		WkDay PM	12.4	B	12.9	B	0.5	None
		WkEnd PM	17.7	B	18.8	B	1.1	None
12. Via De La Valle / I-5 NB Ramps	AWSC [f]	WkDay AM	24.0	C	24.2	C	0.2	None
		WkDay PM	29.9	C	30.3	C	0.4	None
		WkEnd PM	29.4	C	29.7	C	0.3	None

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TABLE 10–1 (CONTINUED)
EXISTING + PROJECT INTERSECTION OPERATIONS – DURING FAIR

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
13. Camino Del Mar/ 27th St	AWSC	WkDay AM	17.3	C	17.7	C	0.4	None
		WkDay PM	**68.4**	**F**	**71.6**	**F**	**3.2**	**Direct**
		WkEnd PM	**45.7**	**E**	**48.4**	**E**	**2.7**	**Direct**
14. Camino Del Mar/ Coast Blvd	Signal	WkDay AM	17.6	C	17.9	C	0.3	None
		WkDay PM	**93.4**	**F**	**97.4**	**F**	**4.0**	**Direct**
		WkEnd PM	**39.0**	**E**	**41.6**	**E**	**2.6**	**Direct**
15. Camino Del Mar/ L'Auberge Del Mar	Signal	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A
16. Camino Del Mar/ 15th St	MSSC	WkDay AM	21.7	C	21.7	C	0.0	None
		WkDay PM	31.0	C	31.1	C	0.1	None
		WkEnd PM	30.9	C	32.3	C	1.4	None
17. Camino Del Mar/ Del Mar Heights Rd	Signal	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A
18. Camino Del Mar/ Carmel Valley Rd	Signal	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A

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TABLE 10–1 (CONTINUED)
EXISTING + PROJECT INTERSECTION OPERATIONS – DURING FAIR

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
19. Via de la Valle / Solana Circ	Signal	WkDay AM	17.2	C	17.2	C	0.0	None
		WkDay PM	14.5	B	14.6	B	0.1	None
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to the Project.
d. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay is reported.
e. Turn in the road. No traffic control exists.
f. AWSC – All-Way Stop Controlled intersection. Minor street left turn delay is reported.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

General Notes:

WkDay AM – Weekday AM
WkDay PM – Weekday PM
DNA – Did not Analyze
N/A – Not Applicable

TABLE 10–2
EXISTING + PROJECT STREET SEGMENT OPERATIONS – DURING FAIR (WEEKDAY)

Street Segment	Functional Classification [a]	Capacity (LOS E)	Existing			Existing + Project			Δ V/C [e]	Impact Type
			ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C		
S. Sierra Avenue										
Del Mar Shore Ter to Beach Club Dr	Minor Collector	8,000	3,500	B	0.438	3,560	B	0.445	0.007	None
Highway 101										
Lomas Santa Fe Dr to Dahlia Dr	4-ln Major Arterial	37,000	18,700	B	0.505	18,900	B	0.511	0.006	None
Dahlia Dr to Via De La Valle	4-ln Major Arterial	37,000	19,000	B	0.514	19,200	B	0.519	0.005	None
Camino Del Mar										
Via De La Valle to 27th St	Comm Collector	19,000	17,700	E	0.932	17,850	E	0.939	0.007	None
27th St to Coast Blvd	Comm Collector	19,000	16,800	E	0.884	16,950	E	0.892	0.008	None
Coast Blvd to Jimmy Durante Blvd	Comm Collector	19,000	11,300	B	0.595	11,430	B	0.602	0.007	None
Via De La Valle										
Hwy 101 to S. Cedros Ave	Town Collector	19,000	**15,600**	**E**	**0.821**	**16,600**	**E**	**0.874**	**0.053**	**Direct**
S. Cedros Ave to Jimmy Durante Blvd	Town Collector	19,000	**24,300**	**F**	**1.279**	**25,270**	**F**	**1.330**	**0.051**	**Direct**
Jimmy Durante Blvd to I-5 SB Ramps	4-ln Major Arterial [f]	50,000	**58,200**	**F**	**1.164**	**59,120**	**F**	**1.182**	**0.018**	**Direct**

Footnotes:

a. The San Diego County capacity at which the roadway currently functions.
b. Existing daily segment volumes from *Table 3-2*.
c. Level of Service.
d. The Volume / Capacity ratio.
e. Increase in V/C ratio due to the addition of project traffic.
f. A third eastbound through lane is provided along this segment, which merges into the I-5 SB on-ramp. Hence the capacity of an additional lane is assumed.

10.2 Existing + Cumulative Projects During Fair

10.2.1 *Intersection Analysis*

Table 10-3 summarizes the Existing + Cumulative projects During Fair peak hour intersection operations. As seen in *Table 10-3*, with the addition of Cumulative projects traffic the following study area intersections are calculated to continue to operate at LOS D or better except the following:

- **Via De La Valle / Jimmy Durante Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS F during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)

On a Weekend, the following study area intersections are calculated to operate at LOS E or worse:

- **Via De La Valle / Jimmy Durante Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS F during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)

Significant direct impacts are calculated at all of the above intersections.

The Existing + Cumulative projects During Fair peak hour intersection analysis worksheets are included in ***Appendix I***.

10.2.2 *Daily Street Segment Levels of Service*

Table 10-4 summarizes the Existing + Cumulative projects During Fair segment operations. As seen in *Table 10-4*, with the addition of Cumulative projects traffic the following study area segments are calculated to currently operate at LOS D or better except the following:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Camino Del Mar:** 27th Street to Coast Boulevard (LOS E)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS E)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS F)

10.3 Existing (During Fair) + Cumulative Projects + Project

10.3.1 *Intersection Analysis*

Table 10-3 summarizes the Existing + Cumulative projects + Project During Fair peak hour intersection operations. As seen in *Table 10-3*, with the addition of Project traffic, the following study area intersections are calculated to currently operate at LOS D or better except the following:

- **Via De La Valle / Jimmy Durante Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS F during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)

Significant direct impacts are calculated at all of the above intersections.

On a Weekend, with the addition of Project traffic, the following study area intersections are calculated to operate at LOS E or worse:

- **Via De La Valle / Jimmy Durante Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS F during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)

Significant direct impacts are calculated at all of the above intersections.

The Existing + Cumulative projects + Project During Fair peak hour intersection analysis worksheets are included in ***Appendix J***.

10.3.2 *Daily Street Segment Levels of Service*

Table 10-4 summarizes the Existing + Cumulative projects + Project During Fair segment operations. As seen in *Table 10-4*, with the addition of Project traffic, the following study area segments are calculated to currently operate at LOS D or better except the following:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS F)
- **Camino Del Mar:** 27th Street to Coast Boulevard (LOS E)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS E)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS F)

The increase in V/C ratio due to the project traffic is less than the allowable 0.02 for the segments of Camino Del Mar between Via De La Valle and Coast Boulevard.

The increase in V/C on the segments along Via De La Valle indicates a significant impact.

TABLE 10–3
NEAR-TERM INTERSECTION OPERATIONS DURING FAIR

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Cumulative Projects + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay AM	32.2	C	32.3	C	0.1	None
		WkDay PM	52.3	D	52.9	D	0.6	None
		WkEnd PM	49.5	D	49.9	D	0.4	
2. Cedros Avenue / Lomas Santa Fe Dr	Signal	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A
3. I-5 SB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A
4. I-5 NB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A
5. S. Sierra Ave / Dahlia Dr	MSSC [d]	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A
6. Hwy 101 / Dahlia Dr	Signal	WkDay AM	10.1	B	10.1	B	0.0	None
		WkDay PM	14.6	B	14.7	B	0.1	None
		WkEnd PM	12.6	B	12.6	B	0.0	None

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TABLE 10–3 (CONTINUED)
NEAR-TERM INTERSECTION OPERATIONS DURING FAIR

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Cumulative Projects + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
7. Border Ave / S. Sierra Ave	[e]	WkDay AM	[e]	[e]	12.5	B	NA	N/A
		WkDay PM	[e]	[e]	14.0	B	NA	N/A
		WkEnd PM	[e]	[e]	9.0	A	NA	N/A
8. Hwy 101 (Border Ave) / Via De La Valle (Camino Del Mar)	Signal	WkDay AM	15.8	B	16.7	B	0.9	None
		WkDay PM	24.4	C	24.6	C	0.2	None
		WkEnd PM	21.7	C	22.3	C	0.6	None
9. Via De La Valle/ S. Cedros Ave	MSSC	WkDay AM	25.4	D	27.2	D	1.8	None
		WkDay PM	27.5	D	30.1	D	2.6	None
		WkEnd PM	20.1	C	21.8	C	1.7	None
10. Via De La Valle/ Jimmy Durante Blvd	Signal	WkDay AM	43.9	D	45.1	D	1.2	None
		WkDay PM	**84.4**	**F**	**87.4**	**F**	**3.0**	**Direct**
		WkEnd PM	110.3	F	112.0	F	1.7	None
11. Via De La Valle / I-5 SB Ramps	Signal	WkDay AM	13	B	13.4	B	0.4	None
		WkDay PM	17	B	17.8	B	0.8	None
		WkEnd PM	27	C	28.8	C	1.8	None
12. Via De La Valle / I-5 NB Ramps	Signal	WkDay AM	25.2	C	25.4	C	0.2	None
		WkDay PM	31.8	C	32.2	C	0.4	None
		WkEnd PM	29.5	C	29.9	C	0.4	None

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TABLE 10–3 (CONTINUED)
NEAR-TERM INTERSECTION OPERATIONS DURING FAIR

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Cumulative Projects + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
13. Camino Del Mar/ 27th St	AWSC [f]	WkDay AM	19.9	C	20.3	C	0.4	None
		WkDay PM	**89.7**	**F**	**93.4**	**F**	**3.7**	**Direct**
		WkEnd PM	**64.6**	**F**	**68.0**	**F**	**3.4**	**Direct**
14. Camino Del Mar/ Coast Blvd	AWSC	WkDay AM	19.9	C	20.5	C	0.6	None
		WkDay PM	**115.6**	**F**	**119.7**	**F**	**4.1**	**Direct**
		WkEnd PM	**53**	**F**	**56.3**	**F**	**3.3**	**Direct**
15. Camino Del Mar/ L'Auberge Del Mar	Signal	WkDay AM	DNA	DNA	DNA	DNA	DNA	N/A
		WkDay PM	DNA	DNA	DNA	DNA	DNA	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	N/A
16. Camino Del Mar/ 15th St	Signal	WkDay AM	21.9	C	21.9	C	0.0	None
		WkDay PM	31.4	C	31.4	C	0.0	None
		WkEnd PM	32.3	C	32.3	C	0.0	None
17. Camino Del Mar/ Del Mar Heights Rd	MSSC	WkDay AM	DNA	DNA	DNA	DNA	N/A	N/A
		WkDay PM	DNA	DNA	DNA	DNA	N/A	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	N/A	N/A

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TABLE 10–3 (CONTINUED)
NEAR-TERM INTERSECTION OPERATIONS DURING FAIR

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Cumulative Projects + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
18. Camino Del Mar/ Carmel Valley Rd	Signal	WkDay AM	DNA	DNA	DNA	DNA	N/A	N/A
		WkDay PM	DNA	DNA	DNA	DNA	N/A	N/A
		WkEnd PM	DNA	DNA	DNA	DNA	N/A	N/A
19. Via de la Valle / Solana Circ	Signal	WkDay AM	18.2	C	18.2	C	0.0	None
		WkDay PM	15.4	C	15.5	C	0.1	None
		WkEnd PM	DNA	DNA	DNA	DNA	DNA	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to the Project.
d. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay is reported.
e. Turn in the road. No traffic control exists.
f. AWSC – All-Way Stop Controlled intersection. Minor street left turn delay is reported.

General Notes:

WkDay AM – Weekday AM
WkDay PM – Weekday PM
DNA – Did Not Analyze
N/A – Not Applicable

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 10–4
NEAR-TERM STREET SEGMENT OPERATIONS – DURING FAIR (WEEKDAY)

Street Segment	Functional Classification [a]	Capacity (LOS E)	Existing + Cumulative Projects			Existing + Cumulative Projects + Project			Δ V/C [d]	Impact Type
			ADT	LOS [b]	V/C [c]	ADT	LOS	V/C		
S. Sierra Avenue										
Del Mar Shore Ter to Beach Club Dr	Minor Collector	8,000	3,680	B	0.460	3,740	B	0.468	0.008	None
Highway 101										
Lomas Santa Fe Dr to Dahlia Dr	4-ln Major Arterial	37,000	19,170	B	0.518	19,370	B	0.524	0.006	None
Dahlia Dr to Via De La Valle	4-ln Major Arterial	37,000	19,700	B	0.532	19,900	B	0.538	0.006	None
Camino Del Mar										
Via De La Valle to 27th St	Comm Collector	19,000	18,950	E	0.997	19,100	F	1.005	0.008	None
27th St to Coast Blvd	Comm Collector	19,000	18,050	E	0.950	18,200	E	0.958	0.008	None
Coast Blvd to Jimmy Durante Blvd	Comm Collector	19,000	12,130	C	0.638	12,260	C	0.645	0.007	None
Via De La Valle										
Hwy 101 to S. Cedros Ave	Town Collector	19,000	**16,400**	**E**	**0.863**	**17,400**	**E**	**0.916**	**0.053**	**Direct**
S. Cedros Ave to Jimmy Durante Blvd	Town Collector	19,000	**25,450**	**F**	**1.339**	**26,420**	**F**	**1.391**	**0.051**	**Direct**
Jimmy Durante Blvd to I-5 SB Ramps	4-ln Major Arterial [e]	50,000	**62,090**	**F**	**1.242**	**63,010**	**F**	**1.260**	**0.018**	**Direct**

Footnotes:

a. The San Diego County capacity at which the roadway currently functions.
b. Level of Service.
c. The Volume / Capacity ratio.
d. Increase in V/C ratio due to the addition of project traffic.
e. A third eastbound through lane is provided along this segment, which merges into the I-5 SB on-ramp. Hence the capacity of an additional lane is assumed.

11.0 ANALYSIS OF NEAR-TERM SCENARIOS – DURING RACES

11.1 Existing + Project During Horse Races

11.1.1 *Intersection Analysis*

Table 11-1 summarizes the Existing + Project During Horse Races Weekday and Weekend peak hour intersection operations. As seen in *Table 11-1*, with the addition of Project traffic, the following study area intersections are calculated to operate at LOS E or worse for the Weekday PM peak hour:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Via De La Valle / S. Cedros Avenue** (SB left-turn LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS F during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the PM peak hour)

The increase in delay due to project traffic is less than the allowable 2.0 seconds at the Highway 101 / Lomas Santa Fe Drive and the Camino Del Mar / Del Mar Heights Road intersections. Hence, significant direct impacts are not calculated at these intersections. However, significant direct impacts are calculated at the remaining intersections.

The Existing + Project on a weekday During Horse Races peak hour intersection analysis worksheets are included in ***Appendix K-1***.

On a Weekend, with the addition of Project traffic, the following study area intersections are calculated to operate at LOS E or worse:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the PM peak hour)

The increase in delay due to project traffic is less than the allowable 2.0 seconds at the Highway 101 / Lomas Santa Fe Drive and the Camino Del Mar / Del Mar Heights Road intersections. Hence, significant direct impacts are not calculated at these intersections. However, significant a significant direct impact is calculated at the remaining intersection.

The Existing + Project on a weekend During Horse Races peak hour intersection analysis worksheets are included in ***Appendix K-2***.

11.1.2 *Daily Street Segment Levels of Service*

Table 11-2 summarizes the Existing + Project During Horse Races segment operations. As seen in *Table 11-2*, with the addition of Project traffic, the following study area segments are calculated to continue to operate at LOS D or better except the following:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Camino Del Mar:** 27th Street to Coast Boulevard (LOS E)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS F)

- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS E)

The increase in V/C ratio due to the project traffic is less than the allowable 0.02 for the segments of Camino Del Mar between Via De La Valle and Coast Boulevard.

VIA DE LA VALLE

The segment of Via De La Valle is calculated currently operate at LOS F on a daily basis During Horse Races on a weekday. As seen in *Table 9-7*, both signalized intersections along Via De La Valle at Highway 101 and Jimmy Durante Boulevard are calculated to operate at LOS D or better During Horse Races.

The increase in V/C on the segments along Via De La Valle due to Project traffic indicates a potential significant impact. ***Table 11-3*** summarizes the peak hour arterial analysis along Via De La Valle During Horse Races on a weekday. As seen in *Table 11-3*, the level of service based on the calculated speed along this corridor of Via De La Valle between I-5 and Highway 101 is LOS D or better. Since peak hour intersection operations are more indicative of actual operations than ADT operations, based on the peak hour arterial analysis, no significant direct impact is calculated on Via de la Valle.

Appendix G-4 contains the Existing + Project Arterial Analysis Worksheets during the Horse Races on a weekday.

TABLE 11–1
EXISTING + PROJECT INTERSECTION OPERATIONS – DURING HORSE RACES

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay PM	61.0	E	61.5	E	0.5	None
		WkEnd PM	68.1	E	68.7	E	0.6	None
2. Cedros Avenue / Lomas Santa Fe Dr	Signal	WkDay PM	20.7	C	20.7	C	0.0	None
		WkEnd PM	21.7	C	21.7	C	0.0	None
3. I-5 SB Ramps / Lomas Santa Fe Dr	Signal	WkDay PM	20.6	C	21.3	C	0.7	None
		WkEnd PM	14.7	B	14.8	B	0.1	None
4. I-5 NB Ramps / Lomas Santa Fe Dr	Signal	WkDay PM	14.3	B	14.3	B	0.0	None
		WkEnd PM	12.5	B	12.5	B	0.0	None
5. S. Sierra Ave / Dahlia Dr	AWSC [d]	WkDay PM	8.1	A	8.1	A	0.0	None
		WkEnd PM	13.6	B	13.9	B	0.3	None
6. Hwy 101 / Dahlia Dr	Signal	WkDay PM	5.8	A	7.5	A	1.7	None
		WkEnd PM	6.5	A	6.5	A	0.0	None
7. Border Ave / S. Sierra Ave	[e]	WkDay PM	[e]	[e]	13.0	B	N/A	N/A
		WkEnd PM	[e]	[e]	12.2	B	N/A	N/A
8. Hwy 101 (Border Ave) / Via De La Valle (Camino Del Mar)	Signal	WkDay PM	24.4	C	24.9	C	0.5	None
		WkEnd PM	23.6	C	26.2	C	2.6	None

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TABLE 11–1 (CONTINUED)
EXISTING + PROJECT INTERSECTION OPERATIONS – DURING HORSE RACES

Intersection	Control Type	Peak Hour	Existing [a]		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
9. Via De La Valle/ S. Cedros Ave	MSSC [f]	WkDay PM	31.3	D	**35.6**	**E**	**4.3**	**Direct**
		WkEnd PM	18.1	C	19.5	C	1.4	None
10. Via De La Valle/ Jimmy Durante Blvd	Signal	WkDay PM	35.6	D	40.6	D	5.0	None
		WkEnd PM	30.6	C	31.0	C	0.4	None
11. Via De La Valle / I-5 SB Ramps	Signal	WkDay PM	9.1	A	10.1	B	1.0	None
		WkEnd PM	8.7	A	8.9	A	0.2	None
12. Via De La Valle / I-5 NB Ramps	Signal	WkDay PM	25.8	C	26.3	C	0.5	None
		WkEnd PM	24.8	C	25.3	C	0.5	None
13. Camino Del Mar/ 27th St	AWSC	WkDay PM	**35.1**	**E**	**139.3**	**F**	**4.2**	**Direct**
		WkEnd PM	29.4	D	30.9	D	1.5	None
14. Camino Del Mar/ Coast Blvd	AWSC	WkDay PM	**257.9**	**F**	**262.4**	**F**	**4.5**	**Direct**
		WkEnd PM	**88.6**	**F**	**92.9**	**F**	**4.3**	**Direct**
15. Camino Del Mar/ L'Auberge Del Mar	Signal	WkDay PM	9.2	A	9.5	A	0.3	None
		WkEnd PM	9.6	A	9.6	A	0.0	None
16. Camino Del Mar/ 15th St	Signal	WkDay PM	31.6	C	31.9	C	0.3	None
		WkEnd PM	33.4	C	33.6	C	0.2	None

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TABLE 11–1 (CONTINUED)
EXISTING + PROJECT INTERSECTION OPERATIONS – DURING HORSE RACES

Intersection	Control Type	Peak Hour	Existing [a]		Existing + Project		Δ Delay [d]	Impact Type
			Delay [b]	LOS [c]	Delay	LOS		
17. Camino Del Mar/ Del Mar Heights Rd	MSSC	WkDay PM	164.4	F	164.9	F	0.5	None
		WkEnd PM	113.9	F	114.9	F	1.0	None
18. Camino Del Mar/ Carmel Valley Rd	Signal	WkDay PM	28.2	C	28.7	C	0.5	None
		WkEnd PM	13.8	B	13.9	B	0.1	None
19. Via de la Valle/ Solana Circle	Signal	WkDay PM	22.4	C	23.9	C	1.5	None
		WkEnd PM	16.5	C	17.6	C	1.1	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to the Project.
d. AWSC – All-Way Stop Controlled intersection. Minor street left turn delay is reported.
e. Turn in the road. No traffic control exists.
f. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay is reported.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

General Notes:

WkDay AM – Weekday AM
WkDay PM – Weekday PM
N/A – Not Applicable

TABLE 11–2
EXISTING + PROJECT STREET SEGMENT OPERATIONS – DURING HORSE RACES (WEEKDAY)

Street Segment	Functional Classification [a]	Capacity (LOS E)	Existing [b]			Existing + Project			Δ V/C [e]	Impact Type
			ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C		
S. Sierra Avenue										
Del Mar Shore Ter to Beach Club Dr	Minor Collector	8,000	4,300	C	0.538	4,360	C	0.545	0.007	None
Highway 101										
Lomas Santa Fe Dr to Dahlia Dr	4-ln Major Arterial	37,000	19,400	B	0.524	19,600	B	0.530	0.006	None
Dahlia Dr to Via De La Valle	4-ln Major Arterial	37,000	20,400	B	0.551	20,600	B	0.557	0.006	None
Camino Del Mar										
Via De La Valle to 27th St	Comm Collector	19,000	16,900	E	0.889	17,050	E	0.897	0.008	None
27th St to Coast Blvd	Comm Collector	19,000	18,500	E	0.974	18,650	E	0.982	0.008	None
Coast Blvd to Jimmy Durante Blvd	Comm Collector	19,000	12,800	C	0.674	12,930	C	0.681	0.007	None
Via De La Valle										
Hwy 101 to S. Cedros Ave	Town Collector	19,000	18,500	E	0.974	19,500	F	1.026	0.052	None [f]
S. Cedros Ave to Jimmy Durante Blvd	Town Collector	19,000	23,700	F	1.247	24,670	F	1.298	0.051	None [f]
Jimmy Durante Blvd to I-5 SB Ramps	4-ln Major Arterial [g]	50,000	45,200	F	0.904	46,120	E	0.922	0.018	None [f]

Footnotes:

a. The San Diego County capacity at which the roadway currently functions.
b. Existing daily segment volumes from *Table 3-2*.
c. Level of Service.
d. The Volume / Capacity ratio.
e. Increase in V/C ratio due to the addition of project traffic.
f. Not an impact. See text for explanation.
g. A third eastbound through lane is provided along this segment, which merges into the I-5 SB on-ramp. Hence the capacity of an additional lane is assumed.

TABLE 11-3
VIA DE LA VALLE EXISTING + PROJECT PEAK HOUR ARTERIAL ANALYSIS – DURING HORSE RACES WEEKDAY

Direction	Existing						Existing + Project					
	Weekday PM			Weekend PM			Weekday PM			Weekend PM		
	Time [a]	Speed [b]	LOS	Time	Speed	LOS	Time	Speed	LOS	Time	Speed	LOS
Eastbound	119.2	25.4	C	123.6	24.5	C	123	24.6	C	128.1	23.6	C
Westbound	133.6	22.6	C	119.4	25.3	C	149.8	20.2	D	122.5	24.7	C

Footnotes:

a. Time in Seconds
b. Speed in miles per hour.

11.2 Existing + Cumulative Projects – During Horse Races

11.2.1 *Intersection Analysis*

Table 11–4 summarizes the Existing + Cumulative projects (During Horse Races) peak hour intersection operations. As seen in *Table 11–4*, with the addition of Cumulative projects traffic the following study area intersections are calculated to continue to operate at LOS E or worse during the Weekday PM peak hour:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Via De La Valle / S. Cedros Avenue** (SB left-turn LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS F during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the PM peak hour)

The Existing + Cumulative Projects on a weekday During Horse Races peak hour intersection analysis worksheets are included in ***Appendix L-1***.

On a Weekend, with the addition of Cumulative projects traffic, the following study area intersections are calculated to operate at LOS E or worse:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the PM peak hour)

The Existing + Cumulative Projects on a weekend During Horse Races peak hour intersection analysis worksheets are included in ***Appendix L-2***.

11.2.2 *Daily Street Segment Levels of Service*

Table 11–5 summarizes the Existing + Cumulative projects (During Horse Races) segment operations. As seen in *Table 11–5*, with the addition of Cumulative projects traffic the following study area segments are calculated to continue to operate at LOS E or worse:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Camino Del Mar:** 27th Street to Coast Boulevard (LOS F)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS F)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS E)

11.3 Existing (During Horse Races) + Cumulative Projects + Project

11.3.1 *Intersection Analysis*

Table 11–4 summarizes the Existing + Cumulative projects + Project (During Horse Races) peak hour intersection operations. As seen in *Table 11–4*, with the addition of Project traffic, the following study area intersections are calculated to continue to operate at LOS E or worse during the Weekday PM peak hour:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Via De La Valle / S. Cedros Avenue** (SB left-turn LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS F during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the PM peak hour)

The increase in delay due to project traffic is less than the allowable 2.0 seconds at the Highway 101 / Lomas Santa Fe Drive and the Camino Del Mar / Del Mar Heights Road intersections. Hence, significant direct impacts are not calculated at these intersections. However, significant direct impacts are calculated at the remaining intersections.

The Existing + Cumulative Projects + Project on a weekday During Horse Races peak hour intersection analysis worksheets are included in ***Appendix M-1***.

On a Weekend, with the addition of Project traffic, the following study area intersections are calculated operate at LOS E or worse:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS F during the PM peak hour)

The increase in delay due to project traffic is less than the allowable 2.0 seconds at the Highway 101 / Lomas Santa Fe Drive and the Camino Del Mar / Del Mar Heights Road intersections. Hence, significant direct impacts are not calculated at these intersections. However, significant a significant direct impact is calculated at the remaining intersections.

The Existing + Cumulative Projects + Project on a weekday During Horse Races peak hour intersection analysis worksheets are included in ***Appendix M-2***.

11.3.2 *Daily Street Segment Levels of Service*

Table 11-4 summarizes the Existing + Cumulative projects + Project (During Horse Races) segment operations. As seen in *Table 11-4*, with the addition of Project traffic, the following study area segments are calculated to continue to operate at LOS E or worse:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Camino Del Mar:** 27th Street to Coast Boulevard (LOS F)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS F)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS F)

VIA DE LA VALLE

The segment of Via De La Valle is calculated to operate at LOS F with the additional of Cumulative projects and Project traffic on a daily basis During Horse Races. As seen in *Table 11-4*, both signalized intersections along Via De La Valle at Highway 101 and Jimmy Durante Boulevard are calculated to operate at LOS D or better During Horse Races.

The increase in V/C on the segments along Via De La Valle due to Project traffic indicates a potential significant impact. ***Table 11-6*** summarizes the peak hour arterial analysis along Via De La Valle During Horse Races on a weekday. As seen in *Table 11-6*, the level of service based on the calculated speed along this corridor of Via De La Valle between I-5 and Highway 101 is LOS D or better. Since peak hour intersection operations are more indicative of actual operations than ADT operations, based on the peak hour arterial analysis, no significant direct impact is calculated on Via de la Valle.

TABLE 11–4
EXISTING + PROJECT + CUMULATIVE PROJECTS INTERSECTION OPERATIONS – DURING HORSE RACES

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Project + Cumulative Projects		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay PM	68.1	E	68.7	E	1.6	None
		WkEnd PM	74.2	E	74.8	E	0.6	None
2. Cedros Avenue / Lomas Santa Fe Dr	Signal	WkDay PM	21.1	C	21.1	C	0.0	None
		WkEnd PM	22.1	C	22.1	C	0.0	None
3. I-5 SB Ramps / Lomas Santa Fe Dr	Signal	WkDay PM	22.5	C	24.1	C	1.6	None
		WkEnd PM	15.8	B	15.9	B	0.1	None
4. I-5 NB Ramps / Lomas Santa Fe Dr	Signal	WkDay PM	15.0	B	15.0	B	0.0	None
		WkEnd PM	12.7	B	12.7	B	0.0	None
5. S. Sierra Ave / Dahlia Dr	AWSC [d]	WkDay PM	8.2	A	8.3	A	0.1	None
		WkEnd PM	12.3	B	14.3	B	2.0	None
6. Hwy 101 / Dahlia Dr	Signal	WkDay PM	10.6	B	12.4	B	1.8	None
		WkEnd PM	12.1	B	12.4	B	0.3	None
7. Border Ave / S. Sierra Ave	[e]	WkDay PM	[e]	[e]	13.0	B	N/A	N/A
		WkEnd PM	[e]	[e]	12.0	B	N/A	N/A
8. Hwy 101 (Border Ave) / Via De La Valle (Camino Del Mar)	Signal	WkDay PM	25.0	C	25.4	C	0.4	None
		WkEnd PM	24.1	C	26.8	C	2.7	None

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TABLE 11–4 (CONTINUED)
EXISTING + PROJECT + CUMULATIVE PROJECTS INTERSECTION OPERATIONS – DURING HORSE RACES

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Project + Cumulative Projects		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
9. Via De La Valle/ S. Cedros Ave	MSSC	WkDay PM	**40.6**	**E**	**48.1**	**E**	**7.5**	**Direct**
		WkEnd PM	21.4	C	22.1	C	0.7	None
10. Via De La Valle/ Jimmy Durante Blvd	Signal	WkDay PM	46.4	D	**54.0**	**D**	**7.6**	**Direct**
		WkEnd PM	32.2	C	35.3	D	3.1	None
11. Via De La Valle / I-5 SB Ramps	Signal	WkDay PM	12.3	B	12.7	B	0.4	None
		WkEnd PM	10.5	B	10.8	B	0.3	None
12. Via De La Valle / I-5 NB Ramps	Signal	WkDay PM	27.9	C	28.4	C	0.5	None
		WkEnd PM	26.8	C	27.3	C	0.5	None
13. Camino Del Mar/ 27th St	AWSC [f]	WkDay PM	**165.1**	**F**	**169.4**	**F**	**4.3**	**Direct**
		WkEnd PM	**41.7**	**E**	**43.7**	**E**	**2.0**	**Direct**
14. Camino Del Mar/ Coast Blvd	AWSC	WkDay PM	**285.3**	**F**	**290.0**	**F**	**4.7**	**Direct**
		WkEnd PM	**112.7**	**F**	**117.2**	**F**	**4.5**	**Direct**
15. Camino Del Mar/ L'Auberge Del Mar	Signal	WkDay PM	9.2	A	9.5	A	0.3	None
		WkEnd PM	8.6	A	9.5	A	0.9	None
16. Camino Del Mar/ 15th St	Signal	WkDay PM	32.2	C	32.6	C	0.4	None
		WkEnd PM	32.6	C	33.3	C	0.7	None

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TABLE 11–4 (CONTINUED)
EXISTING + PROJECT + CUMULATIVE PROJECTS INTERSECTION OPERATIONS – DURING HORSE RACES

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Project + Cumulative Projects		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
17. Camino Del Mar/ Del Mar Heights Rd	MSSC	WkDay PM	175.7	F	176.2	F	0.5	None
		WkEnd PM	127.6	F	128.7	F	1.1	None
18. Camino Del Mar/ Carmel Valley Rd	Signal	WkDay PM	28.9	C	29.6	C	0.7	None
		WkEnd PM	13.9	B	14.2	B	0.3	None
19. Via de la Valle / Solana Cir	MSSC	WkDay PM	24.1	C	25.9	D	1.8	None
		WkEnd PM	17.5	C	18.5	C	1.0	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to the Project.
d. AWSC – All-Way Stop Controlled intersection. Minor street left turn delay is reported.
e. Turn in the road. No traffic control exists.
f. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay is reported.

General Notes:

WkDay AM – Weekday AM
WkDay PM – Weekday PM
N/A – Not Applicable

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 11–5
NEAR-TERM STREET SEGMENT OPERATIONS – DURING HORSE RACES (WEEKDAY)

Street Segment	Functional Classification [a]	Capacity (LOS E)	Existing + Cumulative Projects			Existing + Cumulative Projects + Project			Δ V/C [d]	Impact Type
			ADT	LOS [b]	V/C [c]	ADT	LOS	V/C		
S. Sierra Avenue										
Del Mar Shore Ter to Beach Club Dr	Minor Collector [g]	8,000	4,480	C	0.560	4,540	C	0.568	0.008	None
Highway 101										
Lomas Santa Fe Dr to Dahlia Dr	4-ln Major Arterial	37,000	19,870	B	0.537	20,070	B	0.542	0.005	None
Dahlia Dr to Via De La Valle	4-ln Major Arterial	37,000	21,100	B	0.570	21,300	B	0.576	0.006	None
Camino Del Mar										
Via De La Valle to 27th St	Comm Collector [g]	19,000	18,150	E	0.955	18,300	E	0.963	0.008	None
27th St to Coast Blvd	Comm Collector [g]	19,000	19,750	F	1.039	19,900	F	1.047	0.008	None
Coast Blvd to Jimmy Durante Blvd	Comm Collector [g]	19,000	13,630	D	0.717	13,760	D	0.724	0.007	None
Via De La Valle										
Hwy 101 to S. Cedros Ave	Town Collector	19,000	19,300	F	1.016	20,300	F	1.068	0.052	None [e]
S. Cedros Ave to Jimmy Durante Blvd	Town Collector	19,000	24,850	F	1.308	25,820	F	1.359	0.051	None [e]
Jimmy Durante Blvd to I-5 SB Ramps	4-ln Major Arterial [f]	40,000	49,090	E	0.982	50,010	F	1.000	0.018	None [e]

Footnotes:

a. The San Diego County capacity at which the roadway currently functions.
b. Level of Service.
c. The Volume / Capacity ratio.
d. Increase in V/C ratio due to the addition of project traffic.
e. Not an impact. See text for explanation.
f. A third eastbound through lane is provided along this segment, which merges into the I-5 SB on-ramp. Hence the capacity of an additional lane is assumed.

TABLE 11-6
NEAR-TERM PEAK HOUR ARTERIAL ANALYSIS – DURING HORSE RACES WEEKDAY
VIA DE LA VALLE: HIGHWAY 101 TO I-5

Direction	Existing + Cumulative Projects						Existing + Cumulative Projects + Project					
	AM			PM			AM			PM		
	Time [a]	Speed [b]	LOS	Time	Speed	LOS	Time	Speed	LOS	Time	Speed	LOS
Eastbound	122.2	24.7	C	126.6	23.9	C	121.1	25.0	C	124.4	24.3	C
Westbound	144.2	21.0	D	121.7	24.8	C	123.6	24.5	C	158.2	19.1	D

Footnotes:

a. Time in Seconds
b. Speed in miles per hour.

12.0 ANALYSIS OF LONG-TERM SCENARIOS

12.1 Year 2035 Horizon Year Traffic Volumes

Year 2035 volumes were obtained from the Series 12 Regional model. In order to determine the Year 2035 "with Project" volumes, the assigned Project traffic volumes were added to the Year 2035 volumes. On some segments, the Year 2035 volumes were less than the Existing + Cumulative projects volumes. In those cases, the Year 2035 volumes were assumed to be 10% in excess of the Existing + Cumulative projects volumes.

The SANDAG Model outputs daily segment and peak hour volumes. However, the SANDAG Model output is not as accurate in determining peak hour intersection turn movements. Therefore, Year 2035 peak hour turning movement volumes were estimated using a template in Excel developed by LLG to determine peak hour traffic at an intersection from future (Year 2035) ADT volumes using the relationship between existing peak hour turn movements and the existing ADT volumes. This same relationship can be assumed to generally continue in the future. For example, if the segment ADT on the roadway is forecast to double by the Year 2035, it is reasonable to assume that the peak hour intersection turning movement volumes will generally double.

Figure 12–1 depicts the Year 2035 Without Project traffic volumes, while ***Figure 12–2*** depicts the Year 2035 With Project traffic volumes.

12.2 Year 2035 Analyses

12.2.1 *Intersection Analysis*

The Year 2035 analysis used existing roadway network and intersection geometry. ***Table 12-1*** summarizes the Year 2035 without Project peak hour intersection operations. As seen in *Table 12-1*, in the Year 2035 without project, the following study area intersections are calculated to operate at LOS E or better worse:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **I-5 SB Ramps / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Highway 101 (Camino Del Mar) / Via De La Valle (Border Avenue)** (LOS E during the PM peak hour)
- **Via De La Valle / S. Cedros Avenue** (SB left-turn LOS F during the AM and PM peak hours)
- **Via De La Valle / Jimmy Durante Boulevard** (LOS E during the AM and PM peak hours)
- **Camino Del Mar / 27th Street** (LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS E during the AM peak hour and LOS F during the PM peak hour)

Appendix N contains the Year 2035 without Project peak hour intersection analysis worksheets.

12.2.2 *Daily Street Segment Levels of Service*

Table 12-2 summarizes the Year 2035 without Project segment operations. As seen in *Table 12-2*, in the Year 2035 without project, all study area segments are calculated to currently operate at LOS D or better except the following:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS E)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS F)

12.2.3 *Freeway Mainline Segments*

Table 12-3 summarizes the Year 2035 without Project Freeway Mainline segment operations. As seen in *Table 12-3*, in the Year 2035 without Project the following Freeway Mainline segments are calculated to operate at LOS E or worse:

- **I-5: Lomas Santa Fe Drive and Via De La Valle** – In the NB direction, LOS F(0) during the PM peak hour and in the SB direction, LOS F(2) during the AM peak hour and LOS F(0) during the PM peak hour
- **I-5: Via De La Valle and Del Mar Heights Road** – In the NB direction, LOS F(0) during the AM peak hour and F(2) during the PM peak hour and in the SB direction, LOS F(2) during the AM peak hour and LOS F(0) during the PM peak hour
- **I-5: Del Mar Heights Road and SR 56** – In the NB direction, LOS F(0) during the PM peak hour and in the SB direction, LOS F(0) during the AM peak hour and LOS E during the PM peak hour

12.2.4 *Freeway Metered On-Ramps*

Table 12–4 summarizes the Year 2035 without Project Metered On-Ramp operations using the fixed rate analysis methodology. As shown in *Table 12–4*, no delay is calculated during the AM and PM peak hours using this methodology. This is due to the fact that the ramp meter discharge rate exceeds the peak hour demand. It is widely accepted among the industry that this methodology lacks accuracy in depicting "real world" conditions and often grossly overstates the calculated queues and delays.

12.3 Year 2035 + Project

12.3.1 *Intersection Analysis*

Table 12-1 summarizes the Year 2035 with Project peak hour intersection operations. As seen in *Table 10-1*, in the Year 2035 with project, all study area intersections are calculated to currently operate at LOS D or better except the following:

- **Highway 101 / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **I-5 SB Ramps / Lomas Santa Fe Drive** (LOS E during the PM peak hour)
- **Highway 101 (Camino Del Mar) / Via De La Valle (Border Avenue)** (LOS E during the PM peak hour)
- **Via De La Valle / S. Cedros Avenue** (SB left-turn LOS F during the AM and PM peak hours)

- **Via De La Valle / Jimmy Durante Boulevard** (LOS E during the AM peak hour and LOS F during the PM peak hour)
- **Camino Del Mar / 27th Street** (LOS E during the PM peak hour)
- **Camino Del Mar / Coast Boulevard** (LOS F during the PM peak hour)
- **Camino Del Mar / Del Mar Heights Road** (LOS E during the AM peak hour and LOS F during the PM peak hour)

The increase in delay due to project traffic is less than the allowable 2.0 seconds at the Highway 101 / Lomas Santa Fe Drive, I-5 SB Ramps / Lomas Santa Fe Drive and the Camino Del Mar / Del Mar Heights Road intersections. Hence, significant impacts are not calculated at these intersections. However, significant impacts are calculated at the remaining five intersections.

The Year 2035 with Project peak hour intersection analysis worksheets are included in ***Appendix O***.

12.3.2 *Daily Street Segment Levels of Service*

Table 12-2 summarizes the Year 2035 with Project segment operations. As seen in *Table 10-2*, in the Year 2035 with project, all study area segments are calculated to currently operate at LOS D or better except the following:

- **Camino Del Mar:** Via De La Valle to 27th Street (LOS E)
- **Via De La Valle:** Hwy 101 to S. Cedros Avenue (LOS F)
- **Via De La Valle:** S. Cedros Avenue to Jimmy Durante Boulevard (LOS F)
- **Via De La Valle:** Jimmy Durante Boulevard to I-5 SB Ramps (LOS F)

The increase in V/C ratio due to the project traffic is less than the allowable 0.02 for the segment of Camino Del Mar between Via De La Valle and 27th Street.

The increase in V/C on the segments along Via De La Valle indicates a potential significant impact. ***Table 12-5*** summarizes the peak hour arterial analysis along Via De La Valle. As seen in *Table 12-5*, the level of service based on the calculated speed along this corridor of Via De La Valle between I-5 and Highway 101 is LOS D or better. Since peak hour operations are more indicative of actual operations than ADT operations, based on the peak hour arterial analysis, no significant impact is calculated on these segments.

12.3.3 *Freeway Mainline Segments*

Table 12-6 summarizes the Year 2035 with Project Freeway Mainline segment operations. As seen in *Table 12-6*, in the Year 2035 with the addition of Project traffic, the following Freeway Mainline segments are calculated to operate at LOS E or worse:

- **I-5: Lomas Santa Fe Drive and Via De La Valle** – In the NB direction, LOS F(0) during the PM peak hour and in the SB direction, LOS F(2) during the AM peak hour and LOS F(0) during the PM peak hour
- **I-5: Via De La Valle and Del Mar Heights Road** – In the NB direction, LOS F(0) during the AM peak hour and F(2) during the PM peak hour and in the SB direction, LOS F(2) during the AM peak hour and LOS F(0) during the PM peak hour

- **I-5: Del Mar Heights Road and SR 56** – In the NB direction, LOS F(0) during the PM peak hour and in the SB direction, LOS F(0) during the AM peak hour and LOS E during the PM peak hour

The increase in V/C ratio due to the project traffic is less than the allowable 0.01 for segments operating at LOS E. Hence, no significant impacts are calculated.

12.3.4 *Freeway Metered On-Ramps*

Table 12–4 summarizes the Year 2035 with Project Metered On-Ramp operations using the fixed rate analysis methodology. As shown in *Table 12–4*, no delay is calculated during the AM and PM peak hours using this methodology. This is due to the fact that the ramp meter discharge rate exceeds the peak hour demand. It is widely accepted among the industry that this methodology lacks accuracy in depicting "real world" conditions and often grossly overstates the calculated queues and delays.

TABLE 12–1
YEAR 2035 INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Year 2035		Year 2035 + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay AM	45.0	D	45.5	D	0.5	None
		WkDay PM	77.4	E	78.3	E	0.9	None
2. Cedros Avenue / Lomas Santa Fe Dr	Signal	WkDay AM	32.7	C	37.1	D	4.4	None
		WkDay PM	27.8	C	37.7	D	9.9	None
3. I-5 SB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	23.3	C	23.5	C	0.2	None
		WkDay PM	57.7	E	58.5	E	0.8	None
4. I-5 NB Ramps / Lomas Santa Fe Dr	Signal	WkDay AM	17.0	B	17.0	B	0.0	None
		WkDay PM	15.3	B	15.4	B	0.1	None
5. S. Sierra Ave / Dahlia Dr	AWSC [d]	WkDay AM	9.0	A	9.0	A	0.0	None
		WkDay PM	10.3	B	10.3	B	0.0	None
6. Hwy 101 / Dahlia Dr	Signal	WkDay AM	4.0	A	4.0	A	0.0	None
		WkDay PM	2.4	A	2.4	A	0.0	None
7. Border Ave / S. Sierra Ave	[e]	WkDay AM	[e]	[e]	12.9	B	N/A	N/A
		WkDay PM	[e]	[e]	16.5	C	N/A	N/A
8. Hwy 101 (Border Ave) / Via De La Valle (Camino Del Mar)	Signal	WkDay AM	17.6	B	19.1	B	1.5	None
		WkDay PM	**60.6**	**E**	**63.9**	**E**	**3.3**	**Cumulative**

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TABLE 12–1 (CONTINUED)
YEAR 2035 INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Year 2035		Year 2035 + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay [a]	LOS [b]		
9. Via De La Valle/ S. Cedros Ave	MSSC [f]	WkDay AM	**50.4**	**F**	**58.7**	**F**	**8.3**	**Cumulative**
		WkDay PM	**130.2**	**F**	**159.1**	**F**	**28.9**	**Cumulative**
10. Via De La Valle/ Jimmy Durante Blvd	Signal	WkDay AM	**59.5**	**E**	**62.0**	**E**	**2.5**	**Cumulative**
		WkDay PM	**75.9**	**E**	**79.2**	**E**	**3.3**	**Cumulative**
11. Via De La Valle / I-5 SB Ramps	Signal	WkDay AM	12.9	B	13.5	B	0.6	None
		WkDay PM	12.9	B	13.4	B	0.5	None
12. Via De La Valle / I-5 NB Ramps	Signal	WkDay AM	27.7	C	28.1	C	0.4	None
		WkDay PM	33.5	C	34.6	C	1.1	None
13. Camino Del Mar/ 27th St	AWSC	WkDay AM	20.3	C	20.8	C	0.5	None
		WkDay PM	**45.5**	**E**	**47.8**	**E**	**2.3**	**Cumulative**
14. Camino Del Mar/ Coast Blvd	AWSC	WkDay AM	20.1	C	20.8	C	0.7	None
		WkDay PM	**103.5**	**F**	**107.4**	**F**	**3.9**	**Cumulative**
15. Camino Del Mar/ L'Auberge Del Mar	Signal	WkDay AM	6.7	A	6.7	A	0.0	None
		WkDay PM	11.5	B	11.5	B	0.0	None
16. Camino Del Mar/ 15th St	Signal	WkDay AM	22.5	C	22.6	C	0.1	None
		WkDay PM	34.5	C	34.9	C	0.4	None

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TABLE 12–1 (CONTINUED)
YEAR 2035 INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Year 2035		Year 2035 + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay [a]	LOS [b]		
17. Camino Del Mar/ Del Mar Heights Rd	Signal	WkDay AM	67.7	E	68.7	E	1.0	None
		WkDay PM	193.0	F	194.0	F	1.0	None
18. Camino Del Mar/ Carmel Valley Rd	Signal	WkDay AM	32.2	C	33.0	C	0.8	None
		WkDay PM	33.0	C	33.9	C	0.9	None
19. Via de la Valle / Solana Circ	MSSC	WkDay AM	26.6	D	28.1	D	1.5	None
		WkDay PM	26.6	D	28.4	D	1.8	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to the Project.
d. AWSC – All-Way Stop Controlled intersection. Minor street left turn delay is reported.
e. Turn in the road. No traffic control exists.
f. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay is reported.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

General Notes:

WkDay AM – Weekday AM
WkDay PM – Weekday PM
N/A – Not Applicable

TABLE 12–2
LONG-TERM STREET SEGMENT OPERATIONS

Street Segment	Functional Classification	Capacity (LOS E)	Year 2035 No Project			Year 2035 + Project			Δ V/C [d]	Impact Type
			ADT	LOS [b]	V/C [c]	ADT	LOS	V/C		
S. Sierra Avenue										
Del Mar Shore Ter to Beach Club Dr	Minor Collector	8,000	3,900	B	0.488	3,960	B	0.495	0.007	None
Highway 101										
Lomas Santa Fe Dr to Dahlia Dr	4-ln Major Arterial	37,000	22,500	B	0.608	22,700	B	0.614	0.006	None
Dahlia Dr to Via De La Valle	4-ln Major Arterial	37,000	26,600	C	0.719	26,800	C	0.724	0.005	None
Camino Del Mar										
Via De La Valle to 27th St	Comm Collector	19,000	18,200	E	0.958	18,350	E	0.966	0.008	None
27th St to Coast Blvd	Comm Collector	19,000	13,400	C	0.705	13,550	D	0.713	0.008	None
Coast Blvd to Jimmy Durante Blvd	Comm Collector	19,000	10,100	B	0.532	10,230	B	0.538	0.006	None
Via De La Valle										
Hwy 101 to S. Cedros Ave	Town Collector	19,000	19,000	E	1.000	20,000	F	1.053	0.053	None [e]
S. Cedros Ave to Jimmy Durante Blvd	Town Collector	19,000	21,700	F	1.142	22,670	F	1.193	0.051	None [e]
Jimmy Durante Blvd to I-5 SB Ramps	4-ln Major Arterial [f]	50,000	52,900	F	1.058	53,820	F	1.076	0.018	None [e]

Footnotes:

a. The San Diego County capacity at which the roadway currently functions.
b. Level of Service.
c. The Volume / Capacity ratio.
d. Increase in V/C ratio due to the addition of project traffic.
e. Not an impact. See text for explanation.
f. A third eastbound through lane is provided along this segment, which merges into the I-5 SB on-ramp. Hence the capacity of an additional lane is assumed.

TABLE 12–3
YEAR 2035 WITHOUT PROJECT FREEWAY MAINLINE SEGMENT OPERATIONS

Freeway Segment	Dir.	# of Lanes	Hourly Cap [a]	AADT [b]	K Factor		D Factor		Truck Factor [c]	Peak Hour Volume [d]		V/C [e]		LOS	
					AM	PM	AM	PM		AM	PM	AM	PM	AM	PM
Interstate 5															
Lomas Santa Fe Dr to Via De La Valle	NB	5ML + 1Aux+ 2 HOV	12,000	307,200	0.0752	0.0798	0.4446	0.5476	0.9309	11,033	14,421	0.919	1.202	D	F(0)
	SB	4ML + 1Aux + 2 HOV	10,200		0.0752	0.0798	0.5554	0.4524		13,783	11,914	1.351	1.168	F(2)	F(0)
Via De La Valle to Del Mar Heights Rd	NB	5ML + 1HOV	10,000	301,100	0.0752	0.0798	0.4446	0.5476	0.9309	10,814	14,134	1.081	1.413	F(0)	F(2)
	SB	5ML + 1HOV	10,000		0.0752	0.0798	0.5554	0.4524		13,509	11,677	1.351	1.168	F(2)	F(0)
Del Mar Heights Rd to SR 56	NB	5ML + 1Aux+2HOV	12,000	306,400	0.0752	0.0798	0.4446	0.5476	0.9309	11,005	14,383	0.917	1.199	D	F(0)
	SB	5ML + 1Aux+2HOV	12,000		0.0752	0.0798	0.5554	0.4524		13,747	11,883	1.146	0.990	F(0)	E

Footnotes:

a. Capacity calculated at 1800 vph per lane and 1000 vph per Auxiliary lane and HOV lane
b. Year 2035 without Project traffic from Series 12 2035 volumes from SANDAG.
c. Truck Factor from "2016 Annual Average Daily Truck Traffic on the California State Highway System".
d. Peak Hour Volumes factored using Passenger Car Equivalent for trucks.
e. V/C = (Peak Hour volume/Truck Factor/Capacity)

LOS	v/c
A	<0.41
B	0.62
C	0.80
D	0.92
E	1.00
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 12–4
LONG-TERM METERED RAMPS OPERATIONS

Location/Condition	Peak Hour Flow (F) (veh/hr/ln) [a]	Calculated (Most Restrictive)			
		Discharge Rate [b] (veh/hr/ln)	Excess Demand E (veh/hr/ln)	Delay (min/ln)	Queue
EB Via De La Valle to SB I-5					1 SOV + 1 HOV
AM					
SOV					
Year 2035	978	996	0	0	0
Project	16				
Year 2035 + Project	994	996	0	0	0
HOV [b]					
Year 2035	173	996	0	0	0
Project	3				
Year 2035 + Project	175	996	0	0	0
PM					
SOV					
Year 2035	927	996	0	0	0
Project	20				
Year 2035 + Project	947	996	0	0	0
HOV [b]					
Year 2035	164	498	0	0	0
Project	4				
Year 2035 + Project	167	498	0	0	0
EB Via De La Valle to NB I-5					2 SOV
PM					
SOV					
Year 2035	250	372	0	0	0
Project	12				
Year 2035 + Project	2621	372	0	0	0

Footnotes:

a. Existing volumes - Average of volumes from March through April 2017, from PeMS.
b. Discharge rates obtained from Caltrans (*Appendix A*).
c. A 15% Reduction in volume is applied to the volume in SOV lanes due to HOV lane

General Notes:

SOV – Single Occupancy Vehicle Lane
HOV – High Occupancy Vehicle Lane

TABLE 12–5
VIA DE LA VALLE YEAR 2035 + PROJECT PEAK HOUR ARTERIAL ANALYSIS – TYPICAL WEEKDAY

Direction	Year 2035						Year 2035+ Project [c]					
	AM			PM			AM			PM		
	Time [a]	Speed [b]	LOS	Time	Speed	LOS	Time	Speed	LOS	Time	Speed	LOS
Eastbound	148.1	20.4	D	138.8	21.8	D	137.3	18.6	D	117.9	21.7	D
Westbound	136.4	22.2	C	159.9	18.9	D	82.7	30.9	B	89.3	28.6	B

Footnotes:

a. Time in seconds.
b. Speed in miles per hour
c. Includes recommended improvements.

TABLE 12–6
YEAR 2035 + PROJECT FREEWAY MAINLINE SEGMENT OPERATIONS

Freeway Segment	Dir	# of Lanes	Hourly Cap [a]	AADT	Peak Hour Traffic						V/C [h]				LOS		Δ V/C	
					Year 2035 [b]		Project [c]		Year 2035 + Project		Year 2035		Year 2035 + Project					
					AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Interstate 5																		
Lomas Santa Fe Drive to Via De La Valle	NB	5ML + 1Aux+ 2 HOV	12,000	307,960	11,033	14,421	10	12	11,043	14,433	0.919	1.202	0.920	1.203	D	F(0)	0.001	0.001
	SB	4ML + 1Aux + 2 HOV	10,200		13,783	11,914	10	13	13,793	11,927	1.351	1.168	1.352	1.169	F(2)	F(0)	0.001	0.001
Via De La Valle to Del Mar Heights Road	NB	5ML + 1HOV	10,000	302,360	10,814	14,134	20	25	10,834	14,159	1.081	1.413	1.083	1.416	F(0)	F(2)	0.002	0.002
	SB	5ML + 1HOV	10,000		13,509	11,677	19	24	13,528	11,701	1.351	1.168	1.353	1.170	F(2)	F(0)	0.002	0.002
Del Mar Heights Road to SR 56	NB	5ML + 1Aux+2HOV	12,000	307,660	11,005	14,383	20	25	11,025	14,408	0.917	1.199	0.919	1.201	D	F(0)	0.002	0.002
	SB	5ML + 1Aux+2HOV	12,000		13,747	11,883	19	24	13,766	11,907	1.146	0.990	1.147	0.992	F(0)	E	0.002	0.002

Footnotes:

a. Capacity calculated at 1800 vph per lane and 1000 vph per Auxiliary lane as explained in the text.
b. Existing Average Annual Daily Traffic Volumes from Caltrans PeMS June 2017).
c. V/C = (Peak Hour volume/Truck Factor/Capacity)
d. Project traffic at the ramps.

LOS	v/c
A	<0.41
B	0.62
C	0.8
D	0.92
E	1.00
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

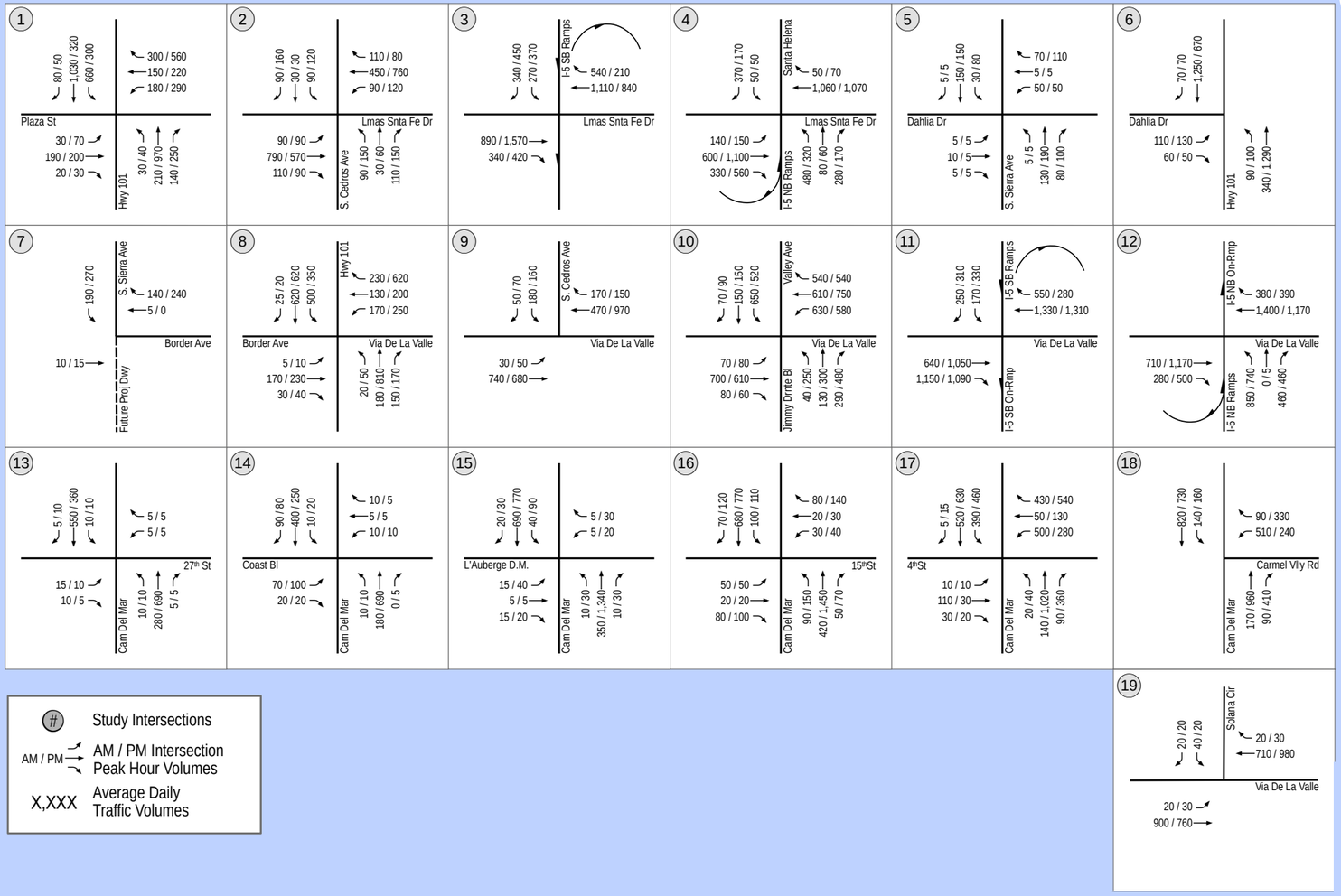

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Figure 12-1

Year 2035 Traffic Volumes

Typical Weekday

DEL MAR RESORT

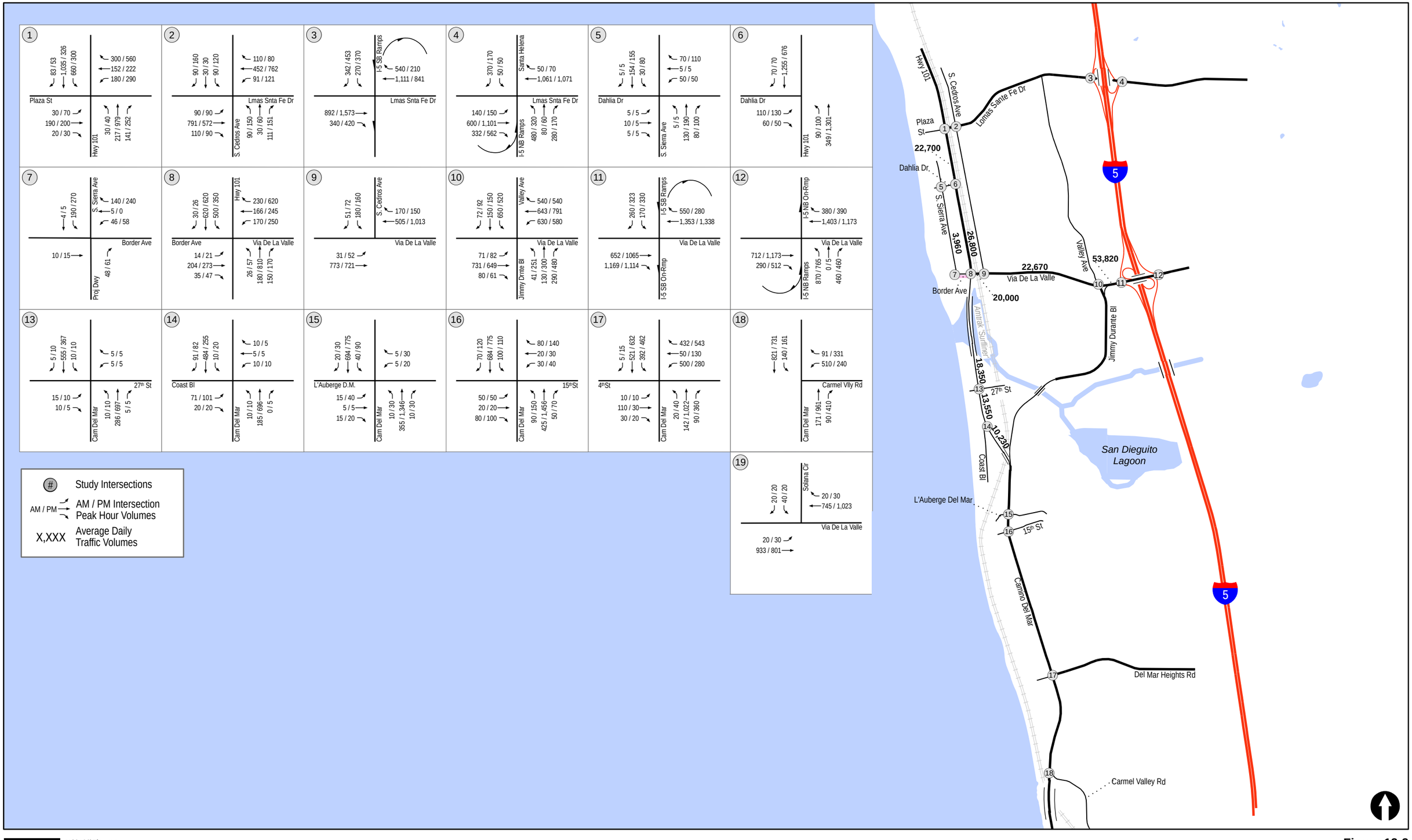

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Figure 12-2

Year 2035 + Project Traffic Volumes

Typical Weekday

DEL MAR RESORT

13.0 ALTERNATE PROJECT TRAFFIC ASSIGNMENT

An alternate analysis was conducted at the intersection along Lomas Santa Fe Drive during the Fair and the Horse Races to address a potentially higher percentage of Project traffic using Lomas Santa Fe Drive to access the site instead of Via de la Valle. The SANDAG model forecasted 5% of Project traffic using Lomas Santa Fe Drive during typical times of the year. In order to estimate the amount of traffic that would utilize Lomas Santa Fe Drive due to the Fair and Horse Races, the existing Fair, Horse Races and non-event volumes in the following key movements were compared, at the Highway 101 / Lomas Santa Fe Drive:

- Total entering volumes in the AM and PM peak hour
- Westbound left-turn, Northbound right-turn, Southbound left-turn and Westbound Right-turn volumes in the AM and PM peak hour.

It was determined that the volumes during the fair and the horse races are not always higher than the typical weekday or weekend volumes. In some movements, the volumes were found to decrease. The average increase varied between 9% and 21% over the Typical Weekday. The SANDAG SZA analysis conducted for a typical weekday indicated that 5% of the project traffic would utilize Lomas Santa Fe Drive. Even though the comparison of volumes discussed above showed a maximum increase of 21% over the Typical Weekday, for a conservative analysis, it was assumed that the project traffic using Lomas Santa Fe Drive would double (not increase by 21%) during the Fair and Horse Races.

13.1 During the Fair

13.1.1 *Existing + Project*

As mentioned previously, Existing traffic volume data was collected for only two intersections in the City of Solana Beach during the Fair. Therefore, analysis was conducted only at two intersections during the Fair. ***Table 13–1*** summarizes the Levels of service with the addition of Project traffic during the Fair, assuming a 100% increase in Project traffic on Lomas Santa Fe Drive. Only the intersections affected by the reassignment of project traffic are included in this table. As seen in *Table 13-1*, with the addition of Cumulative projects traffic, the two intersections are calculated to operate at LOS D or better.

Appendix P-1 contains the peak hour intersection analysis worksheets for the Existing + Project scenario with the Fair.

13.1.2 *Existing + Cumulative Projects*

Table 13–1 summarizes the Levels of service with the addition of Cumulative Projects traffic during the Fair. As seen in *Table 13-1*, with the addition of Cumulative Projects traffic, the two intersections are calculated to operate at LOS D or better.

Appendix P-2 contains the peak hour intersection analysis worksheets for the Existing + Cumulative Projects.

TABLE 13–1
NEAR-TERM INTERSECTION OPERATIONS WITH ALTERNATE PROJECT DISTRIBUTION – DURING FAIR

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay AM	31.7	C	31.9	C	0.2	None
		WkDay PM	48.6	D	49.2	D	0.6	None
		WkEnd PM	40.5	D	44.3	D	3.8	None
6. Hwy 101 / Dahlia Dr	Signal	WkDay AM	6.9	A	6.9	A	0.0	None
		WkDay PM	8.2	A	8.2	A	0.0	None
		WkEnd PM	6.5	A	6.5	A	0.0	None

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Project + Cumulative Projects		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay AM	32.2	C	32.4	C	0.2	None
		WkDay PM	52.3	D	53.0	D	1.4	None
		WkEnd PM	49.5	D	50.0	D	0.5	None
6. Hwy 101 / Dahlia Dr	Signal	WkDay AM	10.1	B	10.1	B	0.0	None
		WkDay PM	14.6	B	14.7	B	0.1	None
		WkEnd PM	12.6	B	12.6	B	0.0	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to the Project.

General Notes:

WkDay AM – Weekday AM
WkDay PM – Weekday PM
WkEnd PM – Weekend PM

SIGNALIZED

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
≥ 80.1	F

13.1.3 *Existing + Project + Cumulative Projects*

Table 13–1 summarizes the Levels of service with the addition of Cumulative Projects and Project traffic during the Fair. As seen in *Table 13-1*, with the addition of Project traffic, the two intersections are calculated to operate at LOS D or better. ***Appendix P-3*** contains the peak hour intersection analysis worksheets for the Existing + Project + Cumulative Projects scenarios with the Fair.

13.2 During the Horse Races

13.2.1 *Existing + Project*

Table 13–2 summarizes the Levels of service with the addition of Project traffic during Horse Races, assuming a 100% increase in Project traffic on Lomas Santa Fe Drive. As seen in *Table 13-2*, with the addition of Project traffic, the Highway 101 / Lomas Santa Fe Drive intersection is calculated to operate at LOS E during the AM and PM peak hours. However, the increase in delay due to the project traffic is less than the allowable 2.0 seconds. Hence, the Project does not have a significant direct impact at this intersection. ***Appendix Q-1*** contains the peak hour intersection analysis worksheets for the Existing + Project scenario with Horse Races.

13.2.2 *Existing + Cumulative Projects*

Table 13–3 summarizes the Levels of service with the addition of Cumulative Projects traffic during Horse Races. As seen in *Table 13-3*, with the addition of Cumulative Projects traffic, the Highway 101 / Lomas Santa Fe Drive intersection is calculated to operate at LOS E during the AM and PM peak hours. ***Appendix Q-2*** contains the peak hour intersection analysis worksheets for the Existing + Cumulative Projects

13.2.3 *Existing + Project + Cumulative Projects*

Table 13–3 summarizes the Levels of service with the addition of Project and Cumulative Projects traffic during Horse Races. As seen in *Table 13-3*, with the addition of Cumulative Projects and Project traffic, the Highway 101 / Lomas Santa Fe Drive intersection is calculated to operate at LOS E during the AM and PM peak hours. However, the increase in delay due to the project traffic is less than the allowable 2.0 seconds. Hence, the Project does not have a significant direct impact at this intersection. ***Appendix Q-3*** contains the peak hour intersection analysis worksheets for the Existing + Project + Cumulative Projects scenarios with Horse Races.

13.3 Conclusions

From the above analyses, it is concluded that assuming a higher percentage of Project traffic would utilize Lomas Santa Fe Drive as an alternate route during the Fair and Horse Races, the Project would not have a significant direct or cumulative impact on the intersections along Lomas Santa Fe / in the City of Solana Beach.

TABLE 13–2
EXISTING + PROJECT INTERSECTION OPERATIONS – DURING HORSE RACES

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay PM	61.0	E	61.7	E	0.7	None
		WkEnd PM	68.1	E	68.5	E	0.4	None
2. Cedros Avenue / Lomas Santa Fe Dr	Signal	WkDay PM	20.7	C	20.7	C	0.0	None
		WkEnd PM	21.7	C	21.7	C	0.0	None
3. I-5 SB Ramps / Lomas Santa Fe Dr	Signal	WkDay PM	20.6	C	21.6	C	1.0	None
		WkEnd PM	14.7	B	15.0	B	0.3	None
4. I-5 NB Ramps / Lomas Santa Fe Dr	Signal	WkDay PM	14.3	B	14.3	B	0.0	None
		WkEnd PM	12.5	B	12.5	B	0.0	None
5. S. Sierra Ave / Dahlia Dr	MSSC [d]	WkDay PM	8.1	A	8.1	A	0.0	None
		WkEnd PM	13.6	B	13.9	B	0.3	None
6. Hwy 101 / Dahlia Dr	Signal	WkDay PM	5.8	A	7.5	A	1.7	None
		WkEnd PM	6.5	A	6.5	A	0.0	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to the Project.
d. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay is reported.

General Notes:

WkDay PM – Weekday PM
WkEnd PM – Weekend Peak

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 13–3
EXISTING + PROJECT + CUMULATIVE PROJECTS INTERSECTION OPERATIONS – DURING HORSE RACES

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects		Existing + Project + Cumulative Projects		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
1. Hwy 101 / Lomas Santa Fe Dr	Signal	WkDay PM	68.1	E	69.0	E	0.9	None
		WkEnd PM	74.2	E	74.5	E	0.3	None
2. Cedros Avenue / Lomas Santa Fe Dr	Signal	WkDay PM	21.1	C	21.1	C	0.0	None
		WkEnd PM	22.1	C	22.1	C	0.0	None
3. I-5 SB Ramps / Lomas Santa Fe Dr	Signal	WkDay PM	22.5	C	24.5	C	2.0	None
		WkEnd PM	15.8	B	15.9	B	0.1	None
4. I-5 NB Ramps / Lomas Santa Fe Dr	Signal	WkDay PM	15.0	B	15.0	B	0.0	None
		WkEnd PM	12.7	B	12.7	B	0.0	None
5. S. Sierra Ave / Dahlia Dr	MSSC [d]	WkDay PM	8.2	A	8.3	A	0.1	None
		WkEnd PM	12.3	B	14.3	B	2.0	None
6. Hwy 101 / Dahlia Dr	Signal	WkDay PM	10.7	B	12.4	B	1.7	None
		WkEnd PM	12.1	B	12.5	B	0.4	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to the Project.
d. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay is reported.

General Notes:

WkDay PM – Weekday PM
WkEnd PM – Weekend Pek

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

14.0 LOMAS SANTA FE DRIVE CORRIDOR STUDY

The City of Solana Beach is currently conducting a study to identify transportation issues and proposals along Lomas Santa Fe Drive from Highway 101 to Highland Drive. The analysis of this corridor has been divided into the following three sections:

- The western section from Highway 101 to Solana Hills Drive
- Caltrans Improvements from I-5 SB ramps to I-5 NB Ramps, and
- The Eastern Corridor from I-5 NB Ramps (Santa Helena) to Highland Drive

The purpose of the Lomas Santa Fe Drive Corridor Study is to identify ideas for improving driving, walking, and biking in Solana Beach. This project consists of four phases as outlined below. Currently, Phases I & II of this process have been completed.

- Phase I
  - Research
  - Fact Finding
  - Initial Recommendations

- Phase II
  - Feasibility Analysis
  - Preliminary Engineering
  - Cost Estimating

- Phase III
  - Environmental Review
  - 30% Design
  - Permitting
  - Project Funding

- Phase IV
  - Final Engineering
  - Construction

Further information regarding the Lomas Santa Fe Drive Corridor Study project is included in ***Appendix R-1***.

One of the ideas to improve traffic operations on this corridor is the modification of the existing intersection geometry at the Highway 101 / Lomas Santa Fe Drive intersection, by eliminating one westbound through lane. Since this intersection is within the study area of the Marisol Project. This section examines the effect of this modification.

14.1 Near-Term Analysis

Table 14-1 summarizes the results of the Near-Term peak hour intersection analysis for several scenario assuming the Lomas Santa Fe Drive Corridor improvement at this intersection is implemented. As seen in *Table 14-1*, in the near-term, with the addition of Project traffic, under all scenarios, the increase due to Project traffic is less than the allowable threshold, of 2.0 seconds, if the intersection is operating at LOS E or worse. In other scenarios, the intersection is calculated to operate at LOS D or better. Therefore, there is no impact due to the Project at this intersection.

The Near-Term peak hour intersection analysis worksheets are included in ***Appendix R-2***.

14.2 Long-Term Analysis

Table 14-2 summarizes the results of the Long-Term peak hour intersection analysis for several scenarios assuming the Lomas Santa Fe Drive Corridor improvement at this intersection is implemented. As seen in *Table 14-2*, with the addition of Project traffic, the subject intersection is calculated to operate at LOS F with a delay increase of less than 2.0 seconds. Thus, the Project would not have a significant cumulative impact.

The Long-Term peak hour intersection analysis worksheets are included in ***Appendix R-3***.

TABLE 14-1
LOMAS SANTA FE DRIVE CORRIDOR STUDY
NEAR-TERM INTERSECTION OPERATIONS AT THE HIGHWAY 101 / LOMAS SANTA FE DRIVE INTERSECTION

Scenario	Control Type	Peak Hour	Existing		Existing + Project		Δ Delay	Impact Type	Near-Term		Near-Term + Project		Δ Delay	Impact Type
			Delay [a]	LOS [b]	Delay	LOS			Delay	LOS	Delay	LOS		
Typical Weekday / Weekend	Signal	WkDay AM	33.7	D	33.9	D	0.2	None	35.2	D	35.5	D	0.3	None
		WkDay PM	49.9	D	50.5	D	0.6	None	55.4	E	55.9	E	0.5	None
		WkEnd PM	57.5	E	57.9	E	0.4	None	59.1	E	59.5	E	0.4	None
Weekday /Weekend During Fair	Signal	WkDay AM	33.0	C	33.1	C	0.1	None	33.5	C	33.6	C	0.1	None
		WkDay PM	53.4	D	53.8	D	0.4	None	57.2	E	57.8	E	0.6	None
		WkEnd PM	43.8	D	44.1	D	0.3	None	49.7	D	50.1	D	0.4	None
Weekday /Weekend During Horse Races	Signal	WkDay AM	56.8	E	57.3	E	0.5	None	61.3	E	61.7	E	0.4	None
		WkEnd PM	54.3	E	54.8	E	0.5	None	58.7	E	59.3	E	0.6	None

Footnotes:

a. Delay in seconds per vehicle.
b. Level of Service
c. Not a significant impact since the increase in delay due to the project is less than the significance threshold.

TABLE 14-2
LOMAS SANTA FE DRIVE CORRIDOR STUDY
LONG-TERM INTERSECTION OPERATIONS AT THE HIGHWAY 101 / LOMAS SANTA FE DRIVE INTERSECTION

Scenario	Control Type	Peak Hour	Year 2035		Year 2035 + Project		Δ Delay	Impact Type
			Delay[a]	LOS[b]	Delay	LOS		
Long-Term	Signal	AM	49.0	D	49.5	D	0.5	None
		PM	91.0	F	92.1	F	1.1	None

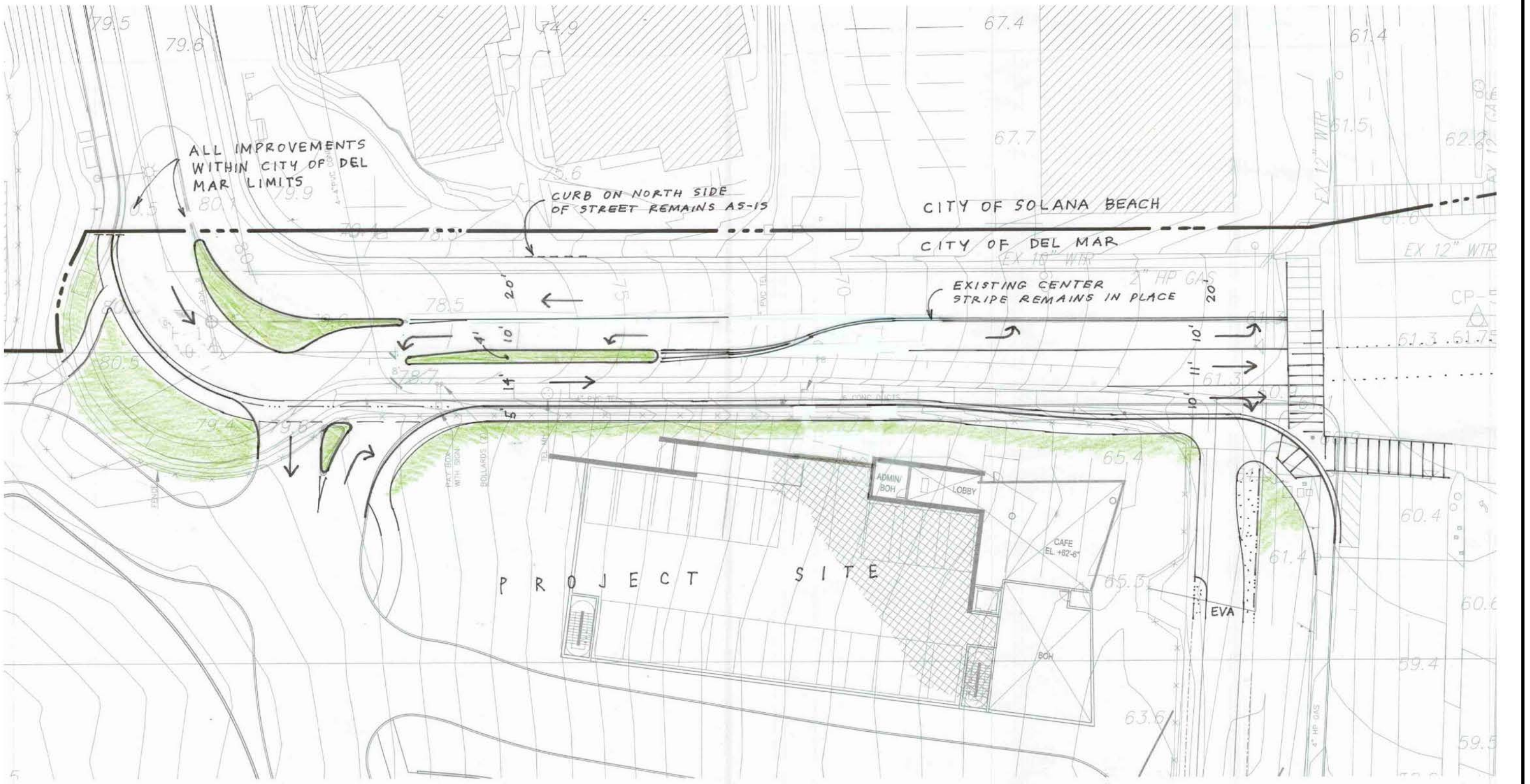
Footnotes:

a. Delay in seconds per vehicle.
b. Level of Service
c. Not a significant impact since the increase in delay due to the project is less than the significance threshold.

15.0 ACCESS

The only access to the project is proposed via Border Avenue, just east of S. Sierra Avenue. Raised medians would be provided on Border Avenue and S. Sierra Avenue at the Project entrance. This configuration would allow inbound left from Border Avenue, prohibit outbound project traffic from using Sierra Avenue and prohibit U-turns on Sierra Avenue southbound to northbound.

Figure 15–1 depicts the recommended median treatment at the Project driveway.



LINSCOTT LAW & GREENSPAN engineers

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Date: 06/24/19

Figure 15-1

Recommended Access Configuration

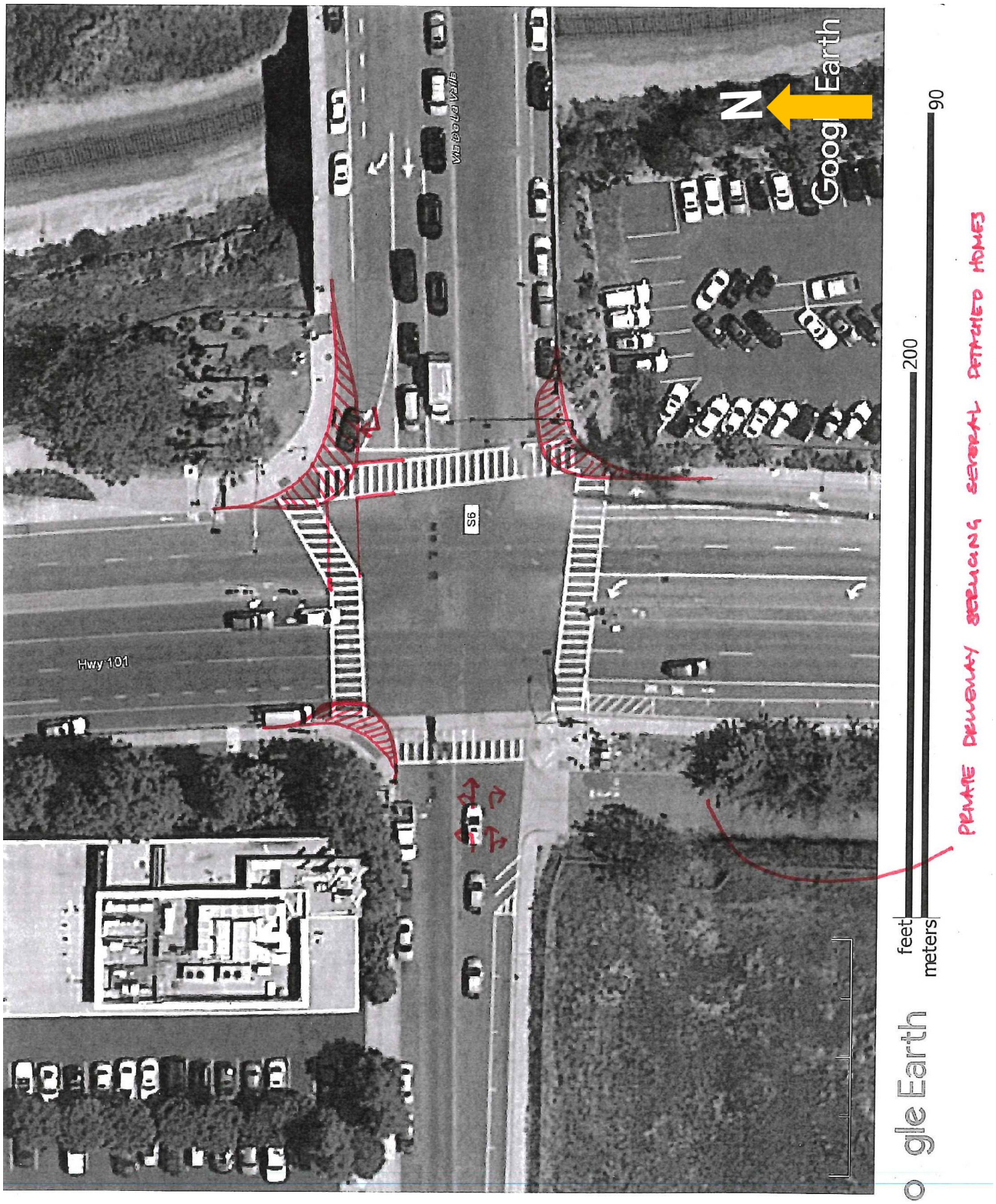
16.0 PEDESTRIAN ASSESSMENT

16.1 Pedestrian Improvements

The following pedestrian improvements / enhancements are recommended for consideration at the Via De La Valle / Highway 101 / Border intersection:

- Replace permissive phasing with protected or split phasing and increase the cycle length to provide additional crossing time for pedestrians. This is better for pedestrians as they can cross during a protected phase.
- Installing an Accessible Pedestrian Signal (APS)
- Evaluate walk timings to ensure long enough walk time for all pedestrians
- Evaluate and provide pedestrian / vehicle lag time.
- Provide bulb-outs (see aerial photo below) and other pedestrian improvements

The photo on the next page depicts these recommendations.


Hwy 101
S6
N
Google Earth
feet
meters
200
90
PRIVATE DRIVEWAY SERVICING SEVERAL DETACHED HOMES

17.0 TRANSPORTATION DEMAND MANAGEMENT (TDM)

Transportation Demand Management (TDM) Measures have been addressed in a separate report entitled *Marisol Transportation Demand Management Plan* dated November 12, 2019 and is included in ***Appendix S***. With the implementation of the recommended TDM plan, the Project generated trips will reduce by 12.2% during the weekday and 11.7% during the weekend. This equates to 172 fewer weekday Project trips and 193 fewer weekend Project trips.

18.0 CONSTRUCTION

18.1 Purpose

Following is a brief description of the construction traffic activities and schedule.

18.2 Schedule

The planned duration of construction is about 20 months, which includes 11 months of actual building construction. Several of the construction activities will overlap and hence, the duration of the construction is not expected to exceed 20 months.

18.3 Passenger Car Equivalency

Much of the traffic generated during construction consists of large trucks. The traffic performance of these heavy vehicles is significantly different from that of automobiles. The differences relate to vehicle acceleration and deceleration characteristics, as reflected in their weight-to-power ratios and lengths. Two categories of heavy vehicles are defined: single-unit trucks (SUTs) and tractor trailers (TTs). Buses and recreational vehicles are treated as SUTs in the HCM. Chapter 3, Modal Characteristics, provides a more detailed discussion of the types of heavy vehicles and compares the HCM and Federal Highway Administration (FHWA) vehicle classification schemes. FHWA Classifications 4 and 5 are treated as SUTs by the HCM, while FHWA Classifications 6 and higher are considered as TTs.

Two distinct methodologies are offered to assess the effect of heavy vehicles on capacity and LOS on freeways in the HCM:

1. Traditional passenger car equivalency (PCE) factors that allow the analyst to convert a mixed stream of cars and trucks to a single uniform PCE stream for purpose of analysis; and,
2. A mixed-flow model that directly assesses the capacity, speed, and density of traffic streams that include a significant percentage of heavy vehicles operating on a single or composite grade.

Per *Exhibit 12-25* PCEs for General Terrain Segments, Highway Capacity Manual (HCM) Version 6.0, the PCE for trucks is 2.0 for flat terrain. Based on the above discussion, a passenger car equivalency of 2.0 is applied to the truck trips to account for the reduction in capacity and the increase in density.

18.4 Construction Phase Generating the Highest Traffic

Table 18–1 summarizes the schedule for the various construction activities. The activities for each construction phase were reviewed. Two Phases, Grading and Building construction are estimated to generate the most traffic.

18.4.1 *Grading Phase Traffic*

The Grading Phase is estimated to generate a total of 692 daily trips. This comprises 334 daily Heavy Heavy Duty Truck (HHDT) trips. Applying the PCE factor, the total daily trips due to the construction

trips is 668. It is estimated that there will be 20 daily worker trips and 4 daily vendor trips, for a total of 692 daily trips during the Grading Phase.

18.4.2 *Building Construction Phase Traffic*

The Building Construction Phase is estimated to generate a total of 400 daily trips. It is estimated that there will be 300 daily worker trips (150 workers entering and leaving) and 100 daily vendor trips, for a total of 400 daily trips during the Building Construction Phase. Construction traffic during the remaining construction phases are estimated to be less than 64 ADT.

18.5 Haul Routes

Construction vehicles are recommended to utilize the I-5 to Via de la Valle access route.

18.6 Maximum Construction Traffic

As seen in *Table 18–1*, the maximum traffic generated during construction is 692 ADT during the Grading Phase of 1 month. Also, during the Building Construction Phase, the maximum traffic generated is 400 ADT trips over a period of 11 months.

This could be considered the "worst-case" traffic generated by construction traffic. It is assumed that all construction workers drive individually to the project site. No reduction due to carpooling or transit is assumed.

As seen above, the construction traffic is far less than the traffic generated by the post construction day-to-day project operations (1,408 during the weekday and 1,650 during the weekend). It is recommended that a construction traffic management plan be implemented to ensure the majority of construction trips would occur off-peak and that construction traffic utilize the I-5 travel route. Traffic control plans should also be implemented to ensure construction traffic moves safely to and from the Project site.

TABLE 18–1
ESTIMATED DURING CONSTRUCTION TRIP GENERATION

Phase Name	Phase Duration	Approximate Number of Working Days [a]	Truck Trips				Worker Trips		Vendor Trips		Total Daily Trips
			Number of Trucks	Total Truck Trips [b, c]	Daily Trips		Daily Round Trips [b]	Total Daily Trips	Daily Round Trips [b]	Total Daily Trips	
					Trucks	With PCE [d]					
Site Preparation and Demolition	0.5 Month	15	20	40	3	6	9	18	2	4	**28**
Grading	1 Months	30	5,000	10,000	334	668	10	20	2	4	**692**
Building Construction	11 Months	330	-	0	0	0	150	300	50	100	**400**
Paving	11 Months	330	-	0	0	0	10	20	2	4	**24**
Architectural Coating	0.75 Months	23	-	0	0	0	30	60	2	4	**64**

Footnotes:

a. Working Days include Monday through Friday.
b. Each trip represents one round trip to and from the site.
c. Truck trips are associated with import/export activities. The assumed capacity of each truck is 16 cubic yards.
d. Per Exhibit 12-25 PCEs for General Terrain Segments, Highway Capacity Manual (HCM) Version 6.0, the PCE for trucks is 2.0 for flat terrain (I-15).

19.0 SIGNIFICANCE OF IMPACTS AND MITIGATION MEASURES

19.1 Significance of Impacts

Based on the established significance criteria, the analyses of the study area intersections, segments, freeway mainline segments and metered ramps, the following direct and cumulative impacts are determined.

19.1.1 *Direct and Cumulative impacts*

Intersections:

- Via De La Valle / Cedros Avenue
- Via De La Valle / Jimmy Durante Boulevard
- Camino Del Mar / 27th Street
- Camino Del Mar / Coast Boulevard

Segments:

- Via De La Valle between Highway 101 and I-5 During Fair

Freeway Mainline Segments:

No significant direct impacts were calculated on any study area freeway mainline segments.

Metered On-Ramps

No significant direct impacts were calculated on any study area metered on-ramps.

19.1.2 *Cumulative Only Impacts*

Intersections:

- Highway 101 (Camino Del Mar) / Via De La Valle (Border Avenue)

Segments:

No significant impacts were calculated on any study area segments.

Freeway Mainline Segments:

No significant impacts were calculated on any study area freeway mainline segments.

Metered On-Ramps

No significant impacts were calculated on any study area metered on-ramps.

19.2 Mitigation Measures

19.2.1 *Direct and Cumulative Impacts*

Intersections:

- **Via De La Valle / Cedros Avenue**

  Install a traffic signal at the Via De La Valle / Cedros Avenue intersection and hardwire coordinate the signal with the Highway 101 / Via de la Valle intersection. If a signal is installed at this intersection, the significant direct impact will be mitigated to a level below significance.

  A peak hour signal warrant analysis was conducted and is included in Section 19.4. With the addition of Project traffic, the peak hour signal warrant is satisfied during the PM peak hour at this intersection.

  The following optional mitigation measures were also considered:

  1. Install a roundabout control at this intersection. This option was rejected since it would be too close to the Highway 101 / Via de la Valle intersection.

  2. Prohibit the southbound left-turn movement on Cedros Avenue. This option was rejected since westbound to eastbound U-turns are not possible on Via de la Valle at Highway 101.

- **Via De La Valle / Jimmy Durante Boulevard**

  Figure 19-1 depicts the modified striping at this intersection providing the exclusive westbound right-turn lane. As shown on *Figure 19-1*, provide an exclusive westbound right-turn lane at the Via De La Valle / Jimmy Durante Boulevard intersection and a bike lane on westbound Via de la Valle between the right turn lane and the through lane, east of Jimmy Durante Boulevard. With this improvement, the significant direct impact will be mitigated to a level below significance.

- **Camino Del Mar / 27th Street**

  Five (5) optional mitigation measures were evaluated at this intersection. As explained in Section 19.3.1, only the first four options will mitigate the impact.

  1. Install a traffic signal
  2. Install a Roundabout
  3. Provide manual control of the intersection during the peak hours until such time as a permanent mitigation measure is decided.
  4. Provide a second through lane on Camino Del Mar at 27th Street.
  5. Remove the STOP signs on Camino Del Mar and modify the intersection control to a Two-Way STOP-Control (TWSC).

The increase in traffic at this intersection due to the Project is 1.4% in both the AM and PM peak hours. The Project adds a maximum of 14 peak hour trips (total of both directions) during weekday and 15 peak hour trips to this intersection during the weekend, that is the equivalent of one additional car every 4 minutes. The increase in delay due to Project traffic is less than 5 seconds.

- **Camino Del Mar / Coast Boulevard**
  Five (5) optional mitigation measures were evaluated at this intersection. As explained in Section 19.3.1, only the first four options will mitigate the impact.

  1. Install a traffic signal
  2. Install a Roundabout
  3. Provide manual control of the intersection during the peak hours until such time as a permanent mitigation measure is decided.
  4. Provide a second through lane on Camino Del Mar at Coast Boulevard.
  5. Remove the STOP signs on Camino Del Mar and modify the intersection control to a Two-Way STOP-Control (TWSC).

  The increase in traffic at this intersection due to the Project is 1.4% in the AM and 1.3% in the PM peak hour. The Project adds a maximum of 14 peak hour trips (total of both directions) during weekday and 15 peak hour trips to this intersection during the weekend, that is the equivalent of one additional car every 4 minutes. The increase in delay due to Project traffic is less than 5 seconds.

Segments

- **Via De La Valle between Highway 101 and I-5 During Fair**
  With the implementation of the recommended intersection improvements at the Highway 101 (Camino Del Mar) / Via De La Valle (Border Avenue) and the Via De La Valle / Jimmy Durante Boulevard intersections, the flow of traffic on Via De La Valle is improved. Combined with the proposed TDM measures, this impact is partially mitigated during the Fair.

19.2.2 *Cumulative Only Impacts*

- **Highway 101 (Camino Del Mar) / Via De La Valle (Border Avenue)**
  The following optional mitigation measures were considered:

  Option 1

  - EB – Provide 1 exclusive left-turn lane, one through lane and one shared through-right lane
  - Provide a second eastbound through lane on Via De La Valle from Highway 101 for approximately 200 feet east of Cedros Avenue.

Option 2

- EB – Provide 1 exclusive left-turn lane, one through lane and one shared through-right lane
- WB – Restripe Via de la Valle with one right-turn lane, one shared through-left lane and one left-turn lane and install east/west split phasing
- Provide a second eastbound through lane on Via De La Valle from Highway 101 for approximately 200 feet east of Cedros Avenue.

Option 3

- SB – Restripe Highway 101 south with one left-turn lane, one shared through-left lane and one shared through-right lane and install north/south split phasing
- EB – Provide 1 exclusive left-turn lane, one through lane and one shared through-right lane
- Provide a second eastbound through lane on Via De La Valle from Highway 101 through approximately 200 feet east of Cedros Avenue.

With the above Option 3 improvements, this intersection is calculated to operate at LOS F and hence this option was rejected.

Figure 19-2 depicts the recommended Option 1 improvements at this intersection. Option 2 will have a shared westbound through-left lane in place of the westbound through lane in Option 1. With either of these two optional improvements, the impact will be mitigated to a level below significance. The improvements recommended on *Figure 19-2* will require widening of Border Avenue to the south and also result in the loss of 10 parking spaces along the north curb and 5 car and 2 motorcycle spaces along the south curb for a total of 15 parking spaces and 2 motorcycle spaces..

Figure 19-3 depicts the additional eastbound through lane on Via De La Valle from Highway 101 to 200 feet east of Cedros Avenue. This restriping will result in the loss of 13 parking spaces, 9 spaces on the north curb and 4 spaces on the south curb of Via de la Valle, between Highway 101 and Cedros Avenue.

The Project will provide 54 public parking spaces onsite that offset the loss of 28 (15+13) spaces.

19.3 Post Mitigation Analysis

A post mitigation analysis was conducted to determine if the recommended mitigation measures would mitigation the Project related significant direct and cumulative impacts to a level below significance.

19.3.1 *Near Term Direct Impacts*

Tables 19-1, 19-2 and 19-3 summarize the results of the mitigation analysis for the significant direct intersection impacts for a typical weekday / weekend, during the Fair and during the Horse Races,

respectively. It is recommended that the intersections of Camino del Mar / 27th Street and Camino Del Mar / Coast Boulevard be manually controlled during the peak hours. The LOS and delay with signal are reported at these two intersections.

As seen in *Tables 19-1, 19-2 and 19-3*, with the recommended mitigation measures, all intersections are calculated to operate at acceptable LOS D or better. The Via de la Valle / Jimmy Durante Boulevard intersection is calculated to operate at LOS E in the weekday PM peak hour during the Fair. However, the post-mitigation delay with the Project (64.9 seconds) is the same as the without Project condition (64.9 seconds).

As explained previously, five (5) optional mitigation measures are proposed at the Camino Del Mar / 27th Street and Camino Del Mar / Coast Boulevard intersections they are as follows:

1. Signalization
2. A Roundabout
3. Providing manual control of the intersection during the peak hours
4. Providing two through lanes through the intersection and maintaining the All-Way-STOP-Control.
5. Changing the intersection control to a Two-Way STOP-Control with traffic on the minor street (27th Street and Coast Boulevard) being stopped.

As seen in the tables, the Camino Del Mar / 27th Street and Camino Del Mar / Coast Boulevard intersections are calculated to operate at an acceptable LOS D or better with all optional mitigation measures, except the fifth (TWSC).

Based on the above, if the mitigation measures are implemented, all significant direct intersection impacts are mitigated to a level below significance. As explained in Section 16.2.1, the segment impact on Via de la Valle between Highway 101 and I-5 during the Fair is partially mitigated with the improvements at Highway 101 (Camino Del Mar) / Via De La Valle (Border Avenue) and the Via De La Valle / Jimmy Durante Boulevard intersections. ***Appendix T-1*** contains the mitigation analysis worksheets for the significant direct impacts.

19.3.2 *Near-Term Cumulative Impacts*

Tables 19-4, 18-5 and 19-6 summarize the results of the mitigation analysis for the significant cumulative intersection impacts under the Existing + Project + Cumulative projects condition for a typical weekday / weekend, during the Fair and during the Horse Races, respectively. As in the case of the mitigation for Existing + Project condition, optional mitigation measures are analyzed at the Camino del Mar / 27th Street and Camino del Mar / Coast Boulevard intersections.

As seen in *Tables 19-4, 19-5 and 19-6*, with the recommended mitigation measures, all intersections are calculated to operate at acceptable LOS D or better except the Via de la Valle / Jimmy Durante Boulevard intersection during the weekday PM during the Fair. However, the post-mitigation delay

with the Project (82.7 seconds) is less than the without Project condition (84.4 seconds, *Table 10-4*). Hence, all the significant direct impacts at the intersections are mitigated to a level below significance.

Five (5) optional mitigation measures are proposed at the Camino Del Mar / 27th Street and Camino Del Mar / Coast Boulevard intersections. As seen in the following tables, with the Project traffic, the Camino Del Mar / 27th Street and Camino Del Mar / Coast Boulevard intersections are calculated to operate at an acceptable LOS D or better with all optional mitigation measures, except the fifth (TWSC).

As explained in Section 19.2.1, the segment impact on Via de la Valle between Highway 101 and I-5 during the Fair is partially mitigated with the improvements at Highway 101 (Camino Del Mar) / Via De La Valle (Border Avenue) and the Via De La Valle / Jimmy Durante Boulevard intersections.

Appendix T-2 contains the mitigation analysis worksheets for the Near-Term significant cumulative impacts.

TABLE 19–1
EXISTING + PROJECT INTERSECTION MITIGATION ANALYSIS – TYPICAL WEEKDAY / WEEKEND

Intersection	Traffic Control [a]	Peak Hour	Pre-Mitigation [b]		Post-Mitigation [c]	
			Delay	LOS	Delay	LOS
9. Via de la Valle / Cedros Ave	**Signal**	WkDay PM	36.5	E	18.6	B
13. Camino del Mar / 27th St						
Option 1	**Signal**	WkEnd PM	36.2	E	10.4	B
Option 2	**Roundabout**		36.2	E	7.7	A
Option 3	**Manual Control [d]**		36.2	E	10.6	B
Option 4	**2 through lanes**		36.2	E	13.8	B
Option 5	**MSSC**		36.2	E	33.4	D
14. Camino del Mar / Coast Blvd						
Option 2	**Signal**	WkEnd PM	65.4	F	7.6	A
Option 3	**Roundabout**		65.4	F	7.9	A
Option 4	**Manual Control [d]**		65.4	F	6.6	A
Option 5	**2 through lanes**		65.4	F	16.7	C
Option 2	**MSSC**		65.4	F	37.1	E

Footnotes:
a. Mitigated traffic control shown in **Bold**.
b. Delay and level of service with Project traffic, prior to the implementation of mitigation.
c. Delay and level of service with Project traffic and mitigation.
d. Intersection will be essentially function as a signal with manual control during the peak hours.

TABLE 19–2
EXISTING + PROJECT INTERSECTION MITIGATION ANALYSIS – FAIR

Intersection	Traffic Control [a]	Peak Hour	Pre-Mitigation [b]		Post-Mitigation [c]	
			Delay	LOS	Delay	LOS
10. Via de la Valle / Jimmy Durante Blvd	**Signal** [d]	WkDay PM	67.2	E	64.9	E
		WkEnd PM	89.7	F	53.7	D
13. Camino del Mar / 27th St						
Option 1	**Signal**	WkDay PM	67.2	E	8.8	A
Option 2	**Roundabout**		67.2	E	8.9	A
Option 3	**Manual Control** [d]		67.2	E	8.8	A
Option 4	**2 through lanes**		67.2	E	17.4	C
Option 5	**MSSC**		67.2	E	53.4	F
Option 1	**Signal**	WkEnd PM	89.7	F	10.3	B
Option 2	**Roundabout**		89.7	F	8.2	A
Option 3	**Manual Control** [d]		89.7	F	10.3	B
Option 4	**2 through lanes**		89.7	F	14.8	B
Option 5	**MSSC**		89.7	F	33.6	D
14. Camino del Mar / Coast Blvd						
Option 1	**Signal**	WkDay PM	97.4	F	14.4	B
Option 2	**Roundabout**		97.4	F	9.2	A
Option 3	**Manual Control** [d]		97.4	F	14.4	B
Option 4	**2 through lanes**		97.4	F	25.9	D
Option 5	**MSSC**		97.4	F	>100.0	F

Footnotes:

a. Mitigated traffic control shown in **Bold**.
b. Delay and level of service with Project traffic, prior to the implementation of mitigation.
c. Delay and level of service with Project traffic and mitigation.
d. Intersection will be essentially function as a signal with manual control during the peak hours.

TABLE 19–3
EXISTING + PROJECT INTERSECTION MITIGATION ANALYSIS – HORSE RACES

Intersection	Traffic Control [a]	Peak Hour	Pre-Mitigation [b]		Post-Mitigation [c]	
			Delay	LOS	Delay	LOS
9. Via de la Valle / Cedros Ave	**Signal**	WkDay PM	35.6	E	19.8	B
13. Camino del Mar / 27th St						
Option 1	**Signal**	WkDay PM	139.3	F	9.4	A
Option 2	**Roundabout**		139.3	F	11.0	B
Option 3	**Manual Control [d]**		139.3	F	9.4	A
Option 4	**2 through lanes**		139.3	F	31.5	D
Option 5	**MSSC**		139.3	F	95.2	F
14. Camino del Mar / Coast Blvd						
Option 1	**Signal**	WkDay PM	262.4	F	17.4	B
Option 2	**Roundabout**		262.4	F	17.3	C
Option 3	**Manual Control [d]**		262.4	F	17.4	B
Option 4	**2 through lanes**		262.4	F	81.1	F
Option 5	**MSSC**		262.4	F	>300.0	F
Option 1	**Signal**	WkEnd PM	92.9	F	8.8	A
Option 2	**Roundabout**		92.9	F	8.1	A
Option 3	**Manual Control [d]**		92.9	F	8.8	A
Option 4	**2 through lanes**		92.9	F	18.5	C
Option 5	**MSSC**		92.9	F	>100.0	F

Footnotes:
a. Mitigated traffic control shown in **Bold**.
b. Delay and level of service with Project traffic, prior to the implementation of mitigation.
c. Delay and level of service with Project traffic and mitigation.
d. Intersection will be essentially function as a signal with manual control during the peak hours.

TABLE 19–4
EXISTING + PROJECT + CUMULATIVE PROJECTS INTERSECTION MITIGATION ANALYSIS – TYPICAL WEEKDAY / WEEKEND

Intersection	Traffic Control [a]	Peak Hour	Pre-Mitigation [b]		Post-Mitigation [c]	
			Delay	LOS	Delay	LOS
9. Via de la Valle / Cedros Ave	**Signal**	WkDay PM	48.5	F	21.8	C
10. Via de la Valle / Jimmy Durante Blvd	Signal	WkDay PM	57.1	E	42.8	D
13. Camino del Mar / 27th St						
Option 1	**Signal**	WkEnd PM	52.5	F	7.9	A
Option 2	**Roundabout**		52.5	F	8.4	A
Option 3	**Manual Control [d]**		52.5	F	7.9	A
Option 4	**2 through lanes**		52.5	F	15.5	C
Option 5	**MSSC**		52.5	F	39.0	E
14. Camino del Mar / Coast Blvd						
Option 1	**Signal**	WKDay PM	84.9	F	11.3	B
Option 2	**Roundabout**		84.9	F	8.4	A
Option 3	**Manual Control [d]**		84.9	F	11.3	B
Option 4	**2 through lanes**		84.9	F	19.4	C
Option 5	**MSSC**		84.9	F	52.1	F
Option 1	**Signal**	WkEnd PM	45.9	E	33.3	C
Option 2	**Roundabout**		45.9	E	8.2	A
Option 3	**Manual Control [d]**		45.9	E	33.3	C
Option 4	**2 through lanes**		45.9	E	18.2	C
Option 5	**MSSC**		45.9	E	>100.0	F

Footnotes:

a. Mitigated traffic control shown in **Bold**.
b. Delay and level of service with Project traffic, prior to the implementation of mitigation.
c. Delay and level of service with Project traffic and mitigation.
d. Intersection will be essentially function as a signal with manual control during the peak hours.

TABLE 19–5
EXISTING + PROJECT + CUMULATIVE PROJECTS INTERSECTION MITIGATION ANALYSIS – FAIR

Intersection	Traffic Control [a]	Peak Hour	Pre-Mitigation [b]		Post-Mitigation [c]	
			Delay	LOS	Delay	LOS
9. Via de la Valle / Jimmy Durante Blvd	Signal	WkDay PM	87.4	F	82.7	F
	Signal	WkEnd PM	112.0	F	68.7	E
13. Camino del Mar / 27th St						
Option 1	**Signal**	WkDay PM	93.4	F	9.6	A
Option 2	**Roundabout**		93.4	F	9.6	A
Option 3	**Manual Control [d]**		93.4	F	9.6	A
Option 4	**2 through lanes**		93.4	F	21.1	C
Option 5	**MSSC**		93.4	F	67.2	F
Option 1	**Signal**	WkEnd PM	68.0	E	10.7	B
Option 2	**Roundabout**		68.0	E	8.6	A
Option 3	**Manual Control [d]**		68.0	E	10.7	B
Option 4	**2 through lanes**		68.0	E	16.8	C
Option 5	**MSSC**		68.0	E	39.0	E
14. Camino del Mar / Coast Blvd						
Option 1	**Signal**	WkDay PM	119.7	F	12.3	B
Option 2	**Roundabout**		119.7	F	10.0	B
Option 3	**Manual Control [d]**		119.7	F	12.3	B
Option 4	**2 through lanes**		119.7	F	32.7	D
Option 5	**MSSC**		119.7	F	>100.0	F
Option 1	**Signal**	WkEnd PM	56.3	E	15.0	B
Option 2	**Roundabout**		56.3	E	8.9	A
Option 3	**Manual Control [d]**		56.3	E	15.0	B
Option 4	**2 through lanes**		56.3	E	18.3	C
Option 5	**MSSC**		56.3	E	>100.0	F

Footnotes:
a. Mitigated traffic control shown in **Bold**.
b. Delay and level of service with Project traffic, prior to the implementation of mitigation.
c. Delay and level of service with Project traffic and mitigation.
d. Intersection will be essentially function as a signal with manual control during the peak hours.

TABLE 19–6
EXISTING + PROJECT + CUMULATIVE PROJECTS INTERSECTION MITIGATION ANALYSIS – HORSE RACES

Intersection	Traffic Control [a]	Peak Hour	Pre-Mitigation [b]		Post-Mitigation [c]	
			Delay	LOS	Delay	LOS
9. Via de la Valle / Cedros Ave	**Signal**	WkDay PM	48.1	E	13.3	B
13. Camino del Mar / 27th St						
Option 1	**Signal**	WkDay PM	169.4	F	9.8	A
Option 2	**Roundabout**		169.4	F	12.2	B
Option 3	**Manual Control [d]**		169.4	F	9.8	A
Option 4	**2 through lanes**		169.4	F	40.7	E
Option 5	**MSSC**		169.4	F	121.7	F
Option 1	**Signal**	WkEnd PM	43.7	E	12.5	B
Option 2	**Roundabout**		43.7	E	8.1	A
Option 3	**Manual Control [d]**		43.7	E	12.5	B
Option 4	**2 through lanes**		43.7	E	14.8	B
Option 5	**MSSC**		43.7	E	33.2	D
14. Camino del Mar / Coast Blvd						
Option 1	**Signal**	WkDay PM	290.0	F	17.2	B
Option 2	**Roundabout**		290.0	F	20.5	C
Option 3	**Manual Control [d]**		290.0	F	17.2	B
Option 4	**2 through lanes**		290.0	F	96.6	F
Option 5	**MSSC**		290.0	F	>300.0	F
Option 1	**Signal**	WkEnd PM	117.2	F	14.4	B
Option 2	**Roundabout**		117.2	F	8.8	A
Option 3	**Manual Control [d]**		117.2	F	14.4	B
Option 4	**2 through lanes**		117.2	F	21.4	C
Option 5	**MSSC**		117.2	F	43.0	E

Footnotes:
a. Mitigated traffic control shown in **Bold**.
b. Delay and level of service with Project traffic, prior to the implementation of mitigation.
c. Delay and level of service with Project traffic and mitigation.
d. Intersection will be essentially function as a signal with manual control during the peak hours.

19.3.3 *Long-Term Cumulative Impacts*

Table 19-7 summarizes the results of the mitigation analysis for the significant long-term intersection impacts. At the intersections of Highway 101 / Via de la Valle, Camino del Mar / 27th Avenue and Camino del Mar / Coast Boulevard, optional mitigation measures are analyzed. At the Highway 101 (Camino del Mar) / Via de la Valle (Border Avenue) intersection the two mitigation options are optional geometry improvements. Option 1 mitigation measure consists of widening eastbound Border Avenue to provide an exclusive left-turn lane, one through lane and one shared through-right lane in the eastbound direction. Option 2 mitigation measures includes restriping westbound Via de la Valle with one right-turn lane, one shared through-left lane and one left-turn lane with east/west split phasing in addition to the Option 1 improvements.

As seen in *Table 19-7*, with the implementation of the recommended mitigation measures, all intersections are calculated to operate at acceptable LOS D or better except the Via de la Valle / Jimmy Durante Boulevard intersection during the weekday PM during the Fair. However, the post-mitigation delay with the Project (57.5 / 63.0 seconds during the AM / PM peak hours) is less than the pre-mitigation without Project condition (59.5 / 75.9 seconds during the AM / PM peak hours).

Hence, all the significant cumulative impacts at the intersections are mitigated to a level below significance.

Five (5) optional mitigation measures are proposed at the Camino Del Mar / 27th Street and Camino Del Mar / Coast Boulevard intersections. As seen in the *Table 19-7*, with the addition of Project traffic, the two intersections are calculated to operate at LOS D or better with all optional mitigation measures. The Camino Del Mar / Coast Boulevard intersection is calculated to operate at LOS E with the fifth (TWSC) option.

As explained in Section 19.2.1, the segment impact on Via de la Valle between Highway 101 and I-5 during the Fair is partially mitigated with the improvements at Highway 101 (Camino Del Mar) / Via De La Valle (Border Avenue) and the Via De La Valle / Jimmy Durante Boulevard intersections.

Appendix T-3 contains the mitigation analysis worksheets for the Long-Term significant cumulative impacts.

TABLE 19–7
LONG-TERM MITIGATION ANALYSIS - INTERSECTIONS

Intersection	Traffic Control [a]	Peak Hour	Without Project		With Project		With Project and With Mitigation	
			Delay	LOS	Delay	LOS	Delay	LOS
8. Hwy 101 (Camino del Mar) / Via de la Valle (Border Ave)	**Option 1 Geometry**	WkDay PM	60.6	E	63.9	E	48.3	D
	Option 2 Geometry	WkDay PM	60.6	E	63.9	E	58.5	E
9. Via de la Valle / Cedros Ave	**Signal**	WkDay AM	50.4	F	58.7	F	9.6	A
		WkDay PM	130.2	F	159.1	F	30.6	C
10. Via de la Valle / Jimmy Durante Blvd	Signal	WkDay AM	59.5	E	62.0	E	58.5	E
		WkDay PM	75.9	E	79.2	E	64.4	E
13. Camino del Mar / 27th St								
Option 1	**Signal**	WkDay PM	45.5	E	47.8	E	7.5	A
Option 2	**Roundabout**	WkDay PM	45.5	E	47.8	E	8.0	A
Option 3	**Manual Control [d]**	WkDay PM	45.5	E	47.8	E	7.5	A
Option 4	**2 through lanes**	WkDay PM	45.5	E	47.8	E	14.1	B
Option 5	**MSSC**	WkDay PM	45.5	E	47.8	E	26.3	D
14. Camino del Mar / Coast Blvd								
Option 1	**Signal**	WkDay PM	103.5	F	107.4	F	9.9	A
Option 2	**Roundabout**	WkDay PM	103.5	F	107.4	F	9.2	A
Option 3	**Manual Control [d]**	WkDay PM	103.5	F	107.4	F	9.9	A
Option 4	**2 through lanes**	WkDay PM	103.5	F	107.4	F	22.9	C
Option 5	**MSSC**	WkDay PM	103.5	F	107.4	F	64.4	F

Footnotes:

a. Mitigated traffic control shown in **Bold**.

b. Delay and level of service with Project traffic, prior to the implementation of mitigation.

c. Delay and level of service with Project traffic and mitigation.

d. Intersection will be essentially function as a signal with manual control during the peak hours.

19.4 Signal Warrant Analysis

A peak hour signal warrant analysis was conducted for the Via de la Valle / Cedros Avenue, Camino Del Mar / 27th Street and the Camino Del Mar / Coast Boulevard intersections for which traffic signals are recommended as the mitigation measure.

The following assumptions are made in determining the conditions at the subject intersection:

- *Approach Lanes* – One right-turn lane and one left-turn lane will be provided in the southbound direction.

  Page 847 of the California Manual On Uniform Traffic Control Devices (MUTCD) 2014 Edition states "*for an approach with one lane for through and right-turning traffic plus a left-turn lane, if engineering judgment indicates that it should be considered a one-lane approach because the traffic using the left-turn lane is minor, the total traffic volume approaching the intersection should be applied against the signal warrants as a one-lane approach. The approach should be considered two lanes if approximately half of the traffic on the approach turns left and the left-turn lane is of sufficient length to accommodate all left-turn vehicles."*
- *Approach Volumes* – As stated in the MUTCD, "engineering judgment and rationale should be applied to a street approach with one through/left-turn lane plus a right-turn lane. In this case, the degree of conflict of minor-street right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic volume in the through/left-turn lane considered."

The peak hour signal warrant analysis for the three intersections are included in the following pages.

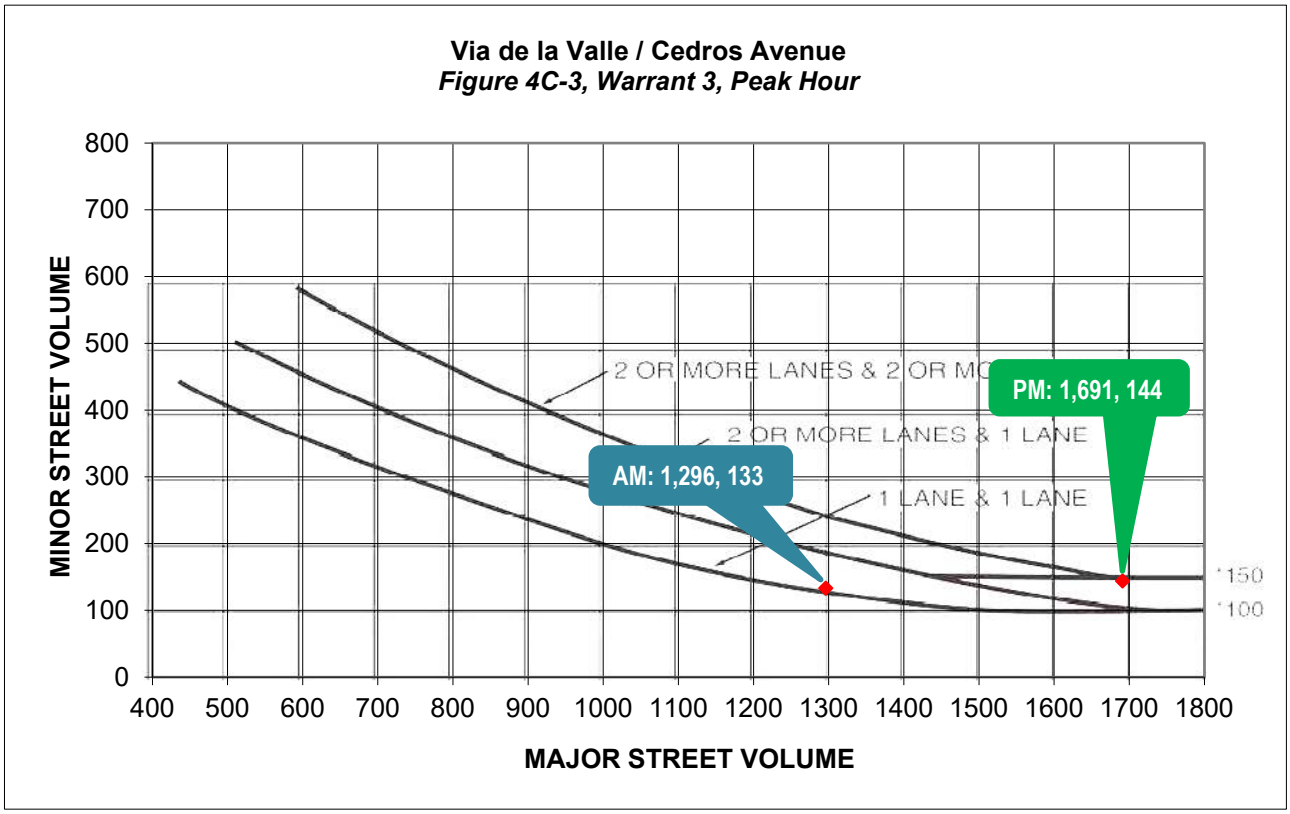
19.4.1 *Via de la Valle / Cedros Avenue*

This intersection is impacted in the Existing + Project condition. Hence, the signal warrants analysis was conducted using Existing + Project volumes. The following assumptions are made:

- At this location, Cedros Avenue is a two-lane road (one lane in each direction) with dedicated left-turn and right-turn lanes at the intersection and it is not considered to be possible for traffic to enter Via de la Valle from Cedros Avenue with "minimal conflict". The storage in the left-turn lane will not be sufficient to accommodate the entire left-turning traffic. Hence, this approach will function and is analyzed as a one lane approach.
- As described above, a right-turn lane and a left-turn lane is provided on southbound Cedros Avenue at Via de la Valle. Based on the number of approach lanes and the MUTCD (previous bullet item), a 25% reduction in right-turning traffic is assumed since this is considered a one-lane approach (see above) and right-turning traffic has to enter a busy 2-Lane road that functions as one of the main arterials in both the Del Mar and Solana Beach communities. The recorded speed on Via de la Valle at this location is just under 40 mph.

Chart 1 below, depicts the Peak hour warrant plot for the Via de la Valle / Cedros Avenue intersection. As seen in the plot, the warrant is satisfied in the AM peak hour where the plot point falls on the curve and in the PM peak hour where the plot point falls above the curve. A simulation of the operations conducted for the Via de la Valle corridor indicates that this mitigation will result in a good traffic flow on Via de la Valle between Cedros Avenue and Border Avenue.

CHART 1



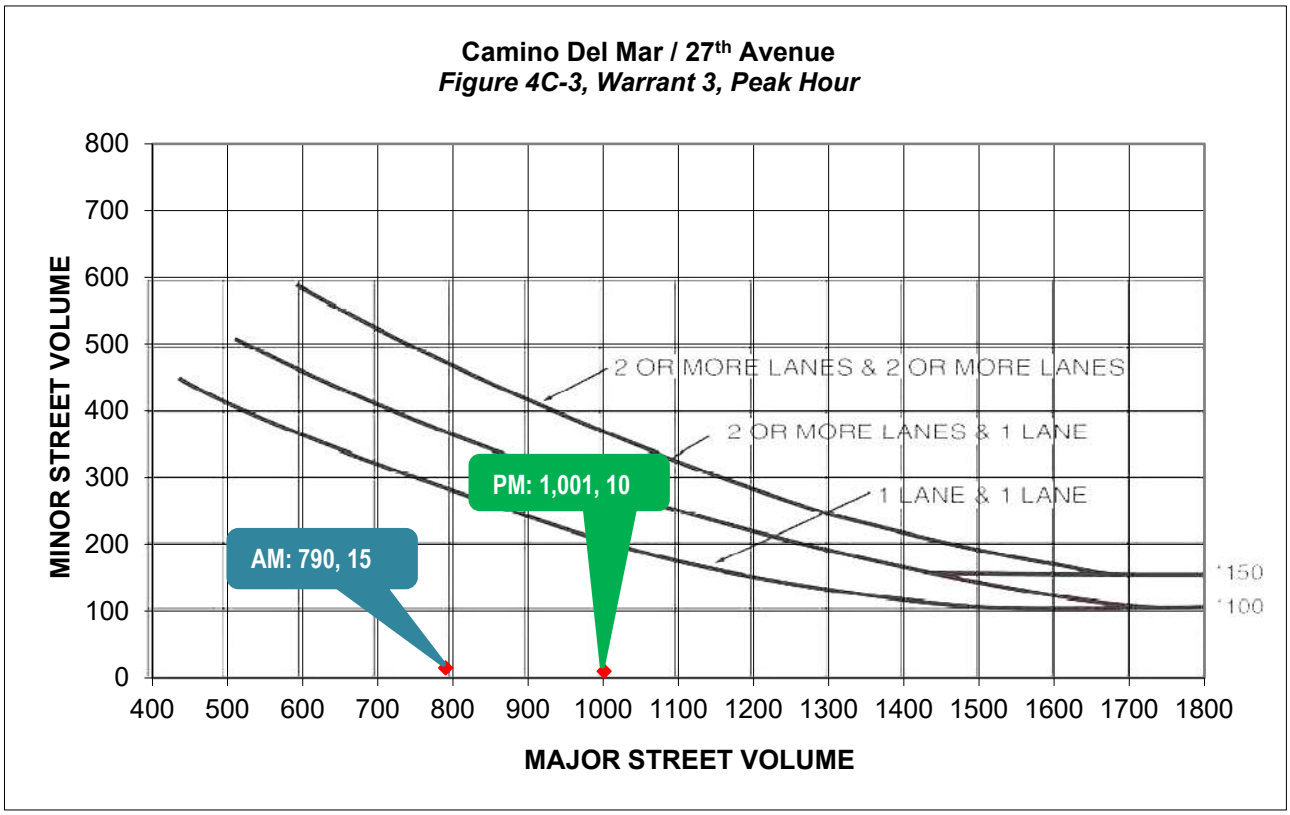
19.4.2 *Camino Del Mar / 27th Street*

This intersection is impacted in the Existing + Project condition. Hence, the signal warrants analysis was conducted using Existing + Project volumes. The following assumptions are made:

- At this location, 27th Street is a two-lane road (one lane in each direction) and Camino del Mar is also a two-lane road with one lane in each direction. The approaches on 27th Street will function and is analyzed as a one lane approach.
- As described above, a single lane approach is provided on eastbound and westbound 27th Street at Camino Del Mar. Based on the number of approach lanes and the MUTCD (previous bullet item), no reduction in right-turning traffic is assumed since this is considered a one-lane approach (see above).

Chart 2 below, depicts the peak hour warrant plot. As seen in the plot, the plotted points fall far below the curve for both the AM and PM peak hours and hence, the warrant is not satisfied in either the AM or the PM peak hours.

CHART 2



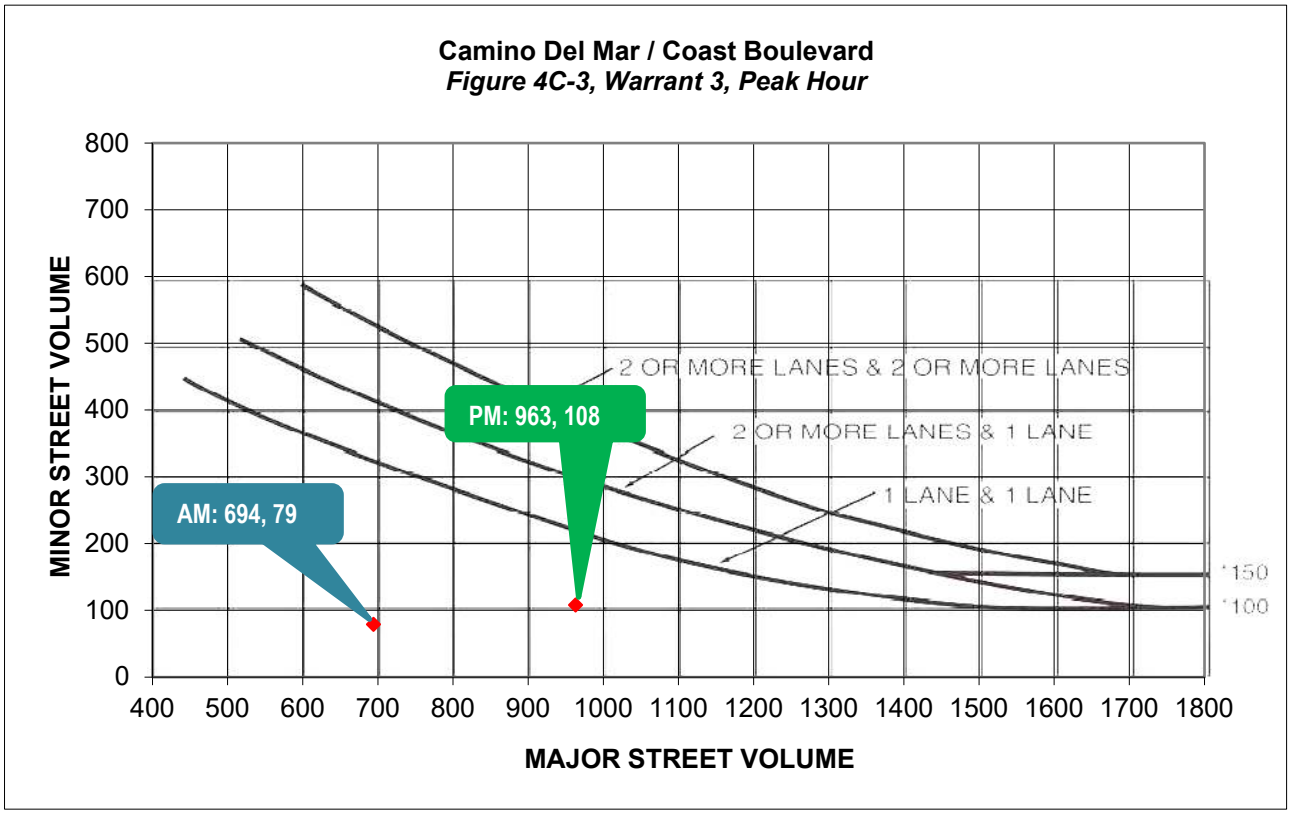
19.4.3 *Camino Del Mar / Coast Boulevard*

This intersection is impacted in the Existing + Project condition. Hence, the signal warrants analysis was conducted using Existing + Project volumes. The following assumptions are made:

- At this location, Coast Boulevard is a two-lane road (one lane in each direction) and Camino del Mar is also a two-lane road with one lane in each direction. The approaches on 27th Street will function and is analyzed as a one lane approach.
- As described above, a single lane approach is provided on eastbound and westbound 27th Street at Camino Del Mar. Based on the number of approach lanes and the MUTCD (previous bullet item), no reduction in right-turning traffic is assumed since this is considered a one-lane approach (see above).

Chart 3 below, depicts the peak hour warrant plot. As seen in the plot, the plotted points fall far below the curve for both the AM and PM peak hours and hence, the warrant is not satisfied in either the AM or the PM peak hours.

CHART 3



19.5 Queuing at Highway 101 / Via de la Valle

Tables 19-8 and 19-9 summarize the future queuing analysis with the mitigation measures at the Highway 101 / Via de La Valle and the Via de La Valle / Jimmy Durante Boulevard intersections, respectively.

19.5.1 *Highway 101 / Via de la Valle Intersection*

As seen in the queuing analysis in *Table 9-6,* the existing queue (282 feet) in the westbound left turn movement exceeds the available storage (120 feet). As mentioned previously, the following two Optional mitigation measures are proposed:

Option 1

- Eastbound – 1 exclusive left-turn lane, one through lane and one shared through-right lane

Option 2

- Eastbound – 1 exclusive left-turn lane, one through lane and one shared through-right lane
- Westbound – Via de la Valle with one right-turn lane, one shared through-left lane and one left-turn lane with east/west split phasing

With the addition of project traffic, the queue is estimated to increase to 309 feet, approximately 2 vehicle lengths more than existing. With the Option 1 mitigation, the queue will reduce to 302 feet, almost the same as without the mitigation. With the Option 2 mitigation, the queue will reduce to 246 feet or, approximately 1 vehicle length *less* than existing.

TABLE 19–8
QUEUING ANALYSIS: HIGHWAY 101 / VIA DE LA VALLE – PM PEAK HOUR

Movement	Available Storage Length (Feet)	Existing	Existing + Project		
			Pre-Mitigation	Post- Mitigation Option 1	Post- Mitigation Option 2
WB Left	120	#282	#309	#302	246

Footnote:

– 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is maximum after two cycles.

19.5.2 *Via de la Valle / Jimmy Durante Boulevard Intersection*

As seen in the queuing analysis in Table 9-6, the existing queue (555 feet) in the westbound through movement exceeds the available storage (550 feet). In the Year 2035 with the Project traffic, the queue in the westbound through movement increases to 731 feet. As mentioned previously, installing a westbound right-turn lane is recommended at this intersection. As seen in ***Table 19-9***, with the recommended mitigation measure, the calculated queue length reduces to 370 feet, less than the available storage. ***Appendix R-4*** contains the queuing analysis worksheets.

TABLE 19–9
QUEUING ANALYSIS: VIA DE LA VALLE / JIMMY DURANTE BOULEVARD – AM PEAK HOUR

Movement	Available Storage Length (Feet)	Existing	Year 2035 without Project	Year 2035 + Project	
				Pre-Mitigation	Post- Mitigation
WB Through	550	555	#668	#731	370

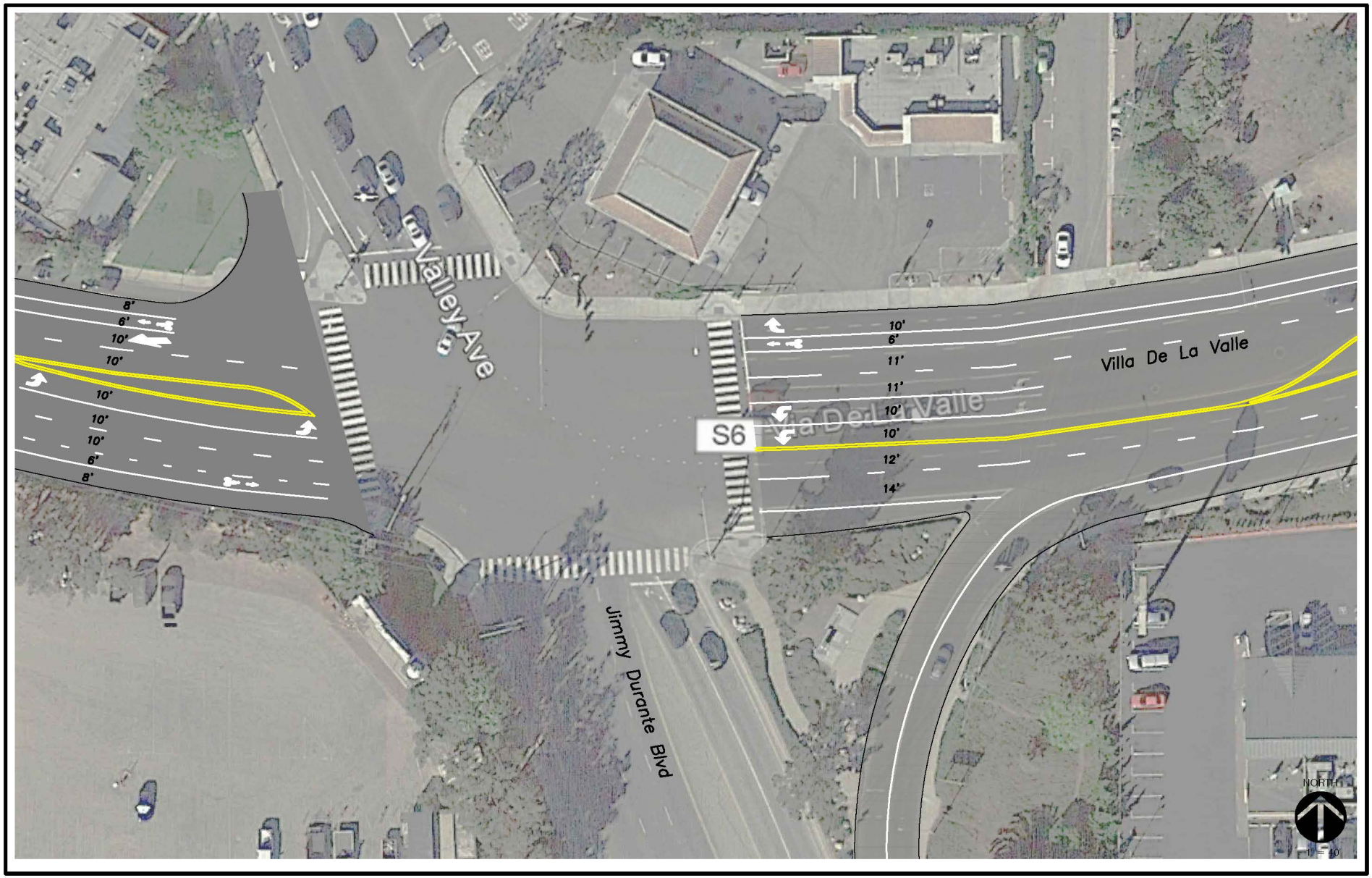
Footnote:

– 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is maximum after two cycles.

Figure 19–1 Via De La Valle / Jimmy Durante Boulevard Intersection Improvements

Figure 19–2 Via De La Valle (Border Avenue) / Highway 101 (Camino Del Mar) Intersection Improvements

Figure 19–3 Proposed Conceptual Plan - Via De La Valle Two Through Lanes from Highway 101 to 400’ east of Cedros Avenue



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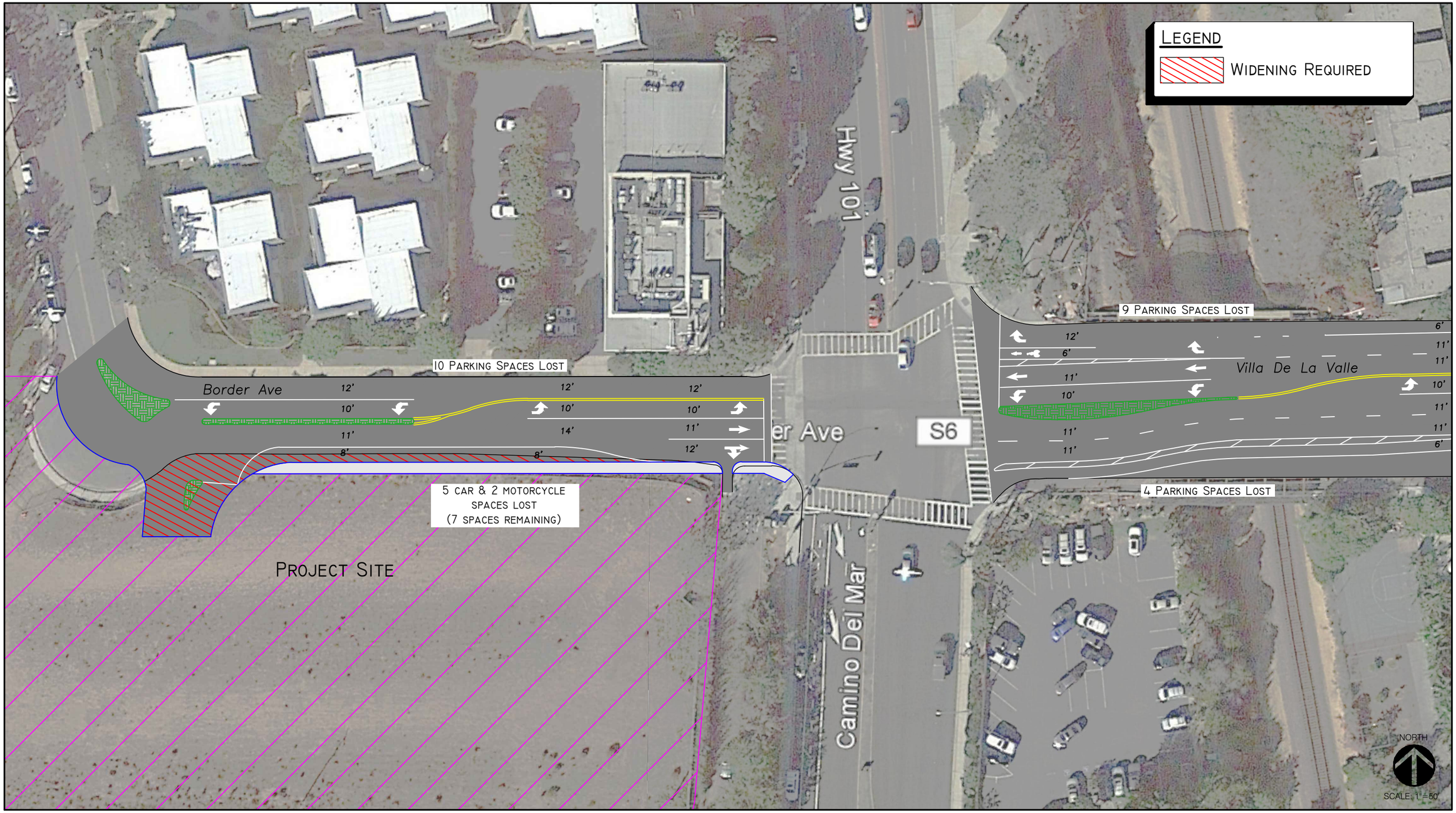
Date: 06/24/19

Figure 19-1

Via De La Valle / Jimmy Durante Boulevard Intersection Improvements

DEL MAR RESORT



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\\lgsvrad5\project\2754\CAD\LLG2754-FIG 1 Concept (Oct 2019 Submittal).dwg

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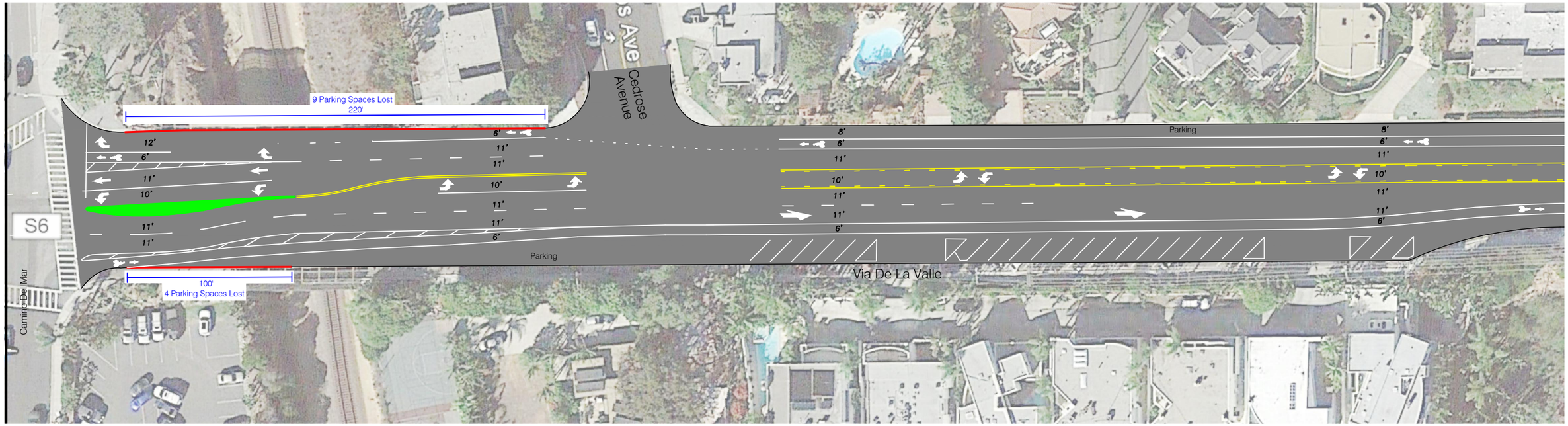
Figure 19-2

Via De La Valle (Border Avenue) / Highway 101 (camino Del Mar) Intersection Improvements

MARISOL



LEGEND

Edge of Pavement

No Parking

NORTH

SCALE: 1"=60'

NOTE: Total of 13 parking spaces lost.

REV. 11/4/2019
N:\2754\CAD\LLG2754-FIG 8 Alternative 2 with 200' two through lanes.dwg

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Figure 19-3

Proposed Conceptual Plan - Via De La Valle
Two Through Lanes from Highway 101 to 200' east of Cedros Avenue

DEL MAR RESORT